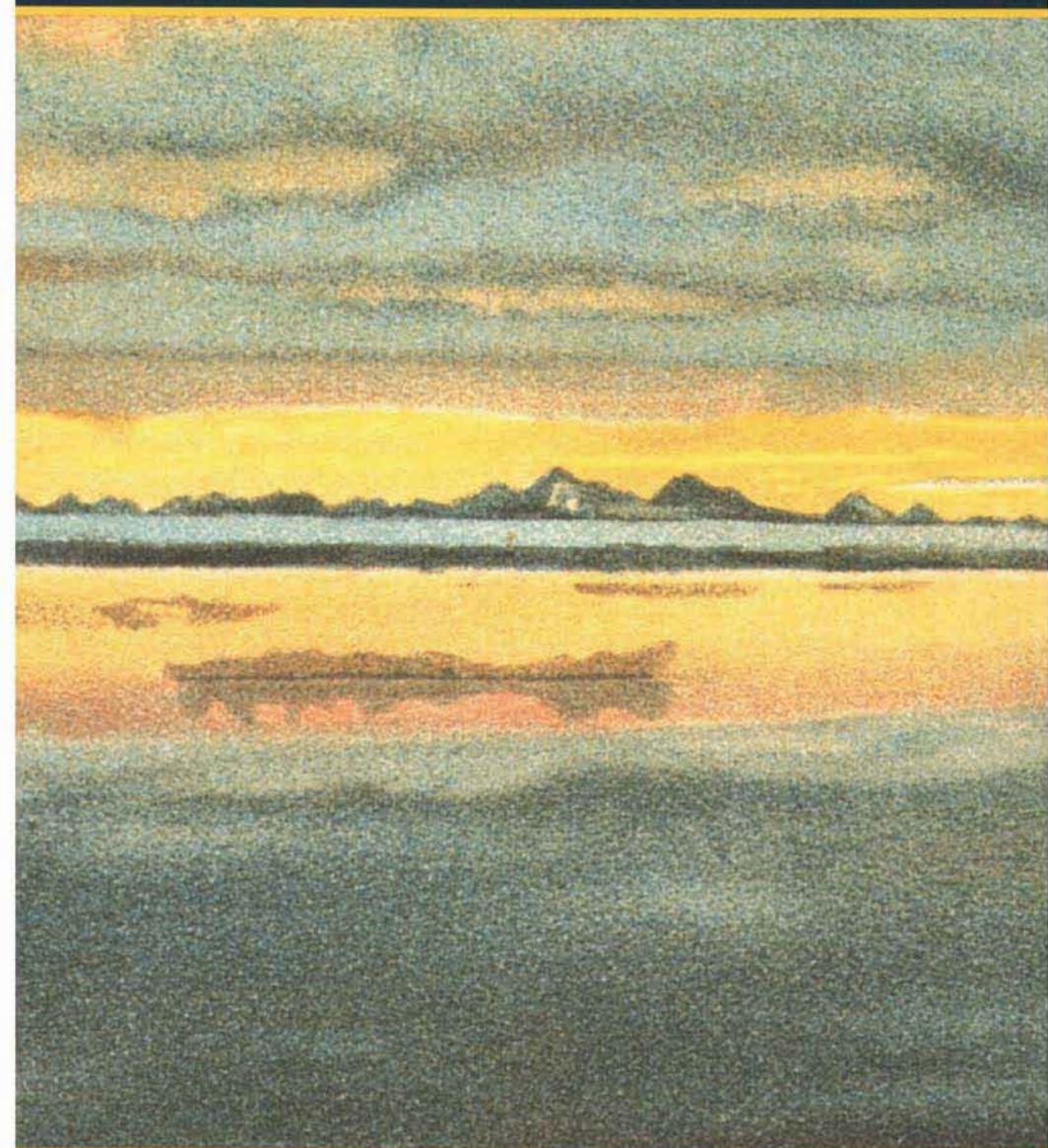


The 5th World Wilderness Congress

ARCTIC WILDERNESS



Introductory Essay by Thor Heyerdahl

Vance G. Martin and Nicholas Tyler

ARCTIC WILDERNESS



The 5th World Wilderness Congress

Vance G. Martin and Nicholas Tyler



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FOREWORD

The World Wilderness Congress (WWC) is a permanent, international, public forum at which a diverse group of professionals gathers with concerned members of the public to address and act on critical matters of environmental well-being, especially as they relate to the role of wilderness in our society. The congress has convened on four previous occasions—South Africa (1977), Australia (1980), Scotland (1983), and the United States (1987).

The 5th WWC convened in Tromsø, Norway, north of the Arctic Circle, under the theme *Wild Nature and Sustainable Living in Circumpolar Regions*. The aim of the 5th WWC was to enhance awareness of the natural beauty, natural resources, and the aesthetic and scientific importance of the Arctic and Antarctica—the two largest, continuous, relatively undisturbed ecosystems on Earth. A greater physical contrast between these regions and the woodlands of Umfolozi where the WWC was conceived (see Preface) could hardly be imagined. But the inherent value of natural environment and the conservation imperative that must be upheld in these and all wild regions of the Earth are exactly the same.

The WWC has always insisted on a balanced, holistic approach to problem solving in which philosophy, culture, and the arts are as important as the biological and physical sciences, economics, and politics. In this spirit, the fifth congress was convened in parallel with the first Northern Forum conference, the theme of which was *People in the Arctic: Regional Rights and Regional Management*. This cooperation was a new initiative, which provided an opportunity to present and discuss major issues in conservation and sustainable development in northern regions from an especially wide

range of perspectives. Dialogue of this kind is essential as never before to secure both preservation of polar wilderness and sustainable living for the people of the North.

How well this experiment succeeded you can judge from the quality and diversity of the material in this volume. The papers report what was said; the “Resolutions of the 5th World Wilderness Congress,” which for the first time are included in the proceedings in full, report what we want done. Copies of the resolutions have been distributed to the heads of regional governments throughout the northern regions, both Arctic and sub-Arctic. It is my sincere hope that the resolutions be carefully considered, and that they will strongly influence future policy in government of the North.

—*Rakel Surlien*
Chairman, 5th WWC Governing Board
Oslo, Norway
June 1994



PREFACE

The day was hot and they had walked many miles through the thornfeld wilderness of Zululand's Umfolozi Game Reserve. As the sun dipped below the horizon they sat on the bank of the Black Umfolozi River watching the impala and zebra drink, listening to the evening song of the emerald spotted wood-dove. It was 1974 and, after seventy years of living and working with the wildlife of Zululand, Game Guard Magqubu Ntombela saw the wilderness and wildlife under increasing and serious threat. Something must be done.

Speaking in the only language he knew, his native Zulu, Magqubu said to his friend and colleague, Ian Player, that the people must come together. "An *indabakulu* [great gathering] is needed," he asserted, "so all the people can know the danger and work together to save the wildlife and wilderness." They continued to speak into the night, around the campfire. The seed was planted.

Ian knew that the plea from the old man to help his Zululand wilderness was also a need around the world. The planning commenced. Fighting both the internal South African laws of apartheid and the international opposition to anything South African, Ian persisted. After three years of meetings, international networking, and fundraising, the 1st World Wilderness Congress (WWC) met with great success in Johannesburg in 1977.

In the process, a new model of inquiry and action was established. In planning the 1st WWC, Ian drew from the pattern of diversity found in the wilderness and the concept of *holism*, espoused by Jan Smuts, to do what at

that time was unthinkable. He expanded professional nature conservation, wilderness awareness, and conservation policy beyond the domain of scientists and wildlife managers, and included all people and professions in the debate. He charged them with *listening* to each other while still arguing their individual points in order to arrive at cooperative solutions to protect wilderness for all people. Bankers, businessmen, scientists, politicians, managers, artists, teachers, tribal peoples, and religious leaders—all were invited, and all participated. The seed sprouted.

The Australian delegation at the 1st WWC liked what they saw and knew it could be important for them. And thus the WWC continued in Australia (1980), Scotland (1983), the United States (1987), and Norway (1993). Under the guidance of the International Wilderness Leadership (WILD) Foundation and our advisors and colleagues around the world, the congress is less of an institution than an ongoing process. It meets at the request of concerned citizens or organizations of a particular country to respond to specific global and regional needs.

What is it about wilderness that draws together such different people in such radically different places, from the southern, warm grasslands of Africa to the northern tundra and iceflows of Norway? Three things come to mind:

- Wilderness is our home—it is the single factor held in common within the “body memory” of all people. The human species was created—and it competed, adapted, and evolved—in wilderness over a period of millions of years.
- Wilderness is still our teacher—as it shaped us so can it still guide us. The way in which wilderness works—in cycles of growth and consolidation, interdependence, and natural efficiency—is life’s best template. We have only to pay attention, show respect, and take heed of what it shows us.
- Wilderness is the future—it is an essential ingredient in a healthy and sane world. As we scheme, struggle, and stress, wilderness continues in its own rhythm. Indeed, by living with wilderness we can both address our fear of the dark and brooding forest of years past, as well as understand how to survive as a human species in an increasingly uncertain future.

Much has changed in the twenty years since Magqubu and Ian discussed the need for a wilderness *indabakulu* while sitting on the bank of the Black Umfolozi River. In South Africa, the shackles of apartheid are gone and a new country is arising. Communism has fallen, replaced with a shaky

but hopeful path toward democracy in many countries. Magqubu, too, is gone, but his spirit enlivens our wilderness work.

However, a constant that remains with us is the threat to wilderness areas throughout the world. Despite continuing progress on some fronts, the twin forces of increasing population and rising demand for resources incessantly consume the wilderness. We must be ever vigilant and active if we are to remain the vibrant core of a livable planet earth. That's what the World Wilderness Congress is all about.

—*Vance G. Martin*
President, The WILD Foundation
International Center for Earth Concerns
Ojai, California, USA
September 1994



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Finally, but certainly not least, we wish to acknowledge the hard work done by many people, without which the 5th WWC would not have occurred. Special appreciation goes to Bob Baron and Shirley Lambert; Jostein Mykletun and the 5th WWC Secretariat in Tromsø; to intrepid explorer Robin Buzza; to editors Lisa Williamson and Amy Lockwood, and to artists Simon Fraser and Kate Martin.



INTRODUCTION

KNOWING WILDERNESS

For the man who learns to live with it, after his own manner, nature becomes a friend—he finds beauty in it and feels himself a part of it. He who fails [to live with nature] becomes its enemy—he hates it and vomits at the thought of the biting wind, the corrosive frost, the naked, icy plateau and mountains. He who succeeds will always long to return. For him, the silence [of polar wilderness] is not a horror, but rather the welcome backdrop of his very existence.

—Henry Rudi (1889–1969)

Henry Rudi of Tromsø spent fifty years as a hunter in Svalbard and on Greenland. His environmental ethics might be considered eccentric today, but no one can doubt that he knew polar wilderness. Rudi would probably have scorned the science and the politics discussed at the 5th World Wilderness Congress (WWC); his priorities were sharply focused. But he probably would have agreed with the opinion of distinguished polar scientist Fred Roots on the significance of polar wildernesses. “They,” said Roots, “have provided essential elements of history, culture, knowledge, psyche, and spirit, for better or for worse, for at least the past 2,300 years.” And, today, they are important to our awareness of ourselves, our environment, and to what actions we can take towards a sustainable future. This was the essence of the 5th WWC.

The last four decades have witnessed an enormous increase in our knowledge of polar regions. This book includes examples of discoveries and developments in both basic and applied science, in exploitation of both renewable and non-renewable natural resources, and of new information—and clear warnings—about the consequences of human activity at high latitudes (Paul Dingwall, Pamela Miller, Bent Muus). You can also find here a healthy skepticism of the usefulness of “professional” knowledge for wilderness conservation (Silje Gamstøbakk), reflecting, among today’s youth, the nagging doubt of Fridtjof Nansen, Norwegian scientist, explorer, humanitarian, and statesman, about the real justification of this restlessly progressing knowledge (Geir Hestmark).

We need hard facts, of course, lest our enthusiasm warps our perspective. Popular focus on relatively rare catastrophes, such as crude oil spilling from a grounded tanker, diverts public attention from small-scale, chronic, and rather “unexciting” problems like the pollution caused by the authorized discharge of oil-containing water from ships. Yet Vladimir Kalinnikov and Anatoly Vinogradov point out how this now occurs on such a scale that the total polluting effect of normally operating fishing fleets and oil platforms in the North and Barents seas, for example, is equivalent to one major disaster every five years. Likewise, behind all the talk of “ecosystem balance,” or through human interference, lies the much more sobering possibility that northern ecosystems are inherently unstable; “imbalance” may be their normal, natural state (Egil Sakshaug¹). How this complicates the satisfying concept of sustainable harvest!

Wilderness, too, is an important concept, and one which, happily, is gaining increasing international political respectability (Vance Martin, Sirpa Pietikäinen). It did no harm, therefore, to be reminded at the 5th WWC of the diversity of ideas that underlie the concept of wilderness (Mervin Franks, Rosemarie Kuptana, Henriette Rasmussen)—even, in one carefully argued paper, to the extent of a plea for avoiding the term altogether (Ole Henrik Magga).

Indigenous peoples played a conspicuous role at the congress, not the least because Tromsø concurrently hosted the Reindeer Peoples’ Festival, which was organized in cooperation with the congress by the Sami Reindeer Herders’ Association of Norway. Nineteen ethnic groups from the circumpolar North were represented, and the meetings culminated in creation

¹ Egil Sakshaug’s paper was not submitted for inclusion in these proceedings, but see instead the paper by E. Sakshaug, A. Bjørge, B. Gulliksen, H. Loeng, and F. Mchlum, “Structure, Biomass Distribution, and Energetics of the Pelagic Ecosystem in the Barents Sea: A Synopsis,” in *Polar Biology* (1994).

of the World Reindeer Peoples' Union, which now has its permanent secretariat in Tromsø. This is an excellent development. Another excellent development was the creation of the Great Arctic Reserve in Russia (Peter Prokosch), and that achievement was honored at the congress by conferring the Green Leaf Award (Rakel Surlien) for 1993 on the people of Taymyr and the international team responsible for the work that culminated in the creation of the reserve.

These are just two manifestations of the awareness and creative energy for the conservation of our natural environment of which the WWC also is a part. This work is simply *vital*. There is no alternative. I take this opportunity to salute the work of all the speakers at the congress and the organizations they represent, whose efforts in this regard are summarized in these proceedings.

—*Nicholas Tyler*
Chairman, 5th WWC Program Committee
Tromsø, Norway
June 1994



THE CREATIVE WILDERNESS

Thor Heyerdahl

Civilized humans have too little time to think, especially about the distant past and distant future. Unless we think of what the wilderness meant to our ancestors and what the mega-cities will mean to our descendants, we'll lose perspective and go wild within our own civilization.

Human beings have lived within the ecosystem of this planet for an estimated two million years. We shall never know when our ancestors began to call our ecosystem a *wilderness*. But we do know that ever since the first known civilizations began to grow and spread from Mesopotamia, Egypt, and the Indus Valley about 5,000 years ago, humans have waged a deliberate war against their environment.

However, this is not true for the so-called primitive peoples who live in harmony with what we call wilderness. The more civilized we become (i.e., the more we invent, produce, and consume), the less we feel for the wilderness, the less we understand of the wilderness, and the more we triumph in winning the war against nature.

Until recently, we have taken it for granted that every step away from nature is a step in the right direction, and we call this *progress*. The faster we travel, the more we stress. The more we tell each other that time is money, the less time we have. In fact, we've struggled more than any previous generation, and more than many "uncivilized" people living today.

Civilization has basically become a way of complicating simplicity. Something must have gone wrong when too many humans moved from the forests and fields into the cities, where too many people work under stress to survive and too many others don't work at all. Our only comfort is that most



*Spruce (Picea Abies) timberline,
Tupuliselka, Hammastunturi Wilderness,
Finland. (Photo by Tapio Tynys.)*

of us who still have our daily bread feel we are better off than the people who lived during the dark, medieval ages. And probably we are right, if we ignore one-third of the Earth's population who starve and suffer in the urban areas. But they are as far away from the wilderness as we are who live in abundance at the cost of the others and the ecosystem that we still share in common.

Those of us who have seen the endless number of people living in the slums, and perhaps also lived among people who, until the end of the twentieth century, live in direct and intimate contact with nature, will best understand that not all steps away from nature are human blessings. Soil and water can still take care of poor families in rural areas, whereas streets and beautiful shop windows have no mercy for those who have no money to buy the cakes and clothing on display.

We have something to learn from the people we want to civilize only because they lack our technology, money to buy our automobiles, and live in houses with earthen floors and milk their goats by hand. We would like them to learn from us and to buy from us. We would like to sell them computers so they could sit and work with their fingertips like we do. We pity those who still must use their arms and legs, and we forget that they get less tired from day-long physical work than we do after five minutes of morning exercise in a futile attempt at maintaining the sparse muscles we have left.

We have invented all sorts of gauges to measure size, weight, volume, and wavelength, but we have no instrument to measure human happiness. Yet, happiness is what we ultimately seek. We take it for granted, as indisputable fact, that we must be happier with all our television entertainment and press-button systems than those who have never seen a screwdriver or a wire and never moved faster than on horseback.

Nature has given humans something we can read to determine if a person is happy—facial expressions, particularly the smile. The broader the smile, the happier the person. And when we really bubble over with enjoyment, we laugh. Walk the streets in an average city, and a thousand people pass by without a smile, as if walking in a dream. Paddle into a reed hut settlement among barefoot marsh Arabs or walk into a village of sun-dried mud-brick huts in an oasis in northern Peru, and every person you look at instantly smiles back. And nowhere do children laugh or play more merrily than in areas where neither automatic toys, television, or superhuman comic strips entertain them. If the smile is a gauge for an outsider to read another person's happiness, or to test our own if we look in a mirror, then there must be something aboriginal peoples still possess that the rest of us have lost in our eagerness to accumulate material possessions and technological progress.

It is easy to tempt aboriginal peoples to abandon their customs and follow us down the road of technological progress. Show any of them a button or a wheel, and they will turn on a television or drive a car as easily as any of us. And never have we, from the so-called developed nations, done more to teach others our way of living than just now, when we are beginning to see the serious flaws in our own civilization and feel ever more uncertain as to whether or not we are on a safe course.

Never, until the present generation, have men and women all over the world begun to fear the obvious fact that humankind is rapidly approaching a total victory over nature. We are, in fact, afraid that we might win. Certainly, if we give two billion cars to all those on this planet who still have none, we will be another step closer to victory.

In the last century, Charles Darwin taught his contemporaries to think about, and not blindly accept, the words of the prophets who preached that humans came from a "Paradise on Earth" a number of generations ago. Today, there is an urgent need to follow up on Darwin's mode of thinking, in the opposite direction—into the future.

Are we to trust the modern prophets, the technologists and politicians, when they promise us that we are heading into a "Paradise of the Future" if we support their current leadership? Will the computer-trained Adam and Eve of the future walk into a better world than the one of their predecessors? Is it enough to eliminate the lions and crocodiles and replace them with computerized creatures so that humans do not hang nuclear fruits on the Tree of Knowledge instead of sweet apples? Is there something wrong with our environment *or* ourselves?

Since humans moved into walled cities in early antiquity to protect themselves from their fellow human enemies, they lost contact with the forest. The green world that previously bred and fed them became the dark and dangerous home of lions, bears, and wolves. The birthplace and cradle of our ances-

tors became a wilderness, looked upon by urban dwellers as something hostile to be conquered and eliminated. And since Charles Darwin launched his theory of evolution, modern humans began to see the shadows of their ancestors as hairy apes, tempting us to rush forward ever faster in a blind escape from the green world that fed us and towards the dream cities of steel, asphalt, and plastic. Perhaps, in our hurry, we lost sight of both the past *and* future.

In reality, we know incredibly little about the early human past and distant future. Our ancestors' myths and fairy tales are closer depictions of reality than are the dreams of our technologists. The extreme technologists actually believe that if we destroy our environment, they will help our descendants survive by constructing life-sustaining flying platforms in outer space. With billions of humans now lacking beds to sleep in, how many of our descendants can we afford to send into outer space? What will happen to those who remain?

To move in the right direction, we must at least encourage our children to keep their minds unpolluted of such false ideals and futile dreams. Modern pollution is easily observed in our environment, but it is also inside ourselves.

While science and religion continue to discuss evolution versus creation, there is full agreement about the fact that early humans grew up in nature. And there is no alternative. Many species lived on this planet, most of them for millions of years, before humans appeared, whether they evolved, were created, or were created through evolution.

If nature was a human enemy, how could children have survived in it? Who protected the first untold generations of naked men and women? Nothing in the wilderness was in greater need of being nursed and protected than the first human beings. Other species were equipped to protect themselves.

During evolution, other and older species developed horns, tusks, fangs, or claws to defend themselves; quills, carapace, or venom for protection; and wings, tails, fins, or four legs for fast escape. But not so for humans who walked naked and barefoot, looking for food. A carnivorous feline could run or jump faster than a human, who became easy prey for the cat. Every niche in the environment was already occupied by specialized species with claws, jaws, tails, hoofs, and wings, preventing humans from accessing the food nature had so far only produced and provided for the animals. Humans came into the wilderness as competitors.

But nature eventually found room for humans. They began to walk in peace and multiply. In fact, nature provided so well for our early ancestors that they then revolted and assaulted their hairy roommates in the green wilderness that so far had nourished and protected them all.

Whether we believe in God or Darwin, we need to do some rethinking. We should not be so afraid of the hairy apes behind us, but perhaps of the imaginary superhuman in front of us.



EDITORS' NOTES

All measurements in this publication are given in metric terms. For the reader's reference, 1 hectare = 4 acres and 1 tonne = 1,000 kilograms or 2,205 pounds.

Individual papers have been edited for style and clarity. For references or further information, please contact individual authors. (See Supplementary Material.)

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LIST OF ACRONYMS

- AEPS—Arctic Environmental Protection Strategy
AEWC—Alaska Eskimo Whaling Commission
AMAP—Arctic Monitoring and Assessment Program
ASMA—Antarctic Specially Managed Area
ASPA—Antarctic Specially Protected Area
ATS—Antarctic Treaty System
ATCM—Atlantic Treaty Consultative Meeting
CAFF—Conservation of Arctic Flora and Fauna
CAMPFIRE—Communal Areas Management Plan for Indigenous Resources
CCAMLR—Convention on the Conservation of Antarctic Marine Living Resources
CDQs—Community Development Quotas
CNPPA—Committee on National Parks and Protected Areas
COMNAP—Council of Managers of National Antarctic Programs
EEA—Energy and Environmental Analysis
EEC—European Economic Community
EIA—Environmental Impact Assessment
EEZs—Exclusive Economic Zones
IAATO—International Association of Antarctic Tour Operators
ITC—Inuit Taparissat of Canada
IUNC—World Conservation Union
IWC—International Whaling Commission
MAB—Man and Biosphere

MPAs—Multiple Use Planning Areas
NAFO—North Atlantic Fishing Organization
NAMMCO—North Atlantic Marine Mammal Commission
NGOs—Nongovernmental Organizations
NWPS—National Wilderness Preservation System
OECD—Organization for Economic Cooperation and Development
SCAR—Scientific Committee on Antarctic Research
SPAs—Specially Protected Areas
SRAs—Specially Reserved Areas
SSSIs—Sites of Special Scientific Interest
STATOIL—State Oil Company of Norway
TACs—Total Allowable Catches
TVA—Tennessee Valley Authority
UNCLOS—United Nations Convention of the Law of the Sea
UNESCO—United Nations Economic, Social, and Cultural Organization
USDA—United States Department of Agriculture
USDI—United States Department of the Interior
USFS—United States Forest Service
WCMC—World Conservation Monitoring Center
WILD—International Wilderness Leadership Foundation
WWC—World Wilderness Congress
WWF—World Wide Fund for Nature
WLS—Wilderness Leadership School
ZERO—Zackenbug Ecological Research Operations

Section I



**WORLD
WILDERNESS**



THE WILDERNESS IMPERATIVE

Ian Player

In the autumn of 1975, my Zulu friend and mentor, Qumbu Magqubu Ntombela, and I were leading a group of six people into the brooding savannah country of the Umfolozi Wilderness. Magqubu had been born and bred in what is today known as the Umfolozi Game Reserve, and he knew the country like the back of his hand. Not only did he know about the animals, the birds, and the trees, but he also knew about the history of his people.

One night, we camped beneath a huge sycamore fig tree and sat around the fire. I clearly remember that night because the lions were roaring downstream, the rhino were shuffling on a path that led close to where we were sleeping, the hyena were whooping in the hills, the jackals were hunting and calling, and the bushbuck antelope were barking all around us. When I looked up into the great Southern Galaxy, I saw the Southern Cross, which is to Africans, Australians, and New Zealanders what the North Star is to Europeans. It was a wonderful, magical African night, and I intuitively knew that something significant was going to come out of this particular trail (trek).

Magqubu, who was seventy-five years old at the time, began to tell us stories. What a wonderful storyteller he was. He told us how he grew up in the Ongeni area, learning from his father and the old men in his *kraal* (home), the meanings of *blonipho*, which implies respect for all things, including people, tradition, plants, animals, and ancestral spirits, and *ubuntu* (compassion). Magqubu said that the spirits of the old people who lived in the Umfolozi are guarded by the snakes in the isolated ravines, and that the spirits were there to protect us and look after the wild country.

He went on to tell us about the Zulu months of the year, a poetic description of the seasons. He said that April was *Mbasa*, which is the time to make fires and move inside the huts. July is *Ntulikazana*, which is when the winds first come and blow the leaves off the trees. August is *Nbloyiwe*, when the yellow-billed kite comes down from the north; the name of the month is derived from the onomatopoeic sound of the birds calling. September is *Ulwezi*, which means that when you look across the landscape, it is like looking through a spider web because of the first fires that have begun in the land. October is *uZibandlela*, when the grass starts to grow over the paths; and December is *kNkonkoni*, when the wildebeests begin to calve.

That night, as I sat alone on watch at the fire to keep the lions away, I thought how wrong it was that a man with such insights and knowledge as Magqubu was not more widely known. He could not read or write, but he was a brilliant naturalist and orator. So, it was that night, sitting around the fire underneath the Southern Cross, that the idea of a world wilderness congress was born. Strangely, and yet maybe not so, the next morning Magqubu said to me: "You know, it is time that we have a big *indaba* (gathering) of all the people that we have brought out here, so that we can get them together from all over the world and in this way begin to help and educate more people to save wild country." This confirmed my feeling of the evening before, and I decided that the moment I got back into town, I would begin to work towards having a world wilderness congress.

It took two years, and then in October 1977, in the midst of some of the worst apartheid years in southern Africa, and during the infamous Soweto Riots, the congress took place. This was a miracle. There were some forty international speakers in attendance, including artists, poets, hunters, musicians, and writers. For me, one of the most important aspects of the congress was seeing Magqubu and other indigenous people, who had given their entire lives to nature conservation, on the same platform as leading politicians and environmental and cabinet ministers.

What a wonderful talk Magqubu gave that day. He captured the attention of everybody who was there and without question received the greatest applause. Also in attendance was a Kalahari Bushman, with Laurens van der Post interpreting his speech; an Indian girl, Carol-Anne Brandt, and Stewart Udall, former U.S. Secretary of the Interior under former U.S. President John Kennedy. The congress was the beginning of a long line of other congresses that I believe have all contributed to a better understanding of wilderness in our world.

The next congress was held in Cairns, Australia, in 1980, thanks to Verne McLaren, who was its major contributor and organizer. In 1983, the third congress was held in the Scottish Highlands at Inverness and Findhorn. In

1987, the fourth congress was held in the United States. Each congress followed the successful pattern of the one before and brought together those of us who know the power of the wilderness experience in transforming human lives and giving meaning to and leading to a deeper understanding of the world's current spiritual and ecological plight.

Many of us who are committed to the wilderness walk a narrow line and face barbaric people and ideas. I use the word *barbaric* carefully because there are developers and mining companies and insensitive and incompetent governments that have no feelings for anything wild and seem to think that they have the God-given right to do anything they wish to the world. Yet, it is ironic that without wilderness and wildlife, many people could not maintain their sanity. Our world is strange, and there are many incongruous things happening.

Take the film *Jurassic Park*, which was a box-office hit, as an example. The film depicts the age of dinosaurs, which have long vanished from this world. In the world today, a similar thing is happening. The rhino, which are living remnants of dinosaurs, are being wiped out as the world stands by, watching movies instead of taking action.

In 1960, when Operation Rhino initiated the capture and translocation of the white rhino from the Umfolozi Game Reserve to their former habitats in southern Africa, there were some 70,000 black rhino in Africa. There are now only some 2,500, and their numbers continue to decline daily. The majority of these animals are in South Africa, and we have battled against great odds to keep this population alive. Even the people who are trying to protect them are sometimes killed.

The white rhino, which we took at great cost, effort, and injury to Mozambique, have now been wiped out again. Mozambique has the dubious distinction of being a country where two rare species have become extinct within one hundred years. Of the white rhino that we took to Wankie National Park, I believe none are left. The same is true in Botswana, where, I believe, of the approximately one hundred animals that were taken there, only four remain. A few white rhino still survive in relative safety in the Zululand and Natal game reserves and ranches. The AK-47 assault rifle is killing both the people and wildlife of Africa.

It has long been my view that the time has come to employ a United Nations paramilitary force to tackle conservation problems. Just as civilians are protected during political upheaval, so must wilderness and wildlife be protected during environmental crises.

I would now like to focus on indigenous peoples. In 1850, when my great grandfather arrived from England in South Africa, it was the colonists' official policy to wipe out the San Bushmen who lived in the Drakensberg

Mountains. In the 1970s, 120 years later, our eldest son was fighting with the South African Army in Angola. He returned to tell us how a young bushman saved his platoon because the bushman could see where the mines had been laid in the sand. Also, his hearing was so acute that he could hear the gray duiker, a small antelope, walk through the sand.

Andrew Muir, National Director of the Wilderness Leadership School (WLS), tells a story about some bushmen who were removed from the Kalahari Desert to a farm in the Cape Province. Some of these bushmen are now WLS trail guides. On one trail, they came upon the spoor of an otter, and although these bushmen had no knowledge of otter because they came from a desert area where there was no water, they were able to describe the shape and size of the animal from the spoor. Later, when the white trail guides proudly pointed out the spoor of a leopard, the bushmen looked at it and said: "Yes, you are quite right, it is a leopard, but do you know that it is a female and that she is pregnant?"

I recently spent time with some aboriginal people in the desert of the Northern Territory in Australia. I was moved by what these native people had to say. James Cowan, an Australian, said that the Australian aboriginal peoples talk of a metaphysical power within the landscape. One has only to sit beside the fire and listen to these desert peoples to understand that Cowan is absolutely right. A member of the Uyen tribe captured the essence of aboriginal culture in the following lines of poetry:

Ah, white man, I am searching for sites sacred to you, where
you walk in silent worship and you whisper poems too; where
you tread in wonder, and your eyes are filled with tears, and
you see tracks you travel down your 50,000 years.

In 1955, when I was a young game ranger in Zululand, stationed in the Umfolozi Game Reserve, I spent many days walking down the White and Black Umfolozi rivers talking with the old Zulu game guards about the history of this wonderful landscape. It was at this time too, thanks to my friend, Jim Feely, who was a great admirer and reader of American wildlife literature, that I was able to read about the ten fundamental principles of the wilderness concept in a book on wildlife management by a man called Tripensee. It was without question one of the most remarkable reading experiences that I have ever had. For the previous three years, I had been working in the wild country of Zululand and now suddenly reading these ten fundamental principles became for me a fusion of Logos and Eros. The words described what I had experienced during my foot, canoe, and horse patrols in Zululand and other wild country that I had explored.

Since then, there has been an explosion of wilderness literature. Authors Paul Shepard, David Rosark, Max Oeschlager, John Hendee, and others have given the world the opportunity to read about the importance of wilderness to humankind. We have now reached the point in human history where we have no excuse anymore not to defend wilderness and wildlife. It is imperative that we save them because our own survival depends upon it.

Major disasters are evident all around us. I recently watched a television documentary about frogs and how they are disappearing from the world. I instantly knew that this was perfectly true. In my own homeland in the Karkloof Valley of Natal, over the last twenty-five years there has been a steady reduction in the number of toads and frogs. When my family first moved into the valley, after the early rains, we could hardly sleep amidst the noise of the frogs. We don't hear them much anymore. What does this tell us? Marilyn Robinson perhaps gives us the best explanation when she says: "Who can say what shadow announces the death of the afternoon?" I believe that we all need to listen to what the animals and the birds are telling us because they are the indicators of what might happen to us.

I ask you to pause for a moment and think, not only of the wild places and animals that are being destroyed, but also of the indigenous peoples of the Kalahari, the central African forests, the South American forests, and Asia. We must also think of the powers greater than ourselves. We are certainly going to need the help of the Great Spirit of the American Indian peoples, Nkulukulu of the Zulu people, and the God of the Western World to keep us from destroying nature and its bounty. I am reminded of the following biblical injunction: "I will lift up mine eye unto the hills from whence cometh my help."



WILDERNESS DESIGNATION— A GLOBAL TREND

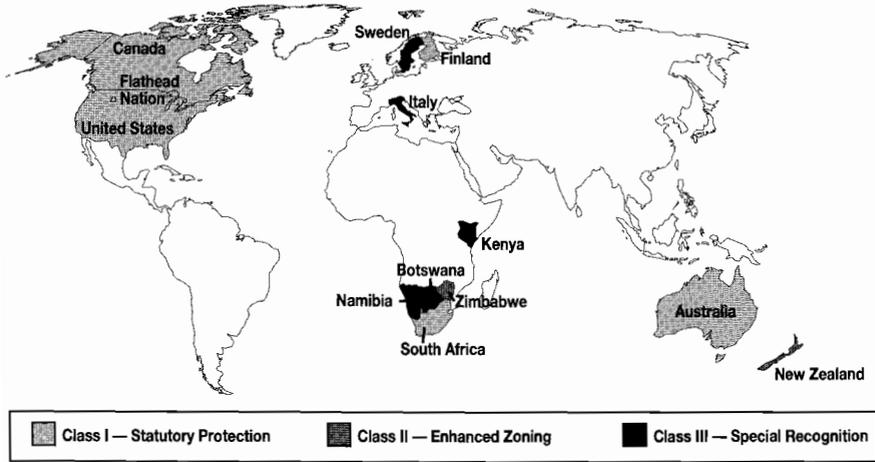
Vance G. Martin

The official designation of relatively pristine, natural areas as *wilderness* is a twentieth-century, post-colonial, democratic phenomenon. Unlike hunting grounds or wildlife reserves that were designated by royal decree in ancient Persia and during the reign of the Mogul emperors in India, or the national park concept that began in 1872 with the establishment of Yellowstone National Park (and which was extensively used by colonial powers and national governments for fifty years thereafter), *wilderness* as an official land-use classification began in 1924 with the establishment of the Gila Wilderness Reserve in New Mexico. Aldo Leopold, an unusual and visionary United States Department of Agriculture Forest Service (USFS) forester, was instrumental in this early action, and he eventually saw 233,000 hectares of the Gila National Forest set aside for “primitive recreation,” excluding motorized transport.

Forty years later, after unprecedented involvement by the American public in natural resource politics and policy, the Wilderness Act of 1964 was passed by the U.S. Congress. As much of a piece of poetry as an act of national policy—with such phrases as “community of life”; “untrammelled by man”; “where man himself is a visitor who does not remain”; and “where the imprint of man’s work is substantially unnoticed”—the Wilderness Act began a process that has led to an extensive, and still expanding, National Wilderness Preservation System (NWPS).

As this movement from wildlands-as-natural-playgrounds to wilderness-as-national-policy gathered momentum in the United States, wilderness ad-

Types of Wilderness Designation



vocates in other countries began to take notice, and a network of colleagues was formed. For example, Lance McCaskill was deeply influenced by Americans Aldo Leopold and Olaus Murie, and New Zealand's movement towards wilderness designation began. Also, Howard Zahinzer of the Wilderness Society in the United States sent the transcripts of the U.S. Senate hearings on wilderness to Ian Player (then a game ranger in South Africa), which helped accelerate and shape the move towards wilderness legislation in South Africa. A global trend was initiated in which advocates insisted that wilderness be recognized as a specific, formal, land-use classification.

Because of the definitive manner in which the Wilderness Act and the NWPS circumscribe wilderness activity in the United States, American wilderness experts and activists tend to approach the international wilderness movement in a rarefied state of experience and expectation. In reality, however, international wilderness designation is found in a spectrum of protection and recognition, ranging from casual use of the word *wilderness* as a descriptive adjective, to its classification through administrative zoning, to legal statutes. We can define the following three classes of formal wilderness protection, plus other types of wilderness recognition:

1. *Class One—Statutory*—This classification is the highest wilderness protection, wherein national and/or state/provincial laws protect officially designated wilderness and mandate appropriate management. Class One wilderness designation is a legal act and cannot be easily changed. This occurs in the United States, Australia, South Africa,

Canada, Finland, and on the Flathead Indian Reservation (Montana).

2. *Class Two—Enhanced Zoning*—In this type of classification, administrative declaration is backed by unique procedures and/or strong public support. Specialized management is usually called for, and somewhat increased protection is promoted (while still falling short of statutory protection). This type of zoning is considered enhanced because it is the result of action through a voting or consultative procedure of a governing or jurisdictional board, as in New Zealand and Zimbabwe.
3. *Class Three—Wilderness Recognition*—This classification occurs through administrative action at a departmental or local level. Class Three action includes some sort of policy decision that results in wilderness zoning and usually implies (but doesn't always provide for) specialized management or recognition of the wilderness values in a particular area. This is found in numerous countries, including Botswana, Namibia, and Italy.

Wilderness is also a classification in the World Conservation Union's Framework for Terrestrial and Marine Protected Areas (Category I). Wildland values, but not the term *wilderness*, are recognized in numerous other systems or protocols such as UNESCO's Man and Biosphere reserves and World Heritage sites, Russia's *zapovednik* system, and Brazil's indigenous and extractive reserves. Also of note has been the concerted call from many nations to declare Antarctica an International Wilderness Park.

CLASS ONE—STATUTORY

United States

As of September 1993, the NWPS encompasses 39 million hectares of public lands managed by the USFS and United States Department of the Interior National Park Service, National Fish and Wildlife Service, and Bureau of Land Management. While a minimum size of 5,000 acres (approximately 2,000 hectares) was mentioned in the Wilderness Act, the "ability to be managed as wilderness" phrase overrides the minimum size criteria. Therefore, in the 564 NWPS areas, we see a range of between 2 hectares at Oregon Islands National Park in Oregon to 3.5 million hectares at Wrangell-St. Elias National Park in Alaska.

Australia

Australia has had a long, active, and vociferous wilderness debate, spanning the entire continent and involving several key non-governmental organizations (NGOs) and government departments. In Australia, considerably more emphasis is placed on state rather than federal legislation, and therefore the lack of a single national wilderness act is not a major problem. Three of the five states (New South Wales, West Australia, and Victoria) plus the Northern and Australian Capital territories have statutory wilderness recognition. Fifteen areas have been designated as such, ranging in size from 2,400 to 113,500 hectares.

Considerable attention at a national (commonwealth) level also exists, as is evident in the newly completed National Wilderness Inventory. Begun in 1986, the program was accelerated in 1980 in order to develop computer-based wilderness inventory techniques to help monitor resource losses, delineate wilderness areas, define management options, and predict the effects of development scenarios on wilderness values. Interestingly, the inventory does not specifically identify wilderness areas or directly select areas that merit wilderness protection. It merely provides the natural resource information and other tools necessary to assist these policy decisions.

As a result, we will certainly see a great deal more wilderness designation and activity throughout Australia. With groups such as the Wilderness Society of New South Wales, Tasmanian Wilderness Society, Australian Conservation Foundation, and others, widespread and continuing national, public involvement is guaranteed.

South Africa

South Africa's first wilderness area was administratively zoned in the Umfolozi Game Reserve (Zululand) in 1958. By 1971, legislation was introduced into the amended Forest Act to specifically recognize wilderness areas in national forests. In addition, wilderness zones are still administratively declared in most national parks and provincial game reserves.

As of 1993, the Forest Act protects some 275,000 hectares of wilderness in eleven areas, with generally good management plans. Four additional areas are proposed as national forest wilderness, which would add an additional 152,000 hectares. Other administrative wilderness zones, most of which are managed as wilderness, involve at least another 715,000 hectares.

Important to note here is the popularity of wilderness trails (treks) in South Africa. Around the world, a basic tenant of wilderness recreation is that it is unmotorized and done on foot, in a canoe, or on horseback. The Wilderness Leadership School pioneered in Africa the concept of public walking trails in the wilderness. Prior to establishment of these trails, most

nature conservation professionals considered it unwise and unsafe for people to walk in wild areas. Walking in game reserves and remote areas of national parks is still forbidden by law in many African countries.

Special mention should be made of Lake St. Lucia in Natal Province, which is likely the only area in the world in which a portion of a lake is designated specifically as a "lake wilderness area." An administrative wilderness zone was declared within the lake (with fence posts actually emerging from the water to delineate the boundaries), in which no motorized boats are allowed. Lake St. Lucia and its surrounding dunes and wetland areas is the largest estuary in Africa and a biological keystone on the continent. The integrity of the area is under threat of dune mining, and a major international and national debate is currently being waged.

South Africa is in major political and social transition, as a new constitution and democratic political structure are being created. While significant achievements have been made in wilderness designation, the pressing needs presented by a high population growth rate, especially among poor, rural blacks, pose critical questions for the country regarding future land-use designation and the wilderness movement. The Wilderness Action Group is an ad hoc group of professionals pressing for a national wilderness act.

Canada

The National Parks Act was amended in 1988, requiring that boundaries of wilderness zones within national parks be designated through legislation. The Canadian Parks Service has a big job ahead of them in this regard and the potential for wilderness is vast, with 34 national parks covering 182 square kilometers, of which 90 percent is wilderness quality. At a provincial level, two of the nation's ten provinces (Alberta and Newfoundland) have wilderness legislation, and British Columbia and Ontario have wilderness zones and other protected areas.

Indigenous peoples' involvement in potential wilderness designation is a growing and major force in Canada. One example is the agreement reached in 1987 with the Haida people to establish a national park in the Queen Charlotte Islands area, the Haida homeland. A proposal to establish an indigenous state encompassing 20 percent of Canada, called *Nunavut*, failed in national referendum, but it will undoubtedly resurface and have significant impact on management of northern wildland and wilderness areas.

The most recent and internationally significant wilderness development was the declaration in June 1993 of the Tatshenshini-Alsek Wilderness Park, which was under threat from the proposed major expansion of a copper mine. The one-million-hectare Tatshenshini-Alsek area was declared by the premier of British Columbia because "mining activity would be incompat-

ible with full preservation of wilderness” and it was “unlikely that consensus would be reached on the issue.” This major declaration is even more significant when one considers that the Tatshenshini-Alsek is contiguous with Wrangell-St. Elias and Glacier Bay national parks (Alaska) and Kluane National Park (Yukon), which together comprise some 8.5 million total hectares of key importance for salmon spawning, grizzly bear habitat, and unparalleled scenic and recreational benefits.

Finland

The newest Class One addition to wilderness designation is Finland, where the Wilderness Act was approved by Parliament in 1991. Interestingly, this is the only other national act besides the U.S. Wilderness Act (1964) that is actually called a *wilderness act*. The Finnish act designated 1.5 million hectares as wilderness, with these objectives: to maintain wilderness, to secure the (indigenous) Sami culture and traditional means of livelihood, and to develop multiple use of natural resources. Importantly, the act sees that the basis for wilderness conservation lies in the coordination of the traditional means of livelihood, recreation use, and some forestry allowances.

These objectives are admittedly a bit contradictory, as it is not possible to maintain wilderness character while simultaneously promoting multiple use. Therefore, zoning within the wilderness allows for core sanctuary areas where wilderness conservation and appropriate recreation is the highest priority; and buffer zones allow for low-intensity, sustainable forestry.

In keeping with the democratic nature of the wilderness movement, it's interesting to note that while planning the Wilderness Act and its subsequent land-use allocations, the Finnish Forest and Park Service encouraged public participation for the first time.

Flathead Indian Reservation

The over three hundred federally recognized American Indian reservations in the United States are sovereign nations. The Confederated Salish and Kootenai tribes live on the Flathead Indian Reservation in western Montana and are somewhat unique among indigenous peoples with respect to wilderness protection. They established the Mission Mountains Tribal Wilderness Area in 1980, adopted a management plan for the area and, most recently, designated a buffer zone (with a management plan) surrounding the wilderness area.

The Mission Mountains area encompasses some 36,000 hectares. In addition to its biological and recreational values, the area was established in recognition of the wilderness-based cultural and spiritual values held by the

tribes. The land is open to the public, but nontribal members must purchase a conservation license for U.S. \$6 to access the land and waters in the area. The tribe has an official Wildland Recreation Program, which manages the wilderness area, plus a primitive area designated in 1974, access to which is limited to tribal members, spouses, and families.

CLASS TWO—ENHANCED ZONING

New Zealand

In 1955, with the administrative designation of the 12,000-hectare Otahake Wilderness, New Zealand earned the distinction of being the first country outside the United States to officially recognize a wilderness area. Through 1991, a total of six areas had been gazetted as wilderness, totalling 300,000 hectares, with another five areas zoned as wilderness that have corresponding management plans, adding an additional 164,000 hectares.

New Zealand's wilderness protection falls under two acts: (1) National Parks Act (1980) and (2) Conservation Act (1987). The Minister of Environment declares the designation method on the recommendation of the Parks Authority in accordance with an appropriate management plan. The minister may also revoke any designation.

New Zealand's wilderness activity has been intensely public. A unified movement began to emerge in 1985 when a final wilderness policy was issued by a wilderness advisory group that consisted of several government agencies and NGOs. A prime player in this wilderness debate has been the Federated Mountain Clubs of New Zealand, which have consistently kept wilderness on the national conservation agenda.

New Zealand wilderness designation is Class Two because the appropriate national legislation sanctions ministerial declaration, not legal wilderness protection. However, given New Zealand's long history of public involvement in wilderness designation and recreation, and its well-established and sophisticated gazetting system, it is likely that the country will continue to add to its wilderness system and incorporate some form of statutory protection.

Zimbabwe

The designation of the Mavuradonha Wilderness Area in 1989 was a significant event in the global trend in wilderness designation. Previously, all designation and official use of the term *wilderness* had been in developed countries with well-established leisure economies and interest in outdoor recreation.

The establishment of the Mavuradonha Wilderness Area in Zimbabwe was the first such use of the term *wilderness* in a developing nation. Combined with the fact that the designation was requested by a rural tribal council rather than an urban-based organization or a political bureaucracy, the designation is a significant rebuttal to the (increasingly irrelevant) argument that wilderness designation is an elitist action and of no value to poor, rural, developing nations.

The Mavuradonha Wilderness Area is approximately 500 square kilometers in the escarpment area of the Zambezi Valley and is bisected by a national roadway. Though economic benefit from safari hunting was the original objective for the wilderness area, the Tribal Council de-emphasized economic values but continued to place high priority on the wilderness values and further wilderness designation.

Additional wilderness areas are under consideration by other tribal councils, all of which participate in the Communal Areas Management Plan for Indigenous Resources (CAMPFIRE), an innovative program promoting local management of wildlife and natural resource programs that directly provide economic benefits to local villages.

CLASS THREE—WILDERNESS RECOGNITION

Administrative declaration of wilderness zones, either within existing protected areas or on private land, is increasing. Botswana, Namibia, and Italy provide such examples.

A wilderness zone was established in 1992 within the Moremi Game Reserve in the Okavango ecosystem in northern Botswana. The management plan for Moremi designated one of the concessions (leased recreational areas) as wilderness and, therefore, suitable only for nonmotorized recreational use. As is not uncommon in these circumstances, however, departmental wardens and game scouts lack the training to implement this specialized management.

In contrast, Namibia has a well-evolved wilderness zone within the Waterberg National Park, with well-defined management goals, peripheral rustic camps, and an established schedule of wilderness-trail hikes led by experienced rangers/interpreters. Interestingly, both of these southern African examples have developed without significant NGO activity, but rather as a result of wildlife department professionals having specialized training (as in the case of the Waterberg warden) or because of policy direction to diversify tourism (as in Moremi).

Italy has wilderness zoning in several areas, largely due to the untiring efforts of Associazione Italiana per la Wilderness, an NGO founded by Franco



Sign for the Monte Camulera Area Wilderness. Photo by Franco Zunino. (Note how the English word "wilderness" has been adopted as Italian land-use designation.)

Zunino. The first zone was established within the rugged mountains of Val Grande Park in the Piedmont region, one of the few remaining haunts of the European brown bear. Eventual statutory protection at a regional level is anticipated. Numerous other small wilderness zones recently declared at a municipal level, such as the Fosso del Capanno Area Wilderness, represent continued expansion of the concept.

Several aspects of the Italian wilderness movement are worth noting. First, it is the only such formal movement in Europe (outside Scotland) and has important symbolic value because Europe is regarded as tamed and domesticated, essentially without wilderness. Second, Italian conservation professionals and others involved in this issue have adopted the English word *wilderness*, with *area wilderness* now in common usage. This is the first time that this has occurred in a country where English is neither the primary language nor even commonly spoken.

OTHER WILDERNESS USES

Latin America

In contrast to the Italian example, where the word *wilderness* has emerged as a distinct term, Latin America describes wilderness as *area silvestre*. The English word *wildlands* is also commonly used throughout the region.

Wilderness values are being conserved in Latin America through a wide

range of unique and promising initiatives that clearly promote local, indigenous community involvement in their nearby wildland areas. Brazil has also launched several efforts that have considerable potential for wilderness and wildland conservation. Establishment of indigenous reserves such as the Yanomami Reserve in the Amazon forbids modern encroachment and fosters self-determination among the primitive Yanomami people and supports their traditional way of life. Several “extractive reserves” have also been established throughout the Brazilian Amazon that allow traditional, nonmechanized harvesting of resources such as rubber sap, Brazil nuts, and medicinal plants. In the short term, at least, such initiatives clearly protect wilderness values.

Russia

While Siberia contains some of the most significant wilderness areas left on Earth, the pressures of development are exponentially increasing there. In Russia’s official land-use classification system, the most analogous term used to define wilderness is *zapovednik*, literally meaning “forbidden areas.” These areas were originally established solely for scientific research, but they are now being opened to tourists. While they are essentially undeveloped, few of these areas have functioning management plans to retain wilderness values, mostly because of lack of funding. For example, increasing use of motor vehicles in these areas by hunters (from Europe and America) and researchers is not uncommon.

Siberia is almost incomprehensibly large, with huge wildland areas containing vast deposits of natural resources. For example, the taiga forest ecosystem covers an area the size of the continental United States and twice the size of the Amazonian rain forest in Brazil.

A major achievement occurred in the tundra regions along the northern coast of Siberia in early 1993 with the creation of the Great Arctic Reserve on the Taymyr Peninsula. The largest of Russia’s *zapovednik* system, the Great Arctic Reserve makes a significant contribution to de facto wilderness protection in the North. In recognition of its rich wildland and biodiversity values, the reserve’s 4.2 million hectares are essentially protected from development and include over 500,000 lakes that serve as breeding areas for over 150 species of birds and the world’s largest herds of free-ranging reindeer (some 700,000 animals). Future plans for the area are aimed at linking the reserve with two other existing *zapovedniki* on the Taymyr Peninsula, eventually creating one huge biosphere reserve of 7.5 million hectares.

The UNESCO System

Two types of protected areas under United Nations Economic, Social, and Cultural Organization (UNESCO) designation are instrumental in con-

serving wilderness and wildland values. The first type, though not legally binding, is accomplished through listing an area on the World Heritage Register (as a World Heritage Site) and can provide the means by which to use national politics to gain conservation results. For example, the Tasmanian Wilderness Society used the World Heritage classification of southwest Tasmania as their principle leverage to eventually save the area from hydroelectric development in the 1980s.

Also, designation of Man and Biosphere reserves is an effective way to conserve wilderness and wildland values. Biosphere reserve status is applied to existing protected areas such as national parks. In the planning model for biosphere reserves, a core area is always established and strictly protected from development and inappropriate uses, with various uses permitted in surrounding buffer zones.

Marine Wilderness

While virtually all wilderness designation activity has been focused on terrestrial areas, there is a growing movement to apply such designation to marine environments. As mentioned previously, the Lake St. Lucia wilderness area in South Africa is a Class Three designation with considerable potential as a model for other large lake areas worldwide. Plans exist to designate a Greater St. Lucia Wetland Park, eventually including additionally designated marine wilderness off the coast, which would combine with the existing lake and terrestrial wildernesses to form the first designated marine-terrestrial wilderness.

Another notable example is the Great Barrier Reef. While the reef is not officially designated as wilderness, the zoning plan for the Great Barrier Reef Marine Park has significant safeguards to protect wilderness values, especially in the northern section of the park. The current National Wilderness Inventory in Australia urges the Great Barrier Reef Marine Park Authority to give considerable impetus to the concept of marine wilderness through officially establishing wilderness zones in the park.

The World Conservation Union

At its 1990 General Assembly, the World Conservation Union's Committee on National Parks and Protected Areas (CNPPA) proposed a new Framework for the Classification of Terrestrial and Marine Protected Areas, which was subsequently adopted in 1994. The framework now includes a wilderness category for the first time since 1973, at which time wilderness was downgraded from a category to a zone. The new Category I is entitled "Scientific Reserves and Wilderness Areas." This is a significant accomplishment after years of intensive internal debate and gradual progress through

the WWC working closely with the CNPPA. While no form of statutory protection is implied, the acknowledgement of wilderness as a legitimate land-use category lends considerable strength to conservation agency and environmental activist efforts and will certainly lead to further wilderness designation and protection.

Wilderness recognition and protection are gaining ground—progress is slow but steady. As the wilderness concept is used in different countries—whether as Class One, Two, or Three—it is evident that definitions vary somewhat and management regimes vary even more. But the most significant trends to emphasize are: the use of the term *wilderness* is growing; the term *is* adaptable to developing nations and some indigenous societies. Importantly, we need to assure that the essential qualities of wilderness—areas lacking permanent human development, possessing biological integrity, and providing solitude—are maintained as the concept is adopted by and adapted to different countries.



UNSPOILED NATURE— A PREREQUISITE FOR CIVILIZATION

Dag Hareide

Like most people, I'm a little confused about the word *wilderness*. I don't like it. What is really "wild" is probably the city. But, I will start with a definition: "Wilderness is an area where human influence upon the shape and structure of nature is no greater than that of any other species." In wilderness and nature, humans can be predators through harvesting the abundance of life. However, we cannot be dominators, reshaping the landscape and destroying the foundation of life for other species. Wilderness, then, need not exclude humans but may be a home where humans enter into a relationship of equality with and mutual respect for other living creatures. Perhaps then we can describe wilderness as the "quality of equality."

What I'm most concerned about, however, are the forces of destruction, the main force being humans and their technologies, which are about to conquer every inch of this planet. We now probably control approximately 40 percent of the planet's photosynthesis. At the beginning of the twentieth century, this figure was less than 10 percent. Within one or two generations, at the same growth rate, we could reach 100 percent. What then will remain of this "quality of equality"?

If and when we reach the 100-percent mark, we would create the doom of domination, two effects of which would cause us all to suffer. The first, and most obvious, effect is the overloading or surpassing of the critical loads of nature. We already know what some of these consequences and veritable data show us: between 50 and 200 species are extinguished every day; desert land has increased from 7 to more than 20 percent of Earth; fresh



*A bird hunter and his dog,
a Finnish spetz, make a team,
Harripaat, Hammastunturi
Wilderness, Finland. (Photo by
Tapio Tynys.)*

water is being degraded; ocean pollution, the greenhouse effect, and the weakened ozone layer are increasing; and much more.

But, there is also another critical load: the one of *human* nature. Before I became Secretary General of the Norwegian Society for the Conservation of Nature, I researched quality of life in Norwegian relationships. I found that human solidarity and fellowship can break down in two ways: through loneliness and violence, or distance and aggression. The actor/producer Woody Allen may explain these break-downs best when he says that there are only two forms of human relationships in New York City: one is psychotherapy, and the other is kidnapping.

A CONFLICT OF VALUES

I studied statistics in Norway from 1850 to 1990 about aggression, murder, criminality, depression, loneliness, and suicide. I found a relational curve indicating that there were no “good old days” in Norway. Prior to 1880, in the old

farming society, humans actually killed each other and themselves more. They also drank a lot of alcohol, which always tells us something about loneliness. Then from 1880 to 1960, things got better. During the last thirty years in Norway, however, the suicide and violence rates tripled, and the criminality rate quadrupled, which is similar to data from other European countries. My hypothesis, therefore, is that when the Gross National Product and the “materialistic pressure” reach certain levels, violence and loneliness start to grow exponentially, putting pressure on both nature and human nature.

A time comes when enough is enough. While material values must stop growing faster than life values, we still need both. Some people say that we cannot live by air and love alone. That is true, but we cannot live without them either. When a society’s material values dominate the culture, life values are squeezed out.

A comparison of these two values helps us define them. *Material values* are those that diminish the more you divide and share them, such as with power, money, and chocolate cake. It is the opposite with *life values*; the more you divide and share them, the more their value increases, such as with love, hope, courage, humor, and seed potatoes.

The political and business worlds tend to concentrate on material values, which are the themes of budget debates and most societal conflicts. Clearly, therefore, what we have in our modern society is a conflict of values.

A KLONDIKE IN NORTHERN NORWAY

Let us now apply this perspective to the conflicts envisaged in northern Norway. Norway is entering the so-called European single market. By doing so, the northern countries will increase the European population by 5 percent and the land area by 50 percent. The pressure introduced will be tremendous. For example, in a recent European Community research paper, the Barents Sea is called the “New Middle East” because of its oil and gas resources and the “New Ruhr” because of its mineral resources, most of which are in Russia. It is the richest northern area in fish and forest resources, and it is the richest European area in material resources. So, Norway will have a choice in nature resource development between creating a “Klondike” scenario or taking a more environmental approach. In five areas, we can already see alarming threats to northern Norway:

1. Two years ago, we had the fisheries crisis. We did some dramatic things about it, and for now the Barents Sea is probably the only area in the Northern Hemisphere where

fish resources are growing. But we still haven't even fully recovered from the 30-year-old fish crisis.

2. Another crisis is reindeer overgrazing. For the first time in recent Norwegian history, we talk about desertification. An area of about 5,000 square kilometers will turn into desert if something radical is not done soon. Reindeer have been here for hundreds of years and are still important for Norway because they graze on more than 40 percent of the land area.

This problem really started when modern society began "helping" the Sami people. With the government agreement in 1978, a lot of money and machinery were available. Modern Norwegians built fences and "privatized" grazing land. The people who gained from this were those who produced the machines in Germany, some of the Sami people who owned the fencing materials and central *abattoirs*, and those who rented cars or helicopters. But today, those whose living depends on the reindeer are going to feel the tragic effects of reindeer overgrazing, and then the situation will move from crisis to catastrophe.

3. Another problem is oil production, which is obvious in the wake of the *Exxon Valdez* accident. The Arctic is vulnerable. Yet, Norway may open up the northern Barents Sea for oil production. The head of the Central Bank in Norway said an interesting thing about this. He is an old man and says he is happy he doesn't have to live to face his grandchildren and try to explain why Norway wasted its oil, burning up everything in one or two generations, and leaving behind an unstable climate and holes beneath the ocean. Why must we hurry into a situation in which no one can guarantee what would happen if there was an oil spill in these vulnerable areas?
4. Tourism has grown bigger than the world's oil industry, and it could be something positive for nature, unlike the oil industry which is basically negative. However, the tourism industry will double in size in less than ten years in Norway and could be a potential threat to the environment. So, we need a "speed limit" on growth, and we need quality control. People from the Mediterranean and the Alps who have dealt with the onslaught of tourism in their own countries tell us that the worst threat to the environment is the so-called green tourism or ecotourism. Such tourism affects

vulnerable areas and uses more transportation to get there. Our challenge is to redefine green tourism.

5. Last, but not least, is global pollution. In the North, we are becoming the world's waste basket. Organic chlorine, nuclear waste, and acid rain filters into the North from other areas. Together, these represent a serious threat to wilderness, people's homes, and fishing areas.

The northern Norway coastal fisheries have been viable for hundreds of years and are today probably one of the few viable coastal fishing cultures left in Europe. With all these serious threats just outlined, I am ashamed that the European environmental movement thinks hunting 200–300 minke whales is the biggest environmental issue in Norway. There are at least 20 better reasons to boycott Norway.

We are losing our sense of proportion. I'm not against hunting minke whales, but it's not my task to defend hunting them either. The Norwegian Society for the Conservation of Nature accepts hunting and feels that it is sustainable to hunt as few as 300 out of 70,000 minke whales. We could, of course, discuss politics and animal rights as opposed to environmental movements, but I will leave it at that and rather return to the real threats.

Our choice now is to have a Klondike or controlled sustainable development. There may be some remnants of Klondike ideology in Alaska. Basically, *Klondike* means "making economic growth the one and only goal, including exponential economic growth" and is characterized by enormous nature destruction, loneliness, and violence. Today, some Russian areas are like Klondikes.

In conclusion, I quote a Danish man who said: "The best thing about Norwegians is that it is so far between them." In Norway, the abundance of nature and wild country means that we live closer to nature and other creatures. And this, together with the fact that we are living on the outskirts of Europe, means that Norway has never really been part of the European feudal society. However, we have experienced life in traditional fishing and Sami villages, and these cultures are now starting to lose control of the local resources. Their livelihoods (i.e., their *lives*) are threatened.

Perhaps it is possible to implement some type of traditional natural-resource management knowledge as a counterbalance to the Klondike approach. We know that the potential for thoughtless exploitation is quickly rising, and against this we must launch the environmental approach. To do this, we need an alliance between coastal fish workers, Sami people, and environmentally conscious people, working together for a system that supports a balance of wild *and* human nature.

Section II



**WILDERNESS
AND PEOPLE**

Indigenous Peoples— North and South



*A Dolgan man of the Taymyr
Peninsula. (Photo by Peter Prokosch.)*

INDIGENOUS PEOPLES OF THE NORTH

Ole Henrik Magga

When we discuss indigenous peoples, be it in the Arctic or elsewhere, we need to emphasize the plural form of the word *people* because each indigenous group is a distinct people. According to the Worldwatch Institute's "State of the World," some 4,000 to 5,000 indigenous cultures exist around the world, representing some 190 to 625 million individuals and 50 Arctic indigenous languages. The United Nations Secretary General, in his inauguration of 1993 as the International Year of Indigenous Peoples, stated that indigenous peoples comprise over 300 million individuals across the globe.

The variation in these figures is due to the way in which the term *indigenous peoples* is defined. The most widely accepted definition is the one used by the International Labor Organization, of which Norway is the only Arctic country to have ratified. However, the situation with Arctic indigenous peoples is reasonably agreed upon.

When one considers the relationship of indigenous peoples to the wilderness concept, difficulties quickly arise. Professor Jens Dahl at the University of Copenhagen prepared a background report on Arctic indigenous peoples for the Nordic Council's Arctic Conference in Reykjavik, Iceland, in 1993 in which he stated: "The use of notions like the 'Arctic wilderness' or 'Arctic frontier' violates fundamental territorial and cultural rights and aspirations of indigenous peoples."

The fact of the matter is that all Arctic indigenous peoples have been colonized, and by describing indigenous peoples' land as wilderness, the colonizing peoples and states maintain legitimacy for themselves to do what they want to the land and to the peoples living there. But each square meter of the Arctic belongs to, and is an integral part of, an Arctic indigenous culture. The term *wilderness* is simply ethnocentric, and people who take seriously the appeal from the Secretary General for "a new partnership" with indigenous peoples should avoid such terms all together.

THE INDIGENOUS PEOPLES

Almost all the countries bordering the Arctic—the United States (Alaska), Canada, Denmark (Greenland), Norway, Sweden, Finland, and Russia—have indigenous peoples living within the region. Drawing from Professor Dahl's report, we estimate the numbers of these peoples as follows:

- The indigenous groups in Alaska include the Inupiat and Yupiit, Aleut, Alutiiq-Aleut, Athabascan Indians, and Pacific Indians. The total native population was 85,698 in 1990.
- In Canada, the indigenous peoples include the Indians in the Yukon; Indians, Metis, Inuvialuit, and Inuit in the Northwest Territories; Inuit and Cree Indians of Quebec; and Indians and Inuit on the Labrador Coast. The indigenous population of the Northwest Territories is approximately 30,000.
- In Greenland, the total number of ethnic Greenlanders was 47,187 in 1992.
- In Scandinavia, the total number of Sami people is between 70,000 and 100,000.

- The total number of individuals belonging to the officially recognized Small Peoples of the North and Far East group in Russia was around 170,000 in 1989. In addition, there were 382,000 Yakuts, 344,500 Komi, 18,000 Kamchadals, and a small number of Veps and Izhors in Russia.

The Situation of Indigenous Peoples in the Far North

The history is, in principle, the same everywhere in the Arctic: people from outside began their invasion with trading, plundering, and missionary expeditions, and they created borders without asking our peoples. As a consequence today, Arctic indigenous peoples have little control over their land and the exploitation of resources. Clearly, establishment of modern sovereign states in this northern region has not ensured that indigenous peoples can preserve their cultures and ways of life, nor has it preserved the Arctic environment. We assert, therefore, that this political exercise has been a failure.

It was not until the latter part of this century, and even later in Scandinavia, that the political authorities in these countries began to listen to indigenous peoples' aspirations and demands. It is remarkable that the Nordic countries are the last of all the Arctic states to formally acknowledge the existence of indigenous populations within their borders. This did not happen in Norway until 1987 and Sweden until 1992.

Nevertheless, the Arctic peoples have remained loyal to their states, and their ambitions are limited to finding rules and procedures that preserve their cultures, especially the material basis of their cultures—the land. A common characteristic of the land-rights problem among indigenous cultures is that the Arctic states have not recognized collective rights. In most cases, the governments have not even wanted to know how the original inhabitants of the areas used the land before the colonists arrived. The Norwegians began selling indigenous land at the end of the eighteenth century. And, at the beginning of the twentieth century, according to Norwegian legislation, the Sami people could not own land unless they gave up their mother tongue. To this day, none of the Nordic states have found solutions to the problems of land and water rights.

For all indigenous peoples, their relationship to the land is fundamental. The Earth is their mother and has a physical and spiritual dimension. The physical dimension is obvious because indigenous peoples drink the water from the rivers and eat the animals and herbs from the land. However, local and global pollution is gradually turning the environment into a nightmare, and most Arctic areas are already affected. The spiritual dimension is found in respecting the ancestors who rest in the soil.

The most difficult environmental situation is in the Russian North. Large

areas are rapidly becoming unfit for human life. The Novaya Zemlya is one of those sad examples where nuclear-bomb testing has led to the evacuation of the indigenous peoples in the area. Radioactive waste is widespread in the waters and the earth. Other well-known examples are the effects of the *Exxon Valdez* oil spill on the indigenous Alutiiq shores of Prince William Sound and Kodiak Island. And, the effects of the Chernobyl accident on Sami reindeer herds cannot be forgotten.

The surprisingly similar histories and development policies pursued by the Arctic states have led to a number of similar social and cultural problems or maladjustments for indigenous peoples. Professor Dahl listed the most outstanding problems as: high rates of alcohol abuse and accidental and violent deaths; high incidence of suicide; loss of the mother tongue by adults and children; a defeatist attitude towards the future; and passivity towards finding solutions to problems. In short, many of these peoples are losing their will and courage to survive.

SELF-GOVERNMENT STRATEGIES

The struggle to strengthen the political position of Arctic peoples has yielded some favorable results. Professor Dahl mentioned three main models of self-government strategies found in the region:

1. *Regional Self-Government*—The most far-reaching regional self-government model is the Home Rule, established in Greenland in 1979. Individual rights are defined based on residency and not ethnicity. A similar system (called Nunavut Territory) is being developed in Canada, but it seems to have far less political power and authority than Greenland's Home Rule system.
2. *Land Claim Agreements*—In Canada and Alaska, land claim agreements were introduced in the 1970s. The parties to these agreements are groups of indigenous peoples and governments, and the core issues concern economic and ownership rights to selected lands. The most extreme of these agreements is the Alaska Native Claims Settlement Act (1971), which is strictly limited to ownership rights. Through the declarations of this act, natives own 11 percent of Alaskan lands. In return, all native rights to other areas, or in sectors other than economic ownership, have been extinguished.
3. *Ethno-Political Self-Government*—This type of self-government, as defined by Professor Dahl, means that specific rights are assigned to specific groups of people if they are the

original inhabitants of a particular area. The tribal-council system in Alaska is an example of this type of self-government. The Sami parliament system in Scandinavia is also similar to this type of self-government and is further combined with rights to reindeer herding found in Norway and Sweden. But, so far, the Sami parliaments have only advisory powers and are not efficient in preserving and promoting Sami culture, although Norway has a special section in its constitution on Sami culture and language.

FUTURE PERSPECTIVES

As seen in these examples, there has been some positive national and international development of benefits for indigenous peoples during recent decades. In a few countries, the rights of indigenous peoples are being defined and protected by law. Indigenous rights have been outlined in various international settings: the International Labor Organization Convention 169; the United Nations Draft Declaration Concerning the Rights of Indigenous Peoples; the United Nations Year of Indigenous Peoples; and the United Nations Council on Environment and Development's Agenda 21, Chapter 26.

However, there are also new development initiatives such as the Arctic Cooperation on Environment and the Barents Region Cooperation that threaten to overrun these peoples and their interests. Furthermore, international trade agreements such as the Energy and Environmental Analysis (EEA) agreement and European Economic Community negotiations do not take into account indigenous interests. Of the Nordic countries that have entered into negotiations with the European Community, only Norway has considered Sami interests. Both national states and powerful international organizations deeply interfere with indigenous hunting and harvesting practices. Combined with increasing environmental degradation, these encroachments have cumulative effects that threaten to disintegrate the last indigenous communities.

A positive development in the Arctic presupposes a mutual understanding and respect among all peoples, both indigenous and nonindigenous. And, there is an urgent need in national legislation and international law for strong guarantees for these peoples. They should also be given the opportunity to take active part in the meetings where future Arctic development is on the agenda and important decisions that affect them are being made. And finally, there should be a permanent arrangement for indigenous representation in international organizations, with the United Nations being the most important. All human beings have the same right to life, even if some had the bad luck to be born as indigenous peoples.



THE CONCEPT OF WILDERNESS AMONG THE INDIGENOUS PEOPLES OF THE NORTH

Evdokija Telekova

The Nenet people inhabit the northern territories of European Russia, and I want to share with the world where my happiness is. The mood of my people is paraphrased in the words of one of our poets:

What is tundra, a tunnel through silver snow ...
I want you to know my tundra, I'll be with you until I die.

Many explorers of the North used to write about the Nenet people. Steven Barrow, a navigator from western Europe, explored the northern shores of Voygash Island. He greatly contributed to the exploration of the North and wrote the following words about the Nenet people in his book, *English Travels in Moscow State*, in the sixteenth century:

On the main island, people who call themselves Sami live.
Excellent hunters, they have enormous herds of reindeer. They
use bow and arrow for hunting and shoot perfectly, and they
focus rather correctly.

The Nenet people consider the reindeer a symbol of unity with nature. Nature gave the reindeer to the people, with its skin used for their costumes. Reindeer-skin clothing is comfortable, light, smart, and ecologically and hygienically useful because it massages the body while simultaneously cleaning the wearer's skin.

The Nenet people are children of nature. The tundra gives them food and clothes and helps heal and raise them. The Nenet people treat animals, plants, stones, and natural phenomena as creatures that are capable of understanding humans. For example, a man who meets a bear while hunting doesn't kill it at once, but first talks to it.

We have a saying that if you wonder in what manner the Nenet people live, then you should learn how we live and what we eat. For example, we have many customs connected with various birds. One belief is that wild geese like black dogs, and when the geese see such dogs, they start flying close to the land and make circles around people's homes.

Life in the open environment enables a person to learn and see a lot and has developed the constitution, spiritual outlook, and character of the Nenet people. There is an episode in the novel written by Melnikof called "The Legend of Telne" in which a father explains to his son the main traits of a hunter's character. Already, at the age of nine, Telne is considered a good hunter and had often brought home as many ptarmigan as he could carry. But his father told him that he should only kill as many birds as he could eat. "Remember," Telne's father said, "every animal, bird, and fish also wants to live. Bear in mind that life on Earth is the most precious thing. You shouldn't always take the lives of other living creatures."

The Nenet people mainly receive their food from nature, which is why they respect and care for it. For example, it is forbidden to make noise in the tundra, especially at night when the people and most of the animals are resting. To survive in Nordic conditions, humans must exist in harmony with nature; and, if we preserve the wild nature of the North, we will preserve the indigenous peoples there. However, without fertile lands for reindeer and clean water in the rivers, we will die. As observed by another of our poets:

I'm in love with my country. Here my father was born and died. Here the graceful reindeer comes to put the dawn on the sky. Birds and beasts find freedom here; each tree gives them shelter and peace.



INDIGENOUS PEOPLES AS MANAGERS OF WILDLIFE IN THE NORTH

Caleb Pungowiyi

Like many indigenous people, I have struggled with what would be the best way to convey our message—that we want to be recognized and respected as people whose lives are somewhat different than most of yours. There's so little time now, and we have lost so much. Enough is enough. As indigenous peoples with unique cultures, we must use every means possible to protect and ensure our fundamental and inherent rights to self-determination.

Let me tell you a story from my childhood. I came into this world in a small hunting and trapping camp approximately 60 miles from the small settlement of Savoonga on Sevooghkuk (St. Lawrence Island). In Inuit, *sevooghkuk* means “land wrung out of the waters.” Our legends say the *kianbnuk* (way of life) picked up some land from beneath the sea, wrung it free of water, and placed it on the Bering Sea to form this island.

It was here on Sevooghkuk that I spent my early formative years and learned from my parents and grandmother the values of our way of life. I was taught about the *kianhnuk* that oversees all living beings on the *Nuna* (Earth). I learned that every creature, large and small, has a *daughnabuk* (spirit) that must be respected and honored. It was here that we hunted seals, birds, and other animals and trapped foxes. When we harvested animals from the sea or land, we were careful not to offend the spirits, ensuring that these animals would willingly give themselves to us. Remember, this is in my lifetime, less than fifty years ago.

But here we had a conflict. The church and missionary at Savoonga said that only humans had spirits—souls that would go to heaven or hell. We



were forbidden to acknowledge that animals had spirits and forced to admit that it was evil to believe in animal spirits. But, to this day, I believe that animals have spirits, intelligence, emotions, and the ability to communicate. These beliefs in animals give us our closeness with nature.

I grew up during the period when our elders and tribal leaders set the tone for our community. The community shared together and ensured that no one suffered from hunger, especially those who did not have someone to hunt for them. I grew up not knowing that there was a greater force that laid claim to our homelands, a force that would exercise domination over our lives and the lands, waters, birds, fish, and other animals. In time, the game wardens came and told our people that new laws had dominion and dictated when we could hunt and fish and when we could not.

Since its formation in 1977, the Inuit Circumpolar Conference has fought for the protection of the Arctic environment, our right to live in harmony with nature, and our way of life. We have fought for the recognition and rights of the indigenous peoples to be fully involved in the development of Arctic policies such as that of the Finnish Rovaniemi Process and the American Environmental Protection Agency, and for our further recognition in the Nuuk Declaration. When sometimes failing at the regional and federal level, we have used the international forum of the United Nations and its associated bodies to address our pursuit for recognition as separate indigenous peoples with unique cultures and distinct rights of self-determination.

Following are several examples of where Inuit peoples have responsibility as managers or comanagers of living resources. We established some of the systems in response to events that threatened our culture and livelihood.

In 1977, in response to the proposed ban by the International Whaling Commission on bowhead whaling, the Alaska Inuit formed the Alaska Eskimo Whaling Commission (AEWC). In order to convince civilized society that there were, in fact, more bowhead whales than they estimated, the AEWC developed a sophisticated and technologically advanced system for counting bowhead whales. A subsequent population census showed that we were right. In 1981, the AEWC and U.S. National Oceanic and Atmospheric Administration signed an agreement that gave the AEWC the authority to manage the indigenous harvest of bowhead whales. However, this agreement was not enthusiastically supported by everybody. Some people said that this was like giving the keys to the chicken coop to the fox. This agreement is now seen as one of the most successful resource management agreements in which indigenous peoples manage and conduct research on a living resource.

Another example is Greenland's Home Rule government, whose philosophy is to combine traditional lifestyles and knowledge with modern-day, science-based resource management to create a better system of natural-resource management through cooperation between the central government and local community councils.

Other examples of indigenous cooperative management are: the establishment of local indigenous wildlife councils in Canada; agreements between the Inuvialuit and National Science Board on the joint management of the Beaufort Sea polar bears; the Alaska/Inuvialuit Beluga Whale Committee on joint management and research of beluga whales in the Beaufort, Chukchi, and Bering Seas; the Yukon Delta Goose Management Plan; and many others. In all cases where the government has worked to establish joint management agreements with indigenous peoples, the knowledge and management of the resources has improved. We have made some progress towards controlling our own destiny.

The Inuit are dependent on nature and its bounty, and we must protect them in order to survive. It is a necessity of life.



THE RECOGNITION AND EXERCISE OF INUIT RIGHTS AND RESPONSIBILITIES

Rosemarie Kuptana

In recent years, the Inuit have sought recognition of our rights and for protection and promotion of our language, culture, and traditional lifestyles by focusing attention on the settlement of land claims and constitutional reform processes. We have made significant achievements in these areas, resulting both from the political process and our relationship to our Arctic lands and seas.

The Inuit Taparissat of Canada (ITC) is the national political voice of Canada's 35,000 Inuit. Our traditional homelands encompass a large area, including Labrador, northern Quebec, Nunavut, and the western Arctic. Almost one-third of Canada—approximately 3 million square kilometers of land—is presently under Inuit stewardship.

The ITC's activities include participation in the constitutional reform processes, promotion of Inuit social and cultural interests, and initiatives designed to correct past abuses to Inuit human rights. For example, the ITC, together with other Inuit organizations, has attempted to resolve an outstanding human rights issue concerning the Canadian government's relocation of a group of Inuit families from northern Quebec to the High Arctic in the 1950s. Known as the High Arctic Exiles, these Inuit families suffered great hardship and pain as a result of this forced relocation.

We also represent Inuit on a variety of national and international environmental issues. We are particularly concerned with the increasing levels of pollution in our Arctic ecosystem. Virtually all contaminants found in other regions of the world have been detected in the Arctic. The ITC is, therefore, cooperating with Canadian provincial governments to conduct contaminant and other Arctic environmental research.

The Inuit have lived in the Arctic for thousands of years, and we consider ourselves the custodians of these vast lands and seas. Our custodianship is motivated by our fundamental beliefs about how human beings should relate to the land and how the land should be cared for and used. To preserve our Arctic lands and seas and exercise our rights, the Inuit have dedicated an enormous amount of time and effort to the negotiation of land-claims settlements and to the constitutional recognition of native rights.

Due to these efforts, final land-claims agreements have been made in all Inuit settlement regions except Labrador. Of critical importance to Inuit, these agreements explicitly recognize and protect our preferential and exclusive wildlife-harvesting rights, even within national parks and conservation areas.

Other specific features of these agreements are designed to achieve our basic goals of protecting the Arctic environment, its wildlife, and Inuit traditional harvesting activities. These features include the establishment of wildlife management bodies, introduction of environmental assessment and review mechanisms, institution of land-use planning procedures, and the creation of national parks and conservation areas.

The establishment of organizations, jointly appointed by the Inuit and regional governments, to manage Arctic wildlife populations is an important component of modern Inuit land-claims agreements. The Nunavut Wildlife Management Board, established by the Nunavut Agreement, and the Fisheries Joint Management Committee, created by the Inuvialuit Final Agreement, are two noteworthy examples of wildlife management bodies.

Inuit land-claims agreements also include mechanisms for environmental assessment and review. Within our settlement regions, jointly appointed environmental review boards now provide the Inuit with the ability to set necessary terms and conditions for all development projects. These boards also ensure that projects are carried out with minimal environmental disturbance and are properly monitored from commencement to completion.

The institution of land-use planning procedures is also an important aspect of the resource management regime established by Inuit land-claims agreements. The most prominent illustration of this emphasis on land-use planning is the wide-ranging authority conferred upon the Nunavut Planning Commission by virtue of the Nunavut Final Agreement.

Another area of focus for claims agreements is the creation of national parks and conservation areas. For example, the Inuvialuit Final Agreement established the North Yukon National Park and a special conservation regime throughout the Yukon North Slope. Several national parks and conservation areas have also been established through the Nunavut Land-Claims Agreement.

These land-claims settlements represent a great achievement for the Inuit, who now confidently exercise harvesting rights, manage wildlife populations, and influence development plans and proposals. However, these agree-

ments have some limitations. For example, they have not provided for recognition of the inherent right of Inuit self-government. An inherent right cannot be given or taken away. It is a basic human right that collectively belongs to a people rather than to individuals.

As stated in the Arctic Policy of the Inuit Circumpolar Conference: "Inuit can only continue to develop as a distinct people by exercising adequate powers of self-government within their traditional territories. Inuit have the right to determine their own institutions, according to the circumstances and needs in their respective regions."

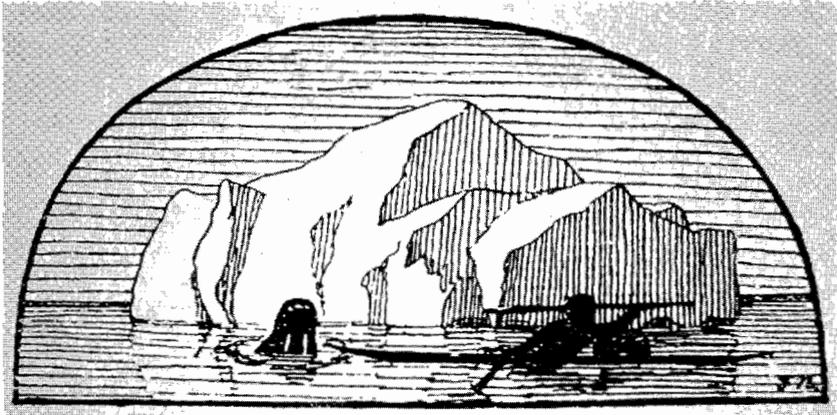
To ensure that we can determine our social, cultural, and economic development, the Inuit have for many years aggressively pursued the entrenchment of our inherent right to self-government in the Canadian Constitution. The constitution of a country is its highest law. Other laws and all government actions must conform to this constitution. The existing constitution divides all governmental powers and authorities between the federal and provincial governments. Other governments can only exercise powers delegated by or "borrowed" from either the federal or provincial branches.

Throughout the 1980s, the ITC and other native organizations made several unsuccessful attempts to entrench our inherent right in the constitution. In 1991 and 1992, the ITC again became significantly involved in a national process to reform the Canadian Constitution. For the first time in Canadian history, the Inuit participated as an equal governing body to the federal, provincial, and territorial governments. In October 1992, the inherent right of Inuit self-government and other native rights were included in an agreement to amend the Canadian Constitution. This agreement is known as the Charlottetown Accord. Although the Inuit overwhelmingly supported the accord, it was defeated in a national plebiscite.

Because the accord did not create a law to protect the inherent right of Inuit self-government, we remain excluded from the division of power, which is in itself an exclusion of our right to self-government and a violation of our basic human rights. Despite the failure of the Charlottetown Accord, the Inuit and other native peoples achieved important gains through the process, and we will continue to aggressively seek recognition of our inherent rights in the Canadian Constitution.

Although the Inuit have adapted to the modern world, the Inuit language and culture remain strong, and traditional wildlife-harvesting practices are being maintained. This traditional lifestyle is based upon a dynamic and interdependent relationship between humans and other living beings that must be continually renewed and sustained.

This relationship is better understood by explaining Inuit views on seal hunting. The seal willingly gives itself to the hunter who shows the proper respect for the natural world and its living beings. By following certain harvesting



Ink drawing by Fridtjof Nansen. (Courtesy of University of Oslo.)

rituals and sharing with kinship and community, the hunter demonstrates proper respect. Through this culturally appropriate behavior, not only are the hunter's relatives and friends nourished, the soul and spirit of the seal is allowed to return to the sea and be reborn. The relationship between human beings and animals, therefore, sustains and renews both human and animal populations.

This traditional perspective also distinguishes many modern Inuit accomplishments. As discussed, Inuit land-claims agreements provide for the creation of national parks and conservation areas. The Inuit invite other people to enjoy the beauty of these areas, but to the Inuit, these areas are not to remain forever untouched by human beings. Instead, our conception and use of these areas recognizes our interdependent relationship with other living things. Therefore, provisions are included in our land-claims agreements that allow traditional harvesting activities within national parks and conservation areas. To the Inuit, it is not possible to exclude or sever the interdependent relationship between humans and other living beings, and we cannot accept the concept of "untouched wilderness" proposed by many non-Inuit peoples because we believe that this concept represents an artificial and sterile view of the Arctic.

During ITC's twenty-year existence, the Canadian Arctic has experienced rapid and dramatic changes. Through land-claims agreements and constitutional reform processes, the Inuit have been able to protect their traditional harvesting practices and other rights, regain substantial control over how they live, and reassert their responsibilities to the Arctic environment. Although these achievements are remarkable, much work remains to be done. Building upon past successes, Inuit self-government will soon be a reality.



THE INDIGENOUS PEOPLES OF THE ARCTIC—SURVIVAL DEMANDS

Henriette Rasmussen

Arctic indigenous peoples can be described as the “circumpolar culture.” They inhabit the upper part of the hemisphere in areas north of the natural tree line in northern Scandinavia, Siberia, Alaska, Canada, and Greenland. The type of landscape in which Arctic peoples live varies from southern boreal forests to Siberian taiga and High Arctic tundra.

In the Scandinavian Arctic, the Sami people are the native population, while twenty-six different peoples live in Siberia, including Samoyeds, Evenki, Nenets, Yukagirs, Koryaks, Chuktchi, and others. My people, the Inuit, live in the Arctic regions of North America and Greenland. The Dene and different Algonquian-speaking groups such as the Cree and Nascapi live in the boreal region.

The Greenland Inuit are the indigenous peoples of Greenland. We are an old people, related to the Canadian, Alaskan, and Siberian Inuit. Currently, there are 55,000 Greenland residents, with the majority of the population being Inuit (approximately 85 percent). We live mainly on the west coastal areas of the island.

Traditionally, subsistence is the Inuit’s way of life and has been recorded as a means of survival for our ancestors throughout our history. For thousands of years, our people have depended on hunting seals, walrus, and whales from the sea and caribou, foxes, and, in some areas, musk oxen and polar bears, from the land. Fishing and duck hunting have supplemented our diet.

My people were self-supporting with little or no outside trade until European whalers and Christianity came to our country in the early 1700s. The dog sledge was the only means of transportation in the winter, while the



Subsistence fishing. (Photo by Tapio Tynys.)

qajaq (kayak) and *umiak* (an open, hide-covered, wooden boat) were used in the summer.

Survival today has not changed from our traditional way of life. We are still highly dependent on fishing and hunting sea and land mammals in our ecosystem. Our survival has always been a struggle under the harshest conditions. During the winter, we experience severe cold temperatures. Our survival techniques were used for the most famous polar expeditions. It is no wonder to us that even the most advanced technology has failed, often with fatal and tragic results; for example, the *Titanic* shipwreck and the Franklin expedition.

Today, Greenland is a modern society, with its own Home Rule government and parliament. Since the 1800s, our culture and language have survived the European invasion. Our native tongue is the main language spoken and taught in our schools, and we have a 98 percent literacy rate.

However, we face an alarming unemployment rate due to the decline of the cod-fishing industry and the sealskin ban in the United States. Currently, our main industry is prawn fishing.

My people are also skilled artisans. Traditionally, hunting supplemented our income and continues to do so today, but the bans on ivory and sealskin have forced us to abandon the crafts that once sustained us. Today, because we have lost that income in the outlying villages, many Inuit have moved to urbanized areas and live in poverty. This seriously threatens our culture.

Greenland is situated in the middle of the North Atlantic Ocean—between North America and Europe—which means that our renewable resources are shared with these two continents. This places great demand on the joint

sustainable management of these resources. The resources we have in Greenland can hardly be managed or utilized without looking to what happens outside Greenland.

For example, the bird species we eat and otherwise utilize for our living today—mainly guillemots, kittiwakes, eiders, and king eiders—are shared with other countries. The guillemot population is shared with Norway, Russia, Iceland, and Canada. The kittiwakes are shared among all the North Atlantic countries; and eiders and king eiders are shared with Canada. Hooded seals, ringed seals, belugas, narwhals, and the polar bears on the west coast of Greenland are also shared with Canada.

Greenland receives small annual hunting quotas for minke and fin whales from the International Whaling Commission (IWC) (approximately 420 tonnes of meat, while the need is 670 tonnes). These quotas are granted under the aboriginal subsistence whaling provisions of the IWC.

Greenland's terrestrial mammals are musk oxen and caribou. Both are of great importance to the Inuit. They are used for food and cultural purposes. There is currently a two-year ban on caribou hunting to preserve the stock, which limits the Inuit meat supply. We have strategically relocated stocks of musk oxen to various areas in Greenland to increase their population for future use.

Our fish resources are mainly cod, halibut, and char. Unfortunately, the cod has nearly disappeared in recent years. The stock around Greenland is dependent on cod fry from the banks around Iceland. Until 1992, limited harvest of Atlantic salmon was taken, but for the next two years, only subsistence fishing will be allowed.

Greenland's greatest and only export revenue comes from prawns, catches of which are subject to tight restrictions. A small revenue is also earned from scallops. Two other native species, common mussels and Greenland crabs, are not used commercially.

The Greenland Home Rule bases its regulations for management of the renewable resources on scientific research. Temporarily, the Greenland Home Rule has started coordinating and collecting traditional knowledge among the local hunting and fishing population to combine with scientific information to create a better overall management regime.

We abide by the directives of the Ríó Declaration: sustainability in harvest and management of natural resources. The Ríó Declaration is a 1992 charter that reaffirms its commitment to sustainable use and the continuing ability of indigenous peoples to make a living from the resources available to them.

We have done and still do our own natural resource management in close cooperation with international biologists. Regional or international management agencies sometimes analyze land use, sea mammals, and fishing resources when an area or species is threatened.

One example is the Joint Commission on Narwhal and Beluga between Greenland and Canada, concerning biological research on the Baffin Bay and Davis Strait narwhal and beluga whale stocks. The data gathered will determine the number of whales to be harvested.

It is important to Greenland's Home Rule government that consultative management of the living resources is based on traditional knowledge of the local people about their hunting and harvesting methods and scientific data. This management program considers both the animals and the Inuit hunters. For the management program to be successful, we need to know: (1) scientific data, (2) traditional knowledge, and (3) hunting conditions.

NATURE CONSERVATION AND MANAGEMENT LEGISLATION

The Nature Conservation Act of 1980 was followed by the Environment Protection Act of 1988. Both acts are built upon the old traditions of local fish and game management and the present hunting and fishing conditions.

There is also a basic law on hunting for capital income and another for subsistence hunting, adopted in 1984, which are both supplemented by specific bylaws and municipal regulations containing rules on fishing, whaling, and hunting caribou, musk oxen, and sea birds. The regulations are based on:

- advice from both domestic and international biologists;
- traditional knowledge from hunting communities; and
- advice obtained in forums: international (e.g., Oslo Convention, IWC, and World Conservation Union), bilateral (e.g., Joint Commission on Narwhal and Beluga), and multilateral (e.g., North Atlantic Marine Mammal Commission).

National Park, Nature Reserve, and Ramsar Designations

In 1974, the Danish parliament instituted a national park in northeast Greenland; and in 1987, the Greenland Home Rule increased the size of the park. It is the largest national park in the world—bigger than Great Britain and France combined.

In 1980, the Danish parliament instituted a nature reserve in Melville Bay, which the Greenland Home Rule further extended in 1989. Ramsar sites (wetlands deserving special protection as recognized by Ramsar treaty) have also been instituted along the west and east coasts of Greenland, covering 10,500 square kilometers.

Minimal subsistence hunting is allowed in the reserves, park, and Ramsar

sites, according to local municipal rules. There are also reserves that aim to conserve caribou and other local wildlife populations.

Perhaps the Greenland situation seems easy and not problematic. It is not so—we still want to develop and manufacture products from our hunting. We want to educate our youth about managing our environment in accordance with the commitment we feel we have as an indigenous people and also as members of the world community.

After the fishing industry became the main source for Greenland's economy, the technological development of river and ocean fisheries rapidly increased. Because of this, hunting activities suffered in economical development. In addition, this stagnation was influenced by the international resistance to seal and whale hunting. Effects of the antisealing campaigns in the 1970s still impact Greenland's export of sealskins, and this is expected to continue for many years.

Influential environmental groups have used their high profiles and substantial resources against many of our traditional means of livelihood. Their relative advantages of global mobility, size, and accessibility to information and the media have placed us at risk of losing our traditional way of life. Northern peoples who face boycotts and hunting and fishing quotas find it difficult to maintain a subsistence lifestyle.

The main threats to the survival of the Inuit culture come from the industrialized world, which already has high technological development. One threat is the environmental movement's campaign against the use of renewable resources. These are hard-hitting campaigns that are not in accordance with international agreements regarding the right to sustainable use. This is a threat to our human rights. The other and more serious threat is transfrontier pollution that comes from the industrialized countries in North America and Europe. This pollution (e.g., ozone-depleting substances, environmental poisons, and radioactive wastes) often collects in the Arctic.

It is important that the international community reaffirms its commitment to sustainable resource use and the continuing ability of indigenous peoples to make a living from the resources available to them. The world community must understand that we can manage our own affairs, and need less help from outside, if our rights are respected.

If interference such as that mentioned above continues, it will totally destroy the livelihoods of Arctic indigenous peoples and the Arctic environment. We want to cooperate, but we also want respect for our lives and lifestyles.

The Inuit concept of wilderness can best be described as *Pinnngortitaq*, meaning "The Creation." We, the people—the Sami, Nenets, Koryaks, Dene, Cree, and Inuit—cannot be separated from the *Pinnngortitaq* because we are part of it. In this way, our natural surroundings, our "wilderness," are taken care of and not controlled by humanity.



AN AUSTRALIAN ABORIGINAL APPROACH TO WILDERNESS

Mervin Franks

I am a member of the Wakka Wakka people of northeast Australia, one of Australia's aboriginal peoples. My people have inhabited our great island continent for over 50,000 years. Our culture is considered the oldest surviving culture in the world.

With the arrival of the British colonists in 1788 began the massive crescendo of plunder, massacre, enslavement, and dispossession of our land. The loss of our land meant the destruction of our economy and much of our culture.

We share a similar history of invasion called colonization, which was associated with the European pattern of expansion, with many indigenous peoples throughout the world. This expansion barbarously eradicated what existed before. We have witnessed the terrible degradation of the lands we cherished and nourished for countless generations.

Only recently, in the past twenty-five years, has the struggle for our rights, including the struggle for our land and the difficult and long struggle for justice, brought some results. We are now witnessing a remarkable resurgence in our culture. In 1992, the Australian High Court overturned the legal basis on which Britain occupied our land—the doctrine of *terra nullius*, meaning “no one's land.” After 205 years, Australian law has finally recognized that indigenous peoples owned their land during the European settlement. This recognition has far-reaching implications. We are now engaged in a major struggle for our land rights. We remain optimistic that justice will prevail, and that the High Court's decision on native titles will be implemented.

The fact that the British believed that the continent did not belong to anyone is a stark example of their gross misunderstanding about the special relationship we have with the land. They saw the land as an empty wilderness, and our people were just incidentals on that landscape. Their concepts of wilderness and land ownership are so different from the ones we hold. Our early people lived in the “wilderness” and were part of it. Over the millennia, my people flourished and developed a highly ordered civilization based on spiritual values. How could the Europeans of the eighteenth century, with their belief in the superiority of their race and material progress, possibly understand? These people were determined to exploit the land and its resources and conquer and tame the wilderness. They were determined to amass great material wealth at any cost. After just two centuries, they have managed to destroy much of the natural environment.

The Australian continent is comprised of an enormous range of environments, including rain forest, tropical coast, open scrub, alpine mountain, and desert. Aboriginal peoples once lived in all these environments and today continue to live in most of them.

European settlement severely disrupted aboriginal life in most Australian regions. When the Europeans first came to our continent, Australia was still a wilderness. Even the central deserts contained adequate vegetation. It did not take long before the land was cleared for grazing, agriculture, and mining. Sadly, only small pockets of the ancient wilderness remain. A wilderness once nurtured by hundreds of generations of aboriginal peoples has all but disappeared.

This has had a terrible effect upon our people. In order to understand this impact, one needs to understand something about the spirituality behind some key aboriginal concepts. Our people were animists. Everything in the environment had its proper place. Everything in the environment had meaning and was given due respect. Despite two centuries of European colonization, which crushed our religions and languages, there has been a revival of our spiritual beliefs. Not all has been lost.

The aboriginal concept of creation is that in the beginning all things, including animals and plants, were human beings. These were the progenitors of humans that turned themselves into animals and plants and sank into the earth to become the natural features of the landscape and the spirit homes of our ancestral beings.

Disguised in the language of astrophysics and geology is the essence of our Dreamtime Creation, our cosmology. The active fields of the Dreamtime Creation are the fields of the unconscious. Our cosmology reflects the internal elements of dreaming, which is a sophisticated system of knowledge, beliefs, and practices concerning the creativity of ancestral beings. This rich



"Kunia, the Quiet Snake at Karrilwarra," 1990, George Tjungurrayi. Acrylic on canvas, 137 cm x 91 cm.

cosmology provides the means through which every individual is bound—from before birth to after death—to an intimate personal identification with the land and its special sacred sites. This deep spiritual bond with the land also determines all our economic and social relationships. It is the essence of our life. This is all difficult for the European mind to comprehend, and now even for the dominant, contemporary Australian mind, with its traditions of individualism and rationalism.

From this background, it is evident that, if there is such a thing as an aboriginal approach to wilderness, it would be different from the European one. It is also difficult to determine whether there is even a concept of "wilderness" among aboriginal peoples or even a single approach shared by all aboriginal peoples.

First of all, Australian indigenous peoples have many cultural differences. The Aboriginal and Torres Strait Islander Commission represents two distinct indigenous groups—the aboriginal peoples who live on the continent and the Torres Strait Islander peoples who live on the islands between Cape York Peninsula and Papua, New Guinea. Not only are these two groups different, but there are also differences within each group. For instance, when the British came to Australia in 1788, they believed there was one aboriginal culture with up to seven hundred language groups. Today, my

people think of themselves as several hundred distinct cultural groups. Generalizations about us can be hazardous and misleading because they emphasize the similarities that exist among the many groups and exclude significant differences.

Because there were traditionally many different groups of Australian aboriginal peoples, there was, and is, no single aboriginal concept of wilderness, just as there is no single European concept of wilderness. The irony and hurt for many aboriginal peoples is that the land many Europeans call *untouched wilderness* is the land that, for instance, the Ngarinman people of the Northern Territory call *quiet country*, meaning “tame, domesticated, not dangerous, and under control.” Aboriginal peoples may not actually have a concept of wilderness, but a strong, special connection exists between our people and their landscape.

Aboriginal peoples believe that there is a direct connection between themselves and their ancestral beings. Because they also believe that the land and their ancestral beings are inseparable, they consequently believe that there is a direct connection between themselves and the land.

Galarwuy Yunupingu, chairperson of the Northern Land Council, describes the land as “a foundation that gives me the identity that I belong to something from which my spirit actually came out of, and it is also a structure in which everything is connected.” Thus, what is “wilderness” to



Kakadu men in Kakadu National Park, Northwest Territories, Australia. (Photo by Bill Neidje.) From the exhibition “Friendly Country, Friendly People.”

non-aboriginal peoples is *home* to us. *Terra nullius* was the doctrine that declared my ancestors' home to be wilderness. In June 1992, the High Court rewrote history by overthrowing this legalized error.

There is definitely a sense of wilderness among aboriginal and Torres Strait Islander peoples. For the aboriginal to feel at home, the land must be filled with religious affiliations and names of totemic ancestors, and he or she must serve as an immutable link between the land, the people, and the supernatural world. Without this, the aboriginal's life is devoid of meaning.

The aboriginal also believes that lack of human spiritual rituals leads to the deterioration of the environment because the people lose their special attachment to the land, which gives them identity, and the land becomes a remote wilderness. This is not to say that the wilderness is remote in time or space from human habitation, but remote in its spiritual values.

There is an urgent need to end divisiveness and confusion over native land claims and ensure that the Australian High Court's decision on native titles is implemented. A hopeful sign recently occurred when the major Australian environmental groups strongly spoke out on these issues.

The Australian Greens (represented in the Australian Senate), Australian Democrats (also represented in the Senate), Australian Conservation Foundation, Greenpeace (Australia), and the Wilderness Society called upon the Australian government to create a systematic and uniform process of determining native titles. They issued a joint statement calling for a strong, consistent, and national approach to native titles and compensation for land taken from us, and supported a comprehensive social justice package for aboriginal and Torres Strait Islander peoples who cannot claim native titles under the terms of the High Court decision, including funding for land acquisition, cultural activities, formal education and training, and employment. The environmental groups also joined with churches and trade unions in support of our struggle for land rights against some powerful commercial and political groups.

Australia now has the opportunity to right the wrongs of the past and bring about justice for its indigenous peoples who have been devastated by colonial domination for centuries and whose suffering must stop.



INVOLVING TRADITIONAL KNOWLEDGE AND RURAL PEOPLE IN WILDERNESS CONSERVATION

Windsor Shuenyane

In order to appreciate the role that traditional knowledge can play in wilderness conservation, it is necessary to go back in history to precolonial times and explore the finely balanced relationship that traditional African societies enjoyed with nature and examine the traditions that governed natural resource harvesting and ensured that wanton destruction did not occur.

In those days, great wildlife herds roamed a continent of vast grassland, rich vegetation, and abundant rivers and wetlands, with coastal waters teeming with shoals of fish. Even the arid lands of southwestern Africa were able to sustain tribes of indigenous people with their hardy vegetation, sparse wildlife, scarce water holes, and unpredictable weather.

A study of the *Batswana* (people of Botswana), for instance, emphasizes the fact that because they had to survive off nature, they had to live in complete harmony with nature. In order to maintain this harmony through the ages, they evolved a highly effective conservation ethic that, in the absence of the written word, was expressed in taboos, totems, and customs that were passed on from generation to generation through various traditional institutions (e.g., initiation schools).

At initiation schools, a great deal of attention was given to the naming and identification of plants, animals, and birds. The end result of this was that all adult tribal members knew the name of every plant, animal, and bird in their area. They were also familiar with the laws, taboos, potential uses, and dangers associated with these living beings.

With regard to wildlife laws, all authority was, by tradition, vested in chieftainship. These laws were strict and complex, yet rational and based on sound principles. This is best illustrated in the laws pertaining to trees. Because of their many uses ranging from shade, fuel, and construction to providing food and medicine, most trees could only be felled with the express permission of the chief. This was only granted if the area was needed for plowing or when the trunk was needed for making maize- and sorghum-grinding vessels. Green branches for home construction could only be cut in winter, and firewood could only be collected from deadwood. For medicinal purposes, bark could only be collected from the east side of a tree, thus ensuring that the tree was not ring-barked and, therefore, killed.

Rare and ecologically important species were protected by tribal law, and the utilization of common species for the benefit of the tribe was wisely controlled by the chief and traditional mechanisms. An example of this was the *Letsholo* (traditional game hunt), which was conducted by a regiment of tribal males and controlled by the chief or his representative at intervals determined by him—usually two or three times per year. A number of species like vultures, ox peckers, egrets, secretary birds, pythons, and lizards were protected and reserved solely for traditional healing purposes and never for eating.

As a reinforcement of traditional tribal laws, a number of interesting taboos evolved. For example, frogs, tortoises, and swallows were associated with rain, and hence it was believed that the destruction of these animals would result in severe droughts. In the same vein, it was believed that the felling of highly protected trees would cause natural disasters like floods or hail. It is interesting to note that in today's world of technology, thousands of migratory birds like swallows are killed every year through being attracted to lighthouse beams. Their numbers are diminishing, and they arrive progressively later over the years. Other factors affecting migration include extensive deforestation, drought, and famine.

The totem system warrants special mention because it highlights traditional reverence for wildlife. The totem stood for a complex system of legal and moral customs, rights, and obligations from which unity and solidarity within the tribe were founded. Due to this close dependence on nature, each of the tribes and clans selected an animal species as its totem—usually an animal that they loved, revered, and with which they closely identified. Even today, the majority of tribes, be they urban or rural, continue to religiously observe this tradition. Some totems include the *bakwena* (crocodile), *bataung* (lion), and *bathaping* (fish). My own totem is the *ratlou* (elephant).

Therefore, it must be concluded that to our indigenous societies, the wilderness was sacred territory to be treated with respect, adoration, and

eneration. It was the source of life from which a strong spiritual rapport based on survival and sustenance evolved. In William Shakespeare's words, this is where indigenous peoples found:

Tongues in trees
Books in running brooks
Sermons in stones, and
Good in everything.

WILDERNESS CONSERVATION—THE PROBLEMS

In South Africa, it is a matter of history that the combined impact of colonization, dispossession, industrialization, and the restrictive policies of apartheid forced millions into overcrowded "homelands" where environmental degradation and colonial conservation policies destroyed the traditional values that ensured sustainable use of natural resources. Land-use practices, allocation policies, and heavy-handed conservation legislation resulted in rural people viewing wildlife as a problem rather than a benefit.

The environmental devastation of today is the legacy of these policies, and the biggest concern is that the capacity of southern Africa to support both humans and wildlife may have been irreversibly diminished. At the core of this concern are three fundamental factors:

1. **Population Growth**—Population growth stands at 40 million people at present and is set to double in the next twenty-five years. Discussion on this issue is beset by ethnic sensitivities and deeply held customary beliefs pertaining to the traditional roles of the sexes. This makes the promotion of effective family planning programs a difficult task.
2. **Widespread Debilitating Poverty**—In many parts of the country, approximately 16 million impoverished and over-crowded communities are battling to survive and subsist below minimum living standards.
3. **Land Conflicts**—Land is a highly emotional subject in southern Africa and is the main stumbling block to the implementation of sound environmental management policies. The National Environmental Awareness Council, a black-initiated environmental organization based in Soweto, confirms this observation as follows:



Typical multi-family dwelling in a one-bedroom house in Crossroads, near Capetown, South Africa. The family is forced to sleep in the living area, kitchen, and passageway. Space is a scarce commodity. (Photo by Margot Morrison.)

We question those whose concern for the environment focuses on saving various species of animals from extinction or preserving small areas of land for game parks patronized mainly by whites whose financial status enables them to enjoy nature in its natural state. We also question iniquitous land policies which have impoverished the land and forced people of color to live in degrading conditions.

According to Professor Richard Fuggle of the University of Cape Town, current black views evoke some of the deep political and cultural symbolism of land when they speak of the "spiritual and physical alienation of blacks from the environment" as a consequence of historical land policies and dispossession. The deep-seated desire of our indigenous peoples to reclaim what is historically and culturally theirs must be understood in this context. Dispossession deeply struck into the roots of their identity and self-concept. This process alienated and estranged them from the land, reversing the traditional view of the land as a commodity to love and protect.

It is obvious, therefore, that the rural poor, preoccupied with their immediate needs for food, fuel, fodder, and building materials, care little for intellectual discourses that proclaim long-term benefits from nature conservation. The struggle for survival has plunged the region into a downward spiral of environmental degradation. In short, the “green movement” counts for nothing in rural South Africa.

In such circumstances, Dr. John Hanks of the Southern African Nature Foundation remarked that “environmental ethics are irrelevant, and conservation concerns are a perceived superfluous luxury in the struggle for survival.” The poor have limited choices. They are forced to abandon the needs of tomorrow in order to meet the necessities of today (e.g., being compelled this year to eat the seed corn of next year’s crop).

The result is inevitable. An increasing number of people in a limited area can only exact a heavy environmental toll—the destruction of essential natural resources. “Ironically,” concludes Dr. Hanks, “people in these circumstances are damaging or destroying the very fabric on which they depend for survival.”

IS THERE HOPE?

Yes, there is hope for wilderness conservation if the collective initiatives of nongovernmental organizations, para-statal organizations, and the private sector are given the necessary support to:

- protect the remaining wilderness and near-natural areas in our region;
- highlight these areas as good examples of the sustainable use of natural resources that provide wood for fuel, timber for construction, grass for thatching and grazing, and various plants for medicinal purposes; and
- provide models for the combination of traditional knowledge with the desired intervention measures to save our wilderness areas.

The following two programs are examples of organizations that have been active in community-based natural resource utilization and management. Their selfless exchange of knowledge and technology has contributed much to the development of new conservation strategies that contribute to present and future environmental solutions.

Communal Areas Management Program for Indigenous Resources (Zimbabwe)

The Communal Areas Management Program for Indigenous Resources (CAMPFIRE) is a multisectoral project based on an entrepreneurial approach to rural development. It enables rural communities to manage and directly benefit from indigenous wildlife and uses market forces to achieve economic, ecological, and social sustainability. The CAMPFIRE program has the following six main goals:

1. to rely on the use of indigenous resources rather than on imported technology;
2. to utilize a viable ecological base;
3. to provide an economic base;
4. to enforce a land-tenure system that permits local community control over the land;
5. to implement a community-based management plan; and
6. to highlight immediate benefits that encourage interest.

Project Secure (South Africa)

Project Secure has a philosophy of integrating conservation practices with community development processes whereby rural people are empowered to manage their own wild plant and animal resources within sustainable limits for the social and economic well-being of their community. Developed by the Bophuthatswana Parks Board, the program involves discussions with rural communities to learn about environmental processes and the wise use of wildlife resources in their areas, utilizing the traditional knowledge that has been passed on from colonial times when wild plants and animals were traditionally a valuable resource for tribal societies. Through a process of discussion, debate, education, and collaboration, a growing climate of understanding about current environmental issues has been developed, which has allowed for informed decisions to be made at a grassroots level. For example:

- changing the perceptions of rural people towards wildlife to achieve sustainable rural development and to address the adverse effects of pastoral farming in arid climatic conditions; and
- the nonconsumptive utilization of natural resources through, for example, ecotourism.

Other South African organizations utilizing the same approach to integrating rural communities into the sustainable utilization of natural resources

in their areas include the National Parks Board, the Institute of Natural Resources, the KwaZulu Bureau of Natural Resources, the Kangwane Parks Board, and the Shongweni Resources Reserve (an ambitious project of the Wilderness Leadership School).

Private Sector Initiatives

The private sector has been responsible for interesting initiatives that involve rural people in wilderness conservation, largely through ecotourism programs and the development of private wildlife parks that attract mostly international tourists. These initiatives play a meaningful role in meeting the needs of rural communities and demonstrating another vital facet of ecotourism—economic sustainability.

A good example is the Conservation Corporation that was established in 1990 to develop “discerning” ecotourism destinations in southern Africa. The aim is to consolidate degraded and undervalued land (devastated mostly by unrestricted pastoral farming) under a wildlife management regime and thereby to generate long-term financial returns through ecotourism. The main objective is to apply a balanced approach to tourism, conservation, and local community involvement in the promotion of ecological sustainability.

The corporation secured 17,000 hectares of ecologically important land in northern Natal to form the Phinda Resources Reserve. By 1992, U.S.\$19 million of investment had been raised from around the globe—the biggest private-sector investment in conservation ever made in South Africa. Affirmative action programs are also in place to involve local communities in becoming company shareholders, thereby generating a sense of local ownership.

In addition to extensive land rehabilitation work, the corporation has undertaken a major game-restocking effort. Since March 1991, over one thousand animals, including rhino, elephant, lion, cheetah, giraffe, zebra, wildebeest, and a variety of antelope species, have been introduced into the reserve.

It is important to note the tangible benefits of this effort to the local population. Some 25,000 people reside in the vicinity of the reserve, and 250 others are employed, providing some U.S.\$2 million in annual revenue to the neighboring population.

In its commitment to community development, the reserve has spent U.S.\$650,000 to assist the community with building their own schools, clinics, and social centers. This has facilitated the development of employment- and skills-training projects and provided seed capital for small-business development. Entrepreneurship has flourished, and activities like brick and charcoal manufacturing, craft-making, vegetable farming, transport hire, carpentry, and sewing have been developed in conjunction with the corporation's three tourist lodges.

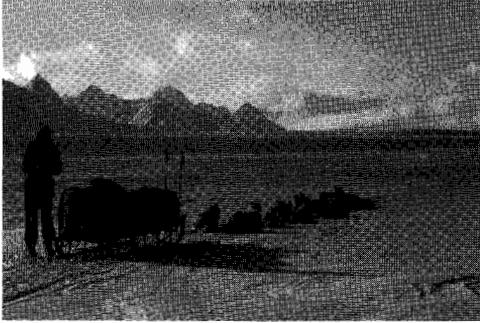
The Conservation Corporation has thus developed a valuable commercial facility that has helped restore and rehabilitate economically sensitive land, restore biodiversity, and institute wise land-use management in collaboration with the local community, which has enjoyed immense educational, social, and economic benefits while taking part in a major conservation effort.

As we approach the end of the twentieth century, we have become acutely aware of what environmental degradation means to all forms of life on our planet. We have gone back in time to previous generations to observe their relationships with nature. Clearly, there is a lot to learn and unlearn. What is important to learn, though, is that in order to sustain and improve the quality of life for future generations, the arid ecosystems of southern Africa need our care and not our abuse. With the enfranchisement of our indigenous populations, we need to restore this traditional and positive relationship, rediscover the wisdom of the past, and adapt it to modern-day circumstances.

Further, it must be acknowledged that the future success of the environmental movement in South Africa is dependent upon the extent to which the majority of the population, especially the poor and illiterate, can be convinced that environmental and conservation issues are not peripheral to their lives, but are a crucial part of their existence. In this regard, much hope can be derived from the initiatives of the various organizations that are trying to save our natural heritage for posterity.

Finally, there is also a strong need in southern Africa to face our spiritual and physical alienation from the environment. This involves exploring how we can enable as many southern Africans as possible to enjoy the sensitizing experiences of the natural world. Although factors like distance and the costs of transportation, entrance fees, meals, and accommodations make it impossible for most people to afford trips to national parks or nature reserves, special programs should be funded to enable all peoples to gain access to and have a share in these areas.

A Source for Inspiration and Transformation



*Exploring the wilderness of Svalbard,
Arctic Norway. (Photo by Robin Buzza.)*

WILDERNESS—OUR LIFELINE ON EARTH

M. A. Partha Sarathy

Permit me to celebrate wilderness for a while. Too many of us tend to think of it only in scientific or utilitarian terms.

I visit a particular pond in a forest from time to time. It is a small pond inside a great forest, and I have a yearning for such ponds. For me, this pond in the forest is like an invitation to my soul.

When I walk in a forest, many things envelop me. My mind is in a maze, and my eyes reach restlessly. The aroma of grass, trees, skies, and distances entice me.

I like reflections. I find them more pleasant than reality. There is a vast grandeur behind a reflection, particularly in the pond in the forest.

Sunset on the pond is a time for me to withdraw my soul from the shackles that the day puts on it and dip my mind into the friendly golden colors of the pond. Then, just before sunrise at this forest pond, morning seems yet unannounced. A soft cushion of mist lies nestled on the pond, guarded by sentinel trees that seem reluctant even to let the birds disturb the air with their morning songs. Then, the mist, warmed by the rising sun, gently gives up its opacity. Birds begin their communal morning song, and frogs begin their solemn morning mass. Ripples dot the pond as more birds lift from the trees.

The forest is really a garden. Many of us think of it only as a massive collection of trees in chaos. But wilderness is not chaos, and chaos is not wilderness. The chaos of wilderness is what brings beauty to the Earth and provides a lifeline for humans on this planet.

My culture has celebrated humankind's presence on this planet, not as man or woman alone, but as one of the great manifestations of nature's magnificent design. I am aware, however, that mine is not the only culture on Earth that has recognized wilderness as a precious lifeline for all life on Earth.

The forest has been called "the soul of a nation," and it is recognized that when the culture of humanity reaches maturity, it must return to the forest, as the source of all life, to rejuvenate itself. However, as humanity continues to sin against the forest, the decline of the source of all life, namely wilderness, is inevitable.

We need a reconciliation between humans and nature, a harmony in which humans live peacefully and coexist with nature. I have traveled through the great world of wilderness on this planet and always come away with, as Laurens van der Post said, "a greater sense of self-identity, as if transformed by a highly sacred atmosphere."

If there is one important milestone in the history of humankind to be bemoaned, it is when humans began to separate themselves from nature. Humans have lost themselves in their own ignorance and apathy towards wilderness.

I am the grandson of the high priest of one of the great places of worship in my country. I believe in all religions. I have worshipped in temples, mosques, churches, and synagogues. I have worshipped in a Shinto temple. My favorite place of worship is in Kyoto, Japan, at the Meiji Temple. I have also worshipped with my Masai friend in Africa, in a small village where he simply thrust his spear into the ground, kneeled in front of it, tilted his head upwards, and worshipped.

But above all, I have worshipped wilderness. I consider it the closest one can come to recognizing divinity on Earth.

What is one looking for when one wants to be in the presence of divinity? For me, it is grace, dignity, benevolence, compassion, and peace. All this I have found in wilderness. I have, therefore, rejoiced at my discovery of divinity in wilderness.

Wilderness is like a classical musical instrument—its structure grand yet delicate, its expression deep, beautiful, profound, and compassionate. But humans have forgotten the music in this instrument and have tried to use the strings to gin cotton!

We can indulge in the luxury of describing a grand and beautiful sunset as only colorful clouds. We can indulge in the luxury of thinking that a piece of pure emerald is just a piece of stone. We can call an exquisite piece of silk just the shell of a worm, or a pearl nestling within an oyster shell just a piece of hardened calcium. Yes, we can indeed indulge in the luxury of self-inflicted ignorance about wilderness, and, as we seem to be doing now, suffer the consequences of this self-inflicted wound.

What is this wound? Is it only a wound inflicted upon our bodies? If so, then we alone suffer the consequences of it. But it is not such a wound. The wound we are inflicting on wilderness is also inflicted on the whole planet and on all life on it. And, it is a wound inflicted on life yet to be born!

I recently visited an area that had been devastated by war between two human ideologies. The draconian technology used by the two warring factions was formidable. They seemed to be totally oblivious of the fact their weapons of destruction were aimed at Earth and the fragile wilderness upon it. They did not care. They did not realize the suicidal effect of their aggression.

As a result, wilderness was gored, mauled, maimed, mangled, and mutilated. Amidst this, it lay silent, defenseless, unable to protest. Feathered birds lay crippled in oil. Billions of marine animals suffocated. The wonder world of wilderness under the sea was devastated. The wonder world of sunbathed, energy-laden, water-bearing, cloud-filled skies was extinguished by black clouds spewing from red fireballs of human destructive anger.

We have indeed desecrated wilderness and have lost our right to expect from wilderness what it can give us so plentifully—sustenance, peace, beauty, prosperity, and, last but not least, dignity during our lifetime on this planet.

In many areas of the world, wilderness has become like a patient in crisis who has been admitted to the intensive-care unit of a hospital. In other areas, wilderness has already become extinct, leaving only the tomb-like silence of devastation.

With each admission of wilderness into intensive care, humankind's lifeline on Earth is damaged. As Amazon forests are cut and burned, humankind's lifeline is rendered in peril. The Gulf War, Chernobyl, acid rain, Antarctic snow melt, and the piercing of the ozone layer all represent this lifeline in peril.

We have been aware for centuries of Mother Earth and her wilderness. We have always known that our planet is not just a ball of earth and stone, lava and water, but a spiritual presence. The concept of wilderness and the spiritual design contained in this wilderness has also been a part of our ancient tradition, both in the East and the West. For example, the *Atharva Veda*, one of the world's most ancient scriptures, as quoted in the *Bhoomi Suktam* ("Hymn of the Earth") and translated in English, describes this concept well:

Truth, eternal order that is great and stern,
Consecration, Austerity, Prayer and Ritual—
these uphold the Earth.
May she, Queen of what has been and will be,
make a wide world for us.

Earth which has many heights, and slopes and the unconfined
plain that bind men together,
Earth that bears plants of various healing powers,
may she spread wide for us and thrive.

Earth, in which lies the sea, the river and other waters,
in which food and corn fields have come to be,
in which lives all that breathes and that moves,
may she confer on us the finest of her yield.

Earth, which at first was in the water of the ocean,
and which sages sought with wondrous powers,
Earth whose heart was in eternal heaven,
wrapped in Truth, immortal,
may she give us lustre and strength
in a most exalted state.

Earth, in which the waters, common to all,
moving on all sides, flow unfailingly, day and night,
may she pour on us milk in many streams,
and endow us with lustre.

Pleasant by thy hills, O earth,
 the snow-clad mountains and thy woods!
 O earth-brown, black, red and multi-colored—
 the firm Earth protected by India,
 on this Earth may I stand—unvanquished, unhurt, unslain.

I call to Earth, the purifier,
 the patient Earth, growing strong through spiritual might.
 May we recline on thee, O Earth that bears power and plenty,
 and enjoy our share of food and molten butter.

May those that are thy eastern regions, O Earth,
 and the northern and the southern and the western,
 be pleasant for me to tread upon.
 May I not stumble while I live in the world.

Whatever I dig from thee, Earth,
 may that have quick growth again.
 O purifier, may we not injure thy vitals or thy heart.

May Earth with people who speak various tongues,
 and those who have various religious rites
 according to their places of abode,
 pour for me treasure in a thousand streams
 like a constant cow that never fails.

May those born of thee, O Earth,
 be, for our welfare, free from sickness and waste.
 Wakeful through a long life, we shall become
 bearers of tribute to thee.

Earth, my mother, set me securely with bliss
 in full accord with heaven.
 O wise one,
 uphold me in grace and splendor.

This Earth, our mother, nurtured consciousness from the slime of the primeval ocean billions of years ago and sustained the human race for countless centuries. Traditional palmists speak of three important lines on one's palm: the lifeline, the headline, and the heartline. The lifeline is considered the vital line that establishes longevity, and lines that cross it represent the

obstacles and afflictions that can affect it. The headline and the heartline reflect intelligence and emotional character, respectively. They also touch, cross, and affect the lifeline in various ways.

For me, wilderness is the lifeline on Earth's palm, and it is being affected by the adverse headline of lack of intelligence and the heartlessness of humankind. But, as the best of the palmists will assure us, life need not surrender to futurology. Destiny need not be given away. Life on the Earth and life *of* the Earth can and must orchestrate its own destiny by ensuring that the lifeline of this planet, which is manifested in our recognition of wilderness, is steered by sensible use of the head and the heart.

The lifeline on Earth that has produced nourishment, tranquillity, compassion, and enlightenment has been the wilderness on our planet. Understanding this, and the vital force that wilderness embodies, at first appears complex and remote. But if the human race takes advantage of the extraordinary facilities of thinking and analysis that we are blessed with, wilderness, suddenly, like the sunrise, becomes clearly visible as the fountainhead of a productive and rewarding life on Earth.

It is up to us to walk away from the wasteland of our own ignorance and apathy, and recognize that our lives are linked with wilderness. We need to protect, preserve, and nourish wilderness as an act of survival on this beautiful, bountiful Earth.



THE USE OF WILDERNESS FOR PERSONAL GROWTH AND INSPIRATION

John Hendee and Randall Pitstick

Personal growth, therapy, and inspiration derived from wilderness have long supported the need for wilderness protection, and today, belief in the restorative power of wilderness experiences is widespread. We believe that the values of wilderness for personal growth and human inspiration are now more important than ever and will become even more important in the future.

Substantial evidence continues to accumulate in support of the use of wilderness for human restoration. As a result, we propose a process of how we think wilderness experiences lead to personal growth and inspiration. We believe that wilderness supporters, users, managers, and others interested in improving the human condition should more vigorously espouse and use wilderness as both a teacher and classroom for personal growth, therapy, and inspiration.

HISTORICAL ARGUMENTS FOR WILDERNESS IN THE UNITED STATES

The ideas behind the wilderness movement in the United States are replete with arguments of human restoration, personal growth, and inspiration. Henry David Thoreau wrote of nature as a source of spiritual renewal and inspiration. John Muir said: "Thousands of tired, nerve-shaken, over-civilized people are beginning to find out that going to the mountains is going home; ... and that mountain parks and reservations are useful not

only as fountains of timber and irrigating rivers, but as fountains of life.” Frederick Jackson Turner, in what is called the *frontier hypothesis*, argued that it was from independent pioneers on the frontier, struggling against adversity, that American democratic ideals and ideas emerged.

Aldo Leopold built on Turner’s theme that American individualism emerged from pioneer experience and argued for saving some of the environment that produced and could maintain such personal qualities. Bob Marshall promoted the physical, mental, and aesthetic benefits of wilderness and the opportunity it provides for complete self-sufficiency not available in urban settings. He espoused the chance to retreat from civilization and the terrible neural tension of modern existence to a place where independent thinkers could develop valuable ideas.

Thus, the value of wilderness for personal growth and inspiration has deep historical roots in the U.S. wilderness movement. As the movement grows, and with it the use, management, and size of the wilderness system, these restorative values are also expanded.

The increasing intensity of modern society, and its accelerating development and loss of natural environment everywhere, only accentuates the appeal to protect areas that have not yet been lost and still retain primal qualities. It is comforting to millions that, even if they never visit wilderness, places exist that have not been compromised by modern life—and metaphorically this nurtures the idea that a pilgrimage there could restore one’s perspective. Such values help account for growth of the U.S. National Wilderness Preservation System from 3,643,725 to 38,461,539 hectares over the past thirty years and make continued growth to between 52 million and 61 million hectares likely.

WILDERNESS FOR PERSONAL GROWTH—HARD AND SOFT SKILLS

The use of wilderness for personal growth and therapy has become so popular it was recently touted in a *New York Times* article as a major new movement in psychology called *ecopsychology* or *ecotherapy*. Many wilderness programs have personal growth and therapy explicit or implicit in their goals and have become major economic enterprises, with literally hundreds of programs now operating.

Soft versus Hard Skills

It is useful to think about hard skills versus soft skills because different wilderness programs may emphasize one or the other. Hard-skill activities include marathon hikes, rock climbing, ropes exercises, traversing snow-

fields, river crossings—activities that involve competition and vigorous exercise and risk (real or perceived). Soft-skill activities include community circles, group problem-solving, reflection, solo activities, and journal writing—activities that promote insight, evaluation, and reflection about one’s patterns of behavior, values, beliefs, and motivations.

Kinds of Wilderness Programs

The spectrum of wilderness programs serving personal growth, therapeutic, and inspirational needs includes: (1) catered trips to wilderness and wild rivers offered by outfitters and guides; (2) outdoor adventure training for executives and organizations; (3) adventure education programs aimed at the growth of individuals; and (4) wilderness therapy programs aimed at special populations seeking recovery and empowerment.

CATERED TRIPS BY OUTFITTERS AND GUIDES

National figures are not available, but in Idaho there are about 400 outfitters (owners/operators) and 1,600 guides (certified employees) that sponsor backpacking, mountain climbing, horseback, mountain bike, skiing, jet boat, raft, kayak, and canoe trips. The purpose of most outfitted and guided trips is not generally focused on personal growth, but promotional materials always feature a photo with a restorative theme. Many of the best outfitters now recognize the personal growth desires of their clients, and they often receive letters from former clients reporting life-changing experiences.

OUTDOOR ADVENTURE TRAINING

Outdoor adventure training is pursued by many corporations and organizations that use group and individual adventure experiences and the natural environment to develop executives and other employees or members. Literally tens of millions of dollars are spent annually for such training by U.S. companies. Some of this training takes place in wilderness. Outdoor development for managers is a strong tradition in England where a typical focus seems to be based on hard skills where the aim is to effect a confidence-building experience based on extending oneself “... [so] the course member begins to realize that many of the limitations he or she feels are artificial and self-imposed.” The idea is that one’s professional sense of competence can be expanded by success in structured outdoor activities.

ADVENTURE EDUCATION PROGRAMS

Organizations such as Outward Bound and the National Outdoor Leadership School run wilderness programs for targeted audiences such as youth,

executives, and occasionally special populations such as disadvantaged or delinquent youth. Hundreds of similar programs are run by individuals or small organizations. Data are not available to fully assess the number of such programs, how many take place in wilderness, or what impacts they have on people and resources, but substantial activity is involved.

WILDERNESS THERAPY PROGRAMS

Also emerging over the last two decades have been wilderness therapy programs featuring trips for special populations ranging from persons recovering from delinquency, personal tragedy, or substance abuse. Other participants are in transition and seeking personal strength and redirection for new lifestyles and careers or to overcome disadvantages imposed by circumstances such as poverty, mental illness, or physical and emotional handicaps. A variety of organizations offer wilderness therapy programs ranging from special trips sponsored by organizations such as Outward Bound to others that may specialize in serving the needs of court systems, hospitals, or special populations such as battered wives or victims of physical or sexual abuse.

SCIENTIFIC STUDIES OF WILDERNESS EXPERIENCE PROGRAMS

We have located more than 300 studies of participants in wilderness experience programs. The most significant pattern emerging from these studies is a consistent finding of increased self-esteem and sense of personal control for participants. One might question the validity of any individual pre-trip/post-trip questionnaire or interview study, but the collective consistency of findings from such a large number of studies clearly supports the notion that wilderness experience programs enhance self-esteem and sense of control.

Long-Term Studies

There have only been a few long-term studies of the effects of wilderness experiences. Rachel and Steven Kaplan, after studying participants in wilderness programs for ten years, strongly support the restorative theme. They found many individuals exhibiting positive changes and some with no change, but found no negative effects. Enhanced self-esteem, spiritual impact, and restored functioning were among their key findings.

Over twenty-two years, Robert Greenway, professor of psychology at Sonoma State University in California, took 1,400 college students on two- and three-week wilderness trips as part of his wilderness psychology academic program. His findings indicate significant long-term effects in the



Team leader assists in stream crossing in the Idaho wilderness. (Photo by Joy Hendee.)

lives of these students. Most students made lifestyle changes immediately upon returning from the two-week wilderness trips—such as changing roommates, partners, their college majors, or jobs—and otherwise reordered their lives consistent with insights gained on the trip. Students taking trips of three weeks or longer frequently experienced difficulties integrating back into the intense modern culture from which they came. Thus, one major idea emerging from Professor Greenway's studies is that if wilderness experience programs are too long, participants may experience adjustment problems when returning home to the fast-paced and compelling norms of modern culture.

A third study by Leslie Burton examined seventy-three graduate research studies of Outward Bound participants, including both normal and delinquent populations. Burton concluded that, in general, Outward Bound-type programs do have a positive impact upon self-concept, sense of personal control, self-assertion, and personality. More than half the studies of delinquent participants showed a reduction in repeat offenders.

HOW THE WILDERNESS WORKS FOR PERSONAL GROWTH

From all this evidence, we conclude that wilderness experiences provide personal growth, therapy, and inspiration. We also suggest how wilderness experiences can lead to personal growth, building on a prior model, with examination of hundreds of studies and our own research and experience. Just as forest management practices have been developed and refined, based on working hypotheses of how forests will respond to different actions under different conditions, we propose working hypotheses on the

probable effects of wilderness experiences on people, when certain conditions are met.

Personal Growth Defined

What is personal growth? We define *personal growth* as “a range of effects towards fulfillment of one’s capabilities and potential.” A continuum of personal growth outcomes are possible, ranging from heightened awareness of deficiency needs such as dependency, low self-esteem and autonomy, poor identity, and lack of direction at the low end of the spectrum; to insight and heightened awareness of values, abilities and desires, life purpose, and esteem in the middle; and to transformation or redirection of one’s life at the high end. The motivations for personal growth include a variety of reasons; for some it may be more power, possessions, or organizational effectiveness; for others it may be enhanced love and relatedness to humanity; and still others may seek resolution of personal issues or circumstances.

Five Conditions for Personal Growth

The following five conditions seem essential for personal growth from wilderness experiences:

1. *Receptive Participants—Ready to Grow*—Personal growth from a wilderness experience depends on the participants’ receptivity. Do they want to go? What are their expectations? Are they ready to change? Persons struggling with deficiency needs, those who are in transition from one life stage to another, or persons coping with emotional trauma are good candidates for personal growth.
2. *Optimum Stress in the Wilderness Experience*—Personal growth depends on the right degree of stress from the wilderness experience—physically and psychologically. This threshold will vary with the physical condition, current emotional state, and previous experiences of each individual. The goal is to achieve enough stress to allow successful coping yet simultaneously encourage participants to reveal core patterns so they can be considered, evaluated, and affirmed or shaped in positive ways. Too much stress can lead to breakdown.
3. *Cultural Change—A Break from Prevailing Norms*—Wilderness experiences provide a reprieve from cultural influences, especially prevailing cultural norms that govern so much of our behavior and ways of relating. For many, the slowing

down from life's hectic pace and the focus on mere essentials may be liberating. With this liberation from daily patterns, new perspectives may emerge and participants may open to new awareness.

4. *Opportunity for Attuning with Nature and Oneself*—With cultural influences diminished, participants can experience the natural environment and themselves in perspective. This is one reason soft skills are so important, so that participants can see the true significance of their lives in relation to the natural order—an experience that is at once humbling, renewing, and empowering. With such attuning with nature, core values may emerge to redirect one's life.
5. *Experiencing Wilderness Metaphors*—Wilderness experiences and activities can provide metaphors that heighten awareness of desirable qualities for application back home in daily life. Metaphors provide new ways of seeing reality and the opportunity to reframe old ways of seeing and doing things. Here, optimum stress can be important—to provide challenge but also allow for successful coping. The most simple metaphor may come from success in dealing with the stress of the wilderness environment, which can enhance self-esteem and self-confidence.

These five conditions enhance the probability that personal growth will occur in a wilderness experience by participants who (1) are ready for change, (2) are experiencing optimum stress, (3) are provided cultural change with a break from prevailing norms, (4) have opportunity for attuning with nature and themselves, and (5) experience wilderness metaphors. The fact that not everyone achieves personal growth from wilderness programs may be due to the fact that these conditions have not been met.

The Wilderness–Personal Growth Process

When these conditions are met, we hypothesize that the wilderness–personal growth process takes place in the following four sequential and interrelated steps:

1. *Increased Personal Awareness*—Wilderness experiences can reveal core patterns of personal behavior, values, emotions, fears, drives, and tendencies, thus fostering heightened self-awareness, the first step towards personal growth. The novelty of the wilderness experience strips participants of the

normal social basis for personal identity and provides many opportunities for acute personal awareness. In the absence of masks, participants must confront themselves. Core patterns emerge under stresses of coping and change. Programmed activities that facilitate self-discovery may be employed. Defense mechanisms emerge and can be gradually released as trust builds with companions. Participants can develop insight and glean new perspectives about who they really are and who they might become. Why in wilderness? Because it is so far removed from the cultural influences in our daily lives.

2. *Achieving a Growing Edge of Insight and Evaluation*—Wilderness and outdoor experiences, by heightening personal awareness of core patterns, beliefs, and values, place participants at a “growing edge” where these personal qualities can be evaluated and change initiated if desired. Simply stated, the “growing-edge” hypothesis asserts that as personal awareness is heightened under the stress of coping with and experiencing the wilderness, core patterns may become clear and may be available for evaluation and potential change.

Outdoor environments provide unique space for nurturing the growth of the human spirit. People can find a certain peace and calm from the quieting effect of wilderness—the much-needed change of pace and opportunity for attuning with nature. Values have a way of becoming more clear in solitude and silence.

3. *Increased Social Awareness*—Wilderness experiences in groups may reveal ineffective patterns of social interaction which can then be evaluated, shaped, and improved if so desired. In the out-of-doors, people begin to socialize in remarkably different ways. Status differences dissolve; stories are told; secrets are revealed; pains are shared; new alliances and friendships are formed; and existing friendships or family bonds are strengthened. Candid interactions and sharing occur, encouraged by the trust developed through the cooperation required on a wilderness trip.

The wilderness is socially ambiguous in that we are more or less equals and must interact at basic human levels. There are many opportunities to see oneself and others as never before. As participants move towards heightened

self-awareness and their growing edge, new and more effective patterns of social interaction can be learned, cultivated, and tested.

4. *Experiencing Primal Influences*—Wilderness experiences directly expose participants to the primal influences of nature and the elements, which foster a sense of humility in relation to the natural world. The exposure to primal influences distinguishes the wilderness as an extraordinary place for personal growth compared to other locations such as a playground, counseling center, classroom, or retreat facility. In wilderness, we must pay close attention, adapt, and respond to changing circumstances. Awareness must return to the essentials, to the primal truths of existence. One feels relatively insignificant in the face of nature's awesome power.

Such primal influences permeate the wilderness experience, a constant reminder of humankind's humble place in nature's order. An awareness is experienced that is fully present in the moment. One takes his or her place beside the creatures of the wild. This is the real meaning of inspiration and renewal: To be reborn with renewed perspective about one's place in the natural order.

Thus, we propose a process of personal growth from wilderness experiences for participants who are ready and receptive to experience optimum stress and cultural change, and thus have the chance for attuning themselves with the natural environment and experiencing wilderness metaphors. Such individuals, while in wilderness, may:

- increase their personal awareness;
- achieve a growing edge of personal evaluation;
- increase their social awareness; and
- experience primal influences of nature that can result in a sense of humility in relation to the natural world and enhance the entire personal growth process.

We believe there is compelling support for the notion that wilderness experiences can provide personal growth and inspiration for people. We believe it's time to more boldly espouse the value of wilderness for personal growth and human inspiration, just as we espouse the value of wilderness for protecting biodiversity and natural processes.



THE WILDERNESS AS A RESOURCE FOR HEALING

Mamphela Ramphela

Space has reduced me to silence.

—G. Bachelard

The wilderness has, from time immemorial, been associated with the search for meaning, the need for restoration of interior balance, and recognized as a place where one is likely to encounter one's creator or experience a special connection with the source of one's being. The wilderness is used for rights-of-passage rituals such as American Indian vision quests and (South African) Xhosa male initiations. Religious communities also retreat to the wilderness.

But what value would young people derive from a wilderness experience they did not seek or imagine could be accessible to them? The adolescent research project that we have been conducting since 1990 is an attempt to explore this question.

The children we work with are from New Crossroads, an African township in Cape Town created as a result of the bitter struggle against the antiurbanization strategies of the national government, which formed the core of the apartheid policy. New Crossroads has 1,738 residential sites and forty-eight designated public spaces for churches, crèches, schools, and businesses. There are three primary schools, one high school, one crèche, and three churches serving an estimated population of 10,340 (based on 1991 figures). There are no formal business centers, but many informal businesses.

Of the total population, children under sixteen years of age comprise 36 percent, while those ten to fourteen years old (the focus of our research) constitute 13 percent. Of the total households, 32 percent are female-headed, 67 percent male-headed, and 1 percent have children living on their own with no resident head. Average weekly income per household is U.S.\$83, with variable dependency ratios (derived from the number of people in a household) ranging from 1:2.4 to 1:5.0. Of the children ages ten to fourteen, 92 percent are in school.

New Crossroads is characterized by overcrowding, lack of proper services such as refuse removal, high noise levels, and many other poverty indicators. The constraints of space have profound implications for social relations. Conflicts over space are part of the reality of life, as are conflicts over many other scarcities. Taxi wars (i.e., violent battles between minibuss transport companies for control of various routes) are also part of the social landscape. In such a social climate, "survival of the fittest" assumes particular significance.

Children, the least powerful members of society, normally lose out in the allocation of scarce resources such as physical space. In a study on migrant labor hostels, in a book entitled *A Bed Called Home*, I explored the interrelationships among limited physical, political, economic, intellectual, and psychological space and their impact on social relationships. When people are forced to shrink to fit limited space, society is impoverished.

Relationships between children and adults are complex in New Crossroads. Shared love and care are often marred by what our informants regard as cruelty: "Adults are cruel. They just beat, beat, beat. You get beaten at home, at school, and in the streets," said a fourteen-year-old. Children are also affected by the violence in the wider society, both political (with its roots in the institutional violence of the deliberate impoverishment of black people through colonial conquest and racism) and criminal. The impact of violence has a dramatic impact on adolescent development. Suffice it to say that the adolescents we took into the wilderness were bruised to varying degrees by their social environment.

THE RESEARCH PROCESS

Forty-eight adolescents between ten and fourteen years of age were randomly selected from our 1991 demographic data base. They were divided into groups of eight, each group being taken out into wilderness areas in the Cape Peninsula over a long weekend, at least three times in two years. At least three adults accompanied the adolescents on each occasion. The

Wilderness Leadership School arranged all the trips, provided proper hiking outfits and provisions for the adolescents through sponsorship, and provided logistical support. The trails (treks) were graded to start with the least challenging environmental exposure. As the adolescents became more confident, more rugged exploration was introduced.

At the end of 1992, the sample of adolescents was further reduced to a group of sixteen children chosen for their leadership or creative qualities, particularly difficult circumstances such as violent family relations, and at-risk circumstances such as those on the verge of dropping out of school or joining gangs. We also tried to create a gender balance in our sample, ending up with eight boys and eight girls. This group of young people constitutes a longitudinal study sample that will be followed into adulthood.

Multiple research methods are used, and participant observation is enhanced because of the social-leveling effect of the wilderness. Individual interviews are also held to explore various issues, and each adolescent makes entries into a notebook during the weekends to record his or her impressions, important insights, and feedback on each trail. In addition, photographs are used to document important moments. The trails are complemented as a research milieu by home and school visits and workshops where further participant observation and discussion occurs.

OBSERVATIONS

Silence

“There is nothing like silence to suggest a sense of space,” French philosopher G. Bachelard observed in his book *The Poetics of Space*. The ability to tolerate silence could be viewed as the single most important measurement of behavioral change in the group of adolescents with whom we have been working. The level of noise during the first few trails was exceedingly high. The three areas of social interaction in which noise manifested itself were:

1. *Peer Conversations*—Peer conversations are high-pitched affairs. The logic seems to be that the louder one shouts, the more likely one is to succeed in conveying one’s case. A particularly striking example was an argument about whether or not snakes had legs. It was only after one youth asked the adults about the truth of this matter that the shouting match stopped. There are many other examples where arguments were manifested through vocal and/or physical threats. The provision of factual information seemed to lower tension levels.

2. *Bedside Chatter*—Bedside chatter during the first few trails nearly drove us insane. This was particularly marked among the ten- to twelve-year-old age group. The excitement of an outing, the high blood-sugar level after a hearty meal at supper time, and the novelty of sleeping in a group contributed to the problem. It was only when we mixed the age groups that the problem abated.
3. *Trail Talk*—During the first few trails, it was almost impossible to get the adolescents to walk in silence for any length of time. This is not surprising, given the noise levels tolerated by these children in the township environment. Over time, most of them began to appreciate being silent and listening to the sounds of nature.

The impact of long-term exposure to high noise levels seems to be a contributory factor to high tension levels. It is a well-established fact that people exposed to high noise levels risk permanent damage to their hearing organs. It is thus quite possible that sensitivity to noise diminishes over time if one is living in a high noise-level environment. I have noticed in my own speech how much lower my tone has become with exposure to lower noise levels.

We have observed other aspects of growth in the adolescents over the three years we have been working with them. Some of the changes are due to the natural development into greater maturity, but we believe other changes are indicators of our work's impact on the children.

Peer Relations

The level of peer conflict was extremely high in the initial stages. Most of the children knew one another from their home neighborhoods and/or schools. Peer harassment included humiliating one another's physical attributes, family circumstances, and many other hurtful exchanges. The teasing level was extremely high. Laughter was also used as a powerful weapon against one's peers. It is noteworthy that when I asked them under what circumstances they would beat their own children, all of them replied that if the child were to ever make them an object of scorn and laughter they would beat them.

There has been a significant change in peer relations towards more caring and considerate interactions. This is in part due to growing friendships, but it is also noticeable among those who are not particularly intimate. The tendency to replicate unequal gender relations has also considerably declined. In the initial stages, we had to repeatedly challenge the boys to

share chores with the girls and discourage the girls from seeing themselves as the natural gender to do the washing or cleaning. It is gratifying to see them naturally sharing these chores now. This was aptly captured by one of the girls:

We were also told when we were working that there is neither a girl nor a boy. There is nothing like “A girl is supposed to wash dishes.” Even a boy is supposed to do ... gardening work—girls are supposed to do gardening. We were taught about cleanliness, at home and in the streets, saying “This is not my home.” When parents are sleeping, we should not make noise when we are awake because they did not make noise when we were sleeping. On all the trails, I liked the way we were taught manners.

Adult-Adolescent Relations

Relationships between adults and adolescents are complex in South Africa and are defined by the problems of race, class, and gender differentials. Age differences, although important, take a back seat whenever blacks and whites interact. On one of the first trails, a child from a particularly violent family environment wrote on a blackboard in the hut we used: “Down with the white man!” Andrew Muir, the only white man on the trail, was not amused. The same child, three years later, feels nothing but tenderness for Andrew.

It was also this child, whom we will call Bonga, who could not make eye contact with adults in 1991. His contact with adults up to then had been marked by pain: repeated beatings by his father, his teachers, and older boys in the streets. He physically shuddered on one occasion when I put my arm around him to comfort him from the pain of being laughed at by his peers for crying from hunger. It was 6:00 P.M., and he hadn't eaten breakfast or lunch. The snack we had given all of them earlier had only made him hungrier—an understandable reaction for a twelve-year-old. It is gratifying to see him glow now when someone embraces him.

It is also noteworthy that these adolescents call me by my first name. This is most unusual for African children who are brought up to treat adults with reverence. So strong is the custom that even I still have difficulty breaking free from it and using the first names of people older than me. It is thus a measure of the intimacy that has developed between the adolescents and adults that we are on first-name terms. At the end of one of the trails, one of the girls wrote in her notebook: “We very much enjoyed having our friends Mamphela and Andrew with us this weekend.”

The fact that Andrew does most of the cooking has also had an impact on gender and race relations. They also are released from the chores that adults often load on them as a consequence of poverty. The trails offer them the opportunity to be children again.

Adolescent-Environment Relations

The impact of the youths' crowded, harsh, and neglected home environments was evident among the adolescents in the following areas:

1. *Littering*—Littering was a major problem. However much Andrew explained the importance of leaving the environment in the state we found it in, candy wrappers would be casually dropped along the way and fruit peels left with gay abandon after meals or sometimes thrown into pools. It took repeated reminders over almost a year to effect a change in behavior. The adolescents assure me now that they try and propagate the message of not littering in the township amongst their peers, but their success will depend on fundamental change in levels of service provided by local authorities.
2. *Attitudes towards Other Creatures*—Attitudes towards other creatures are conditioned by one's level of security within the universe. It is difficult for someone who is not treated with respect to respect others, let alone wild creatures. Bonga's instinctual reaction whenever he saw a wild creature was to kill it. "If I had a gun, I would go 'pooph! pooph!'" he said in response to the sound of baboons on a nearby hill. He also found it tempting to throw stones at birds or any other creature coming his way. His hunting instincts were nurtured by his rural upbringing in the Eastern Cape where he lived with his paternal grandmother for part of his early life.

It was noticeable, however, how the adolescents became increasingly curious about life around them in wilderness areas. Andrew taught them about the Western Cape *fynbos* (indigenous plants) with their rich variety of species, the animal species we came across, and the relationship among plants, animals, and humans. These were informal lessons that seemed to leave their mark on the young people, as evidenced by the high levels of detailed recollection long afterwards. One girl said:

I woke up early in the morning and heard some birds singing and frogs making their noises, and I enjoyed washing in the dam. I like being a member of the Wilderness Leadership School because here we are learning about the wildlife and ... we saw beautiful flowers such as proteas and ericas, and we sat on the mountain and saw the Indian Ocean.

3. *Fear of the Wild*—Those who revere wilderness do not usually focus upon their fear of the wild. My own childhood memories of fear of the dark and the unknown wilderness it holds within it were rekindled in 1991 while on a trail in the Umfolozi Game Reserve in Natal. I could thus empathize with the adolescents who balked at the idea of sleeping under the stars.

The presence of baboons normally associated with witchcraft in the adolescent's cosmology and symbolic framework added to the fear. They would tell stories of how so-and-so reported seeing a baboon being ridden by a witch in someone's backyard and would not be prepared to entertain the possibility of myth as a basis for the reported incidents. The joy and satisfaction that Jungian therapists and



*Two participants develop the confidence to enjoy the water on their own.
(Photo by Margot Morrison.)*

others derive from sitting alone at a campfire surrounded by darkness is matched by the terror that would strike those fearing the wilderness. One girl said:

When we were told we are going to sleep outside I thought I would not be able to sleep, but when I got into my sleeping bag I got warm like I am at home and fell asleep.

Our trails offer nowhere near the challenges associated with facing the night alone, but it is nevertheless interesting to watch how the adolescents huddle together in mutual support against the secrets of the darkness around them. There is always a scramble for the central sleeping slots. And yet, over time, fear has gradually given way to the quiet contemplation of the mystery of the night.

4. *Mastery and Self-Confidence*—Mastery and self-confidence are important elements in the normal development of young people and their understanding of their place in society and in the larger universal scheme of things. Ecological balance can thus be seen as a reflection of the balance within us as humans. The more balanced we are, the more likely we are to care about the world around us. Our adolescents increased their competence in English (some of them specifically mentioned this as a positive outcome of the trail experience), swimming, and knowledge of flora and fauna.

UNRESOLVED CONTRADICTIONS

Tough questions remain unanswered. On three occasions during our trail interactions, the young people indicated some difficulty in treating the wilderness as a place in which they may intermittently escape. “Why can’t you build us schools here so that we do not have to go back to the township with the noise and pain?” asked some of them after unsuccessfully attempting to prevent departure by running away into the wild. Another asked why we could not simply set up a permanent settlement and remain immersed in the surrounding beauty and peace. Yet another asked what sense there could be in having places like Groot Winterhoek, with its vast expanses of open veld left “underutilized” while so many squatters struggle for a piece of land on which to set up house. These are perhaps normal

childhood fantasies, but they raise uncomfortable questions about being able to afford the wilderness in a world where the majority of people are merely struggling to survive.

The response of a woman adult resident of New Crossroads also needs to be taken into consideration as we ponder the paradigm of the wilderness as a place of relaxation. "I grew up having to walk up and down mountains on the trails of cattle. There is no way I am going to spend my precious free weekend time doing the same thing as an adult," she said.

As E. P. O'Hea remarked in *Hermitage, a Metaphor for Life*, my experience in this research process has reminded me "how hard it is to contemplate when one is reduced to survival. Survival sets one's consciousness at a level of basic and immediate human needs and so occupies it with food, clothing, and shelter that it gives no attention to deeper levels of reality."

Our data suggests that the wilderness does offer a social-leveling space, which permits a healing process to occur in our fractured society. Social relationships at various levels seem to benefit: adult/child, black/white, child/child, and male/female. We hope that the longitudinal study we are conducting will throw more light on the bounds of these possibilities.

There are, however, cautionary notes in this apparently successful symphony. The majority of those who enjoy the wilderness experience worldwide do so out of choice. That choice is made possible by the process of modernity, which has made leisure affordable. It is thus ironic that those of us who have benefited from modernity need the continued existence of areas untouched and unspoiled by that same modernity to sustain our lifestyles with a measure of sanity. But there is a cost to having vast areas of the globe "frozen in time" for the primary purpose of satisfying our quest for the peace and healing we derive from them. The cost of not developing those areas can only be offset by equitable distribution of the fruits of modernity to the deprived majority.

Ecological balance has to extend beyond the campaigns that we participate in as environmental activists. Ecological balance has to be reflected in our daily human relations. There can be no sustainable environmental protection without sustainable development that places people at the center of the universe where they truly belong. The challenge for all of us who revere the wilderness is to consistently act with due reverence in relation to those created in the image of God, particularly the least of them, the children.



YOUTH AND WILDERNESS

Silje Gamstøbakk

Let us move back a hundred years in time. In 1894, British author Rudyard Kipling published *The Jungle Book*, a children's book in which he tells the story of a young boy, Mowgli, who is raised in the jungle by animals. Established as one of the world's foremost children's books, it is a story about a young person's discoveries about, and relationship with, the wilderness. Literally, it is about youth and wilderness.

If one traces the origin of the word *wilderness*, a good bet is the Old English word *wildeor*, literally meaning "wild beast." On a more semantic level, wilderness can be defined as "an uncultivated tract of land." A common definition of the word *youth* is "those who have not lived long" or "those who have not yet been cultivated."

As you can see, there is a link between the words. And it can be argued that this implies a relationship between youth and wilderness that is unique. Who better to understand an uncultivated area than an uncultivated youth?

YOUTH'S RELATION TO WILDERNESS

When discussing youth's relation to wilderness, I find it useful to look at three levels: (1) mythological, (2) sociological, and (3) political.

Mythological

In ancient Norwegian tradition, the runes were believed to express the

ideas of the gods, which then became eternal messages carved into nature. Humans could find the gods in the wilderness.

Years later, the same ideas could be found in the romantic era. “Back to nature” was the credo, perhaps most clearly expressed in the words of French philosopher Jean-Jacques Rousseau: “In nature untouched by humans, we find divinity—the eternal truth.” In his opinion, civilization—cultivation—destroyed nature. One could argue, as did Norwegian philosopher Peter Wessel Zapffe, that “humans are an element of nature that destroys its intention.”

Even though I don’t wholeheartedly agree with these considerations, I still find it plausible to use the mythological perspective. Perhaps the wilderness may be considered a book, from which humans can find eternal truths. This might be particularly applicable for youth, who are generally more open-minded and need more “truths” than older people.

Sociological

I think the wilderness plays a major role in forming our human identities and might be as essential to this formation as cultural heritage. If we lose the heritage of wilderness, we have, nature-wise, become a people without identity, and again, this most strongly affects young people.

The mythical aspect of this is obvious. The runic alphabet is, of course, a human construction. In nature, the runes inscribed their thoughts themselves, which helped them constitute their identity.

Both youth and wilderness are “uncultivated.” Through education, young persons are shaped, and through industrialization and cultivation, nature is shaped. Perhaps we should consider leaving some things uncultivated.

Political

On a political level, the issues to consider are: What will we leave behind for future generations, and what is reserved for today’s youth when they are adults? In Norway, there is virtually no pure wilderness left. Perhaps we should broaden the definition of *wilderness* to mean “nature handled with respect and care, with the original ecosystems left intact.”

Approximately one year ago, the beginning of a project to create a hazardous waste storage facility in Dovre—a national park that includes Norway’s National Mountain—was imminent. However, people organized against the project. Two thousand people, mostly youth, used civil disobedience to stop the project. Unexpectedly, due in large part to the protests, the Norwegian Minister of the Environment reconsidered the plan. This case illustrates the passionate reaction that wilderness can provoke.

Pragmatic

There is, of course, a wide range in worldwide youth relationships to wilderness. I still submit that my theories regarding youth relationships with wilderness are generally applicable worldwide. Other individuals involved in this area consider how industrial societies take steps away from nature through materialism and progress, often causing large sectors of the population to be unhappy.

An image of youth and wilderness often conveyed to us through advertising and popular culture is that of proud youth challenging the forces of Hollywood-style nature, seeking happiness through consumption, and caring only for themselves. Fortunately, youth priorities are often different from the images conveyed through commercials. Youths also care about their friends and the environment. This illustrates a basic attitude beyond consumption. Many people seek more substantial contact with individuals and the world around them.

It has been more or less established as a truth that youths are more radical than adults. Youths want something to happen, and they want it to happen now. Youths didn't build today's society, so they do not feel responsibility for maintaining it. French statesman Georges Clemenceau said: "Someone who has not been an anarchist as a sixteen-year-old is a fool," and he added, "but someone who still is an anarchist as a forty-year-old is an even bigger fool."

Perhaps youth's approach to this issue is double-sided: to protect the environment and conserve wilderness. This calls for radical political changes because today's society is mainly a threat to wilderness.

THE NORWEGIAN ENVIRONMENTAL MOVEMENT

The Norwegian environmental movement is a broad movement, with several different aspects. Most striking are the following groups: the animal rights movement, which mainly has an ethical approach; hunter's and fisher's associations and some sporting clubs, which have an aesthetic approach—the experience of nature; and the environmental movement, mainly the organization Nature and Youth, which generally has a political approach.

Ecological awareness is not only for youth. In some cultures, the people have never lost it, and in Norway it dates back at least one generation. There are adult environmental organizations. There are also several politicians and scientists regularly addressing environmental issues. But I submit that, in part, one environmental problem is that some "environmentalists" are more concerned with professional credentials and extreme accuracy (as well as



Although some people idealize youth participation in wilderness conservation, young people have an important role in environmental activism.

(Photos by Silje Gamstøbakk.)

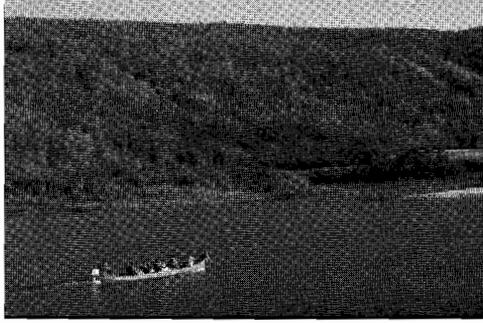
receiving credit) than they are with actually doing something about the problems. In one extreme, intellectualism is an obstacle to action. This is one place where educated, adult professionals might have something to learn from the young.

It is a question of using and caring for nature, of using the interaction between culture and wilderness, not misusing our power for management and alteration. Humans are a part of nature, and we have the unique ability to develop beyond our niche. We have a particular responsibility, and the future will bring great challenges to the coming generation and to those that follow. We can only hope that previous generations have succeeded in passing on values that will help us face these challenges.

Are We Descendants of Mowgli?

The moral in Kipling's book is that a particular human cannot be eliminated from society despite a lack of socialization. Mowgli must be unified with other humans in the end. Even if Kipling will turn over in his grave, I must present this interpretation: Mowgli shows another kind of socialization. The question becomes not one of the dualistic youth and wilderness, but of the organic youth in wilderness.

Recreation and Tourism



*Ecotourists experience Alta River (Norway)
hosted by local Sami. (Photo by V. G. Martin.)*

IS TOURISM A THREAT TO POLAR WILDERNESS? AN ANTARCTIC CASE STUDY

Paul Dingwall

In 1775, the noted British navigator/explorer Captain James Cook became the first traveler to venture south of the Antarctic Circle. He was unimpressed by the prospects for the region, declaring *Terra Incognita Australis* to be “not worth the discovering” and a place from which “the world will derive no benefit.” Cook could scarcely have contemplated the scientific importance now attached to Antarctica, and were he to visit there today, he would undoubtedly be astonished by the existence of a thriving tourism industry.

Indeed, tourists are now an integral part of life in Antarctica. Though the industry is immature and small-scale by world standards, tourism is now, apart from fishing, the major commercial enterprise in the region.

Rapid growth in the number of tourists and diversity of their activities has focused attention on their impacts on the Antarctic environment. Existing rules for tourism under the Antarctic Treaty, the remarkable international accord that governs all human endeavor in the region, have evolved in an ad hoc manner and remain incomplete. The 1991 Protocol on Environmental Protection, though applying to all human activities, remains untested and equivocal as a tourism management regime.

In examining the question of whether tourism poses a threat to Antarctic wilderness, this paper discusses the burgeoning Antarctic tourism industry and its regulation from an environmental conservation perspective. It suggests the basis of a tourism management regime for polar regions that would promote safe and responsible tourism practices that avoid conflict with other human activities, maximize the benefits to tourists and operators, and minimize harmful impacts on wildlife and the natural environment.

THE GROWTH AND DEVELOPMENT OF ANTARCTIC TOURISM

Antarctic tourism has a checkered history. From small and tentative beginnings some thirty-five years ago, commercial tourism is now the most rapidly developing human enterprise in the region. Over the past ten years, there has been a six-fold increase in the number of tourists visiting Antarctica each year. The annual influx of tourists, which reached a record level of 6,500 in the 1991–1992 austral summer, now outnumbers that of scientists and their support staff by a margin of almost two to one.

The rapid growth in Antarctic tourism exemplifies the global boom in nature-based and adventure tourism (so-called ecotourism) and their expansion into even the most remote and hostile regions of the world. People are attracted to Antarctica to experience its isolation, appreciate the scenic grandeur of its pristine wilderness, see the profusion of wildlife, relive something of its pioneering history, and meet the personal challenge of wilderness adventure.

In the broadest sense, tourist activities include commercial ship cruises, air voyages (both overflights and landings), privately conducted expeditions for climbing, skiing, and related pursuits, small yacht voyages, visits by government officials, diplomats, and other famous people, and the off-duty recreational activities of scientists and staff. The wide-ranging interests of Antarctic tourists make it difficult to stereotype them or their activities. For

environmental considerations, however, it is useful to distinguish between commercial and private activities because the former are normally larger in scale and involve more people. Thus, they have a greater potential for environmental disruption and demand greater management effort.

Commercial ship cruises are the main form of seaborne tourism in Antarctica. Each vessel carries from one hundred to two hundred passengers and operates during the summer period of November to February, with departures from southern ports particularly in South America but to a lesser extent in New Zealand, Australia, and South Africa. Typically, voyages are about two weeks in duration, with landings on four or five days using small inflatable craft. Some vessels have helicopters, allowing tourists to be carried to more remote sites. Activity is overwhelmingly concentrated in the Antarctic Peninsula region where proximity to South America cuts the time spent at sea, and the prevailing maritime climate reduces the amount of pack ice. The next most popular destination is the Ross Sea region south of New Zealand. Some itineraries involve long circum-Antarctic voyages, and many include visits to southern islands such as the Falkland Islands, South Georgia, and the New Zealand and Australian sub-Antarctic islands. Some vessels are ice-strengthened; during the 1991–1992 season, Russian icebreakers, carrying forty to fifty passengers, were used on tourist charters and visited areas where pack ice prevents access by larger vessels. Preferred tourist landing sites are penguin and seal rookeries, scientific research stations, and historic sites.

Shipborne tourism is self-contained, without land-based supporting facilities. Visits are expensive. Costs of cruises vary greatly depending upon the ship, its facilities, and the itinerary, but a typical two-week cruise may cost U.S.\$5,000–U.S.\$10,000, excluding the cost of airfares to departure ports. Cruise passengers are predominantly Europeans and North Americans, and to a lesser extent Asians, particularly Japanese, and tend to be more affluent and better educated, with women and elderly social groups well represented.

A small number of tourists (currently only about 5 percent of the annual total) travel by air, flying mainly from southern Chile to an airstrip in the South Shetland Islands, but also landing at the South Pole and at inland mountain sites for climbing and adventure expeditions. Overflights by large commercial jetliners were common in the Australian and New Zealand sectors of Antarctica from the mid-1970s and carried up to four thousand passengers annually, but they ceased operation following the tragic loss of a New Zealand aircraft on Mount Erebus in 1979.

Because of the many commercial and operational variables involved, the pattern of future tourism growth in Antarctica remains somewhat speculative. However, the potential for development is huge and significantly outweighs the scale of current operations. Possible developments include the

grandiose proposal of an Australian entrepreneur called Project Oasis, which envisages construction of an airport on the continent capable of handling wide-bodied jets, bringing some 16,000 tourists each summer, with on-site hotel accommodations for 350 visitors and 175 staff, and a helicopter shuttle service allowing visits to surrounding places of interest. This proposal has been dropped, but it demonstrates the possible magnitude of future operations and the scale of associated environmental impacts.

VISITOR IMPACTS

Tourism has the potential to be both beneficial and costly in its effects on the Antarctic wilderness and on other recognized activities. Among the benefits are promotion of environmental conservation deriving from the tourists' enhanced appreciation of conservation values and regional conservation needs. Research and environmental monitoring activities may also benefit where tour vessels provide logistical support and communications. Undesirable impacts include trampling damage to soils and vegetation, wildlife disturbance, littering, pollution, and disrupting scientific programs.

Experience to date demonstrates that tourist activities have been largely benign in their environmental impact, particularly compared to the often severe localized disturbance of scientific stations. Antarctic tourist operations are generally well organized, activities are closely supervised, and the great majority of tourists behave with care and respect for the environment and wildlife.

Some isolated incidents and accidents have marred this good record—notably the Mt. Erebus air crash, which involved a costly search-and-rescue operation that seriously disrupted scientific activities at the nearby American and New Zealand bases, and the wreck of the *Bahia Paraiso* in 1990, in which an oil spill damaged an area particularly rich in marine life and disrupted a long-term ecological research project.

Some recent trends in tourist activities give rise to further concerns. Most visits are concentrated in the short summer season, which also coincides with critical wildlife breeding cycles. Increased frequency of visits to favored breeding localities make disturbance more likely. During 1991 and 1992, for example, tour companies based in the United States sponsored 190 landings, which brought between two thousand and three thousand people to nine sites. There is also an increasing use of larger vessels capable of carrying up to four hundred passengers, and the introduction of icebreakers possibly opens many formerly unvisited sites to tourist use. Careful management procedures backed

by legal regulation are required to deal with these new situations and the possible increased threats arising from increased tourist pressure.

TOURISM REGULATIONS

The recommendations of Antarctic Treaty consultative meetings currently provide tourism regulatory measures backed by national legislation. Developed over time in a somewhat uncoordinated fashion, they address matters such as the avoidance of disruption to scientific research and requirements for self-sufficiency, proper leadership, and adequate insurance coverage for tourism operations. The treaty parties have also given consideration to the problems associated with excessive visitor numbers at stations, the need for improved monitoring, reporting, and information exchange, and the need for an agreement on who has responsibility for nongovernmental expeditions.

The Protocol on Environmental Protection to the Antarctic Treaty, adopted by the treaty nations in 1991, includes far-reaching provisions of direct relevance to tourism. These include the application of environmental-impact assessment procedures, prevention of marine pollution, management of waste disposal, protection of flora and fauna, and the establishment of areas for special protection and management. The treaty parties have still not reached agreement about the adequacy of the protocol to regulate tourism, and there is a need for further elaboration of implementation procedures applying to tourism. Some of the remaining questions relate to:

- the absence of rules regarding liability for environmental damage and response action;
- guidance on what constitutes activities liable to penalties for threatening environmental values;
- lack of rules ensuring the required cooperation among the parties in planning and conducting activities;
- insufficient clarity about who is responsible for preparing the environmental evaluations required in the official prior notification of expeditions;
- procedures for tourist vessel inspections and observations while at sea;
- specification of what constitutes wildlife disturbance and to whom penalties for offenses apply; and
- further guidance on acceptable tourist levels, especially at areas designated for special protection and management.

These are among the matters that treaty governments are currently considering in preparing their national legislation required for ratification of the protocol.

A CONSERVATION BASIS FOR TOURISM MANAGEMENT

Management of Antarctic tourism has recently come under scrutiny from conservationists. The World Conservation Union (IUCN), the world's principal conservation agency with more than six hundred government and nongovernment members active in 120 countries, has developed tourism policies based on its *Strategy for Antarctic Conservation*, published in 1991. The IUCN regards tourism as a legitimate activity in the Antarctic, but stresses the need for caution and the imposition of constraints on tourism development.

Recommendations in the strategy, subsequently developed further in consultation with the treaty parties, call for a comprehensive review of existing tourism management and development of measures and practices that, above all, encourage responsible operations that ensure visitor safety, avoid conflicts between tourism and other approved activities (especially scientific research), provide maximum benefit for tour operators and enjoyment for visitors, and minimize any harmful impacts on the wildlife and wilderness landscapes.

The following is an outline of key requirements that the IUCN considers necessary to provide a conservation-based management regime for Antarctic tourism and to counter actual and potential threats to the Antarctic environment. These suggestions are consistent with the initiatives to date of the treaty parties and tourist operators, and they are supported by the best available research and assessment of tourist experience, particularly that of the Scott Polar Research Institute in Cambridge, United Kingdom.

1. *Review and Consolidation of Existing Legal Measures*—For promoting compliance, it is essential that tourism regulations be consistent, well integrated, and clearly presented. The treaty parties have recognized the importance of this, and the Madrid Protocol provides much of the necessary regulatory and institutional framework. More is needed, and further consideration should be given to providing a legal instrument dedicated to tourism. This might be another annex to the protocol or an environmental code of practice for tourism that could be appended to the protocol. It should

be accompanied by a review of existing measures and a filling in of gaps so that legally binding obligations are clear for all who manage, plan, conduct, and participate in tourist ventures.

2. *Development of Practical Management Guidelines and Operational Codes*—Many national authorities already implement procedures for encouraging environmentally sensitive tourist operations, and the Council of Managers of National Antarctic Programs (COMNAP) is developing and standardizing these. The guidelines should cover, among other things:
 - detailed procedures for issuing permits to authorize expeditions and supervision of permits by accredited officials from the administering authorities;
 - limitations on places visited and on numbers of visitors at sites, daily and seasonally (treaty regulations allow for designation of areas of special tourist interest, but little use has been made of them even though they are a valuable device for directing activity away from research, environmentally sensitive, or protected sites, and to areas of tourist interest that can absorb some degree of visitor pressure);
 - restrictions on activities ashore, covering prohibition on smoking, fires, littering, souvenir collecting, specimen or artifact collecting, wildlife, soils, and vegetation disturbance, and overnight stays;
 - application of quarantine measures to guard against introductions of exotic plants (including seeds), animal pests, and diseases; and
 - requirements for adequate supervision by qualified guides—a ratio of one guide to ten passengers is common practice.

3. *Consistent Self-Regulation of the Tourism Industry*—In 1991, Antarctic tour operators established an International Association of Antarctic Tour Operators (IAATO). Currently comprising thirteen charter members, IAATO has already developed an agreed Travelers' Code of Conduct. This is a constructive self-regulation initiative, which encourages cooperation with authorities and engenders in tour operators a

strong sense of regulations ownership, which in turn promotes responsible action and compliance.

4. *Improved Procedures for Reporting and Exchanging Information on Tourist Activity*—Current reporting from tour operators varies greatly in quality and consistency. Standardized reporting forms and approved means of freely exchanging reliable information among all parties concerned are currently needed.
5. *An Antarctic Tourism Observer Scheme*—The information referred to above should form a component part of an official tourism observer scheme, administered by the treaty parties. This should cover vessel inspections, permit supervision, including permit offense reports, tour operator infractions, and environmental impact evaluations.
6. *Improved Communication between the Treaty Parties and Tour Companies*—Dialogue between treaty governments and tourist operators, aimed at promoting uniform management practices and improving information sharing, would be enhanced by regular meetings between the two groups. This could be arranged on an annual basis, possibly hosted by COMNAP, to report on the previous year's activities and plan those for the forthcoming year.
7. *More Research on Tourists and Their Environmental Impacts*—Information is scarce on Antarctic tourists—their aspirations, expectations, satisfaction levels, and environmental impacts. Scientists from the United Kingdom, Chile, and Argentina have begun collaboration on a successful, long-term monitoring program of tourist visits to selected sites in the Antarctic Peninsula. New Zealand and Australian authorities have also begun tourist research and monitoring programs on their respective sub-Antarctic islands, and this work has already been useful for improving management of visitor impacts at these vulnerable island nature reserves. More research is needed to obtain accurate information on the demographic profiles of tourists and their attitudes towards wilderness conservation, behavior towards wildlife, and impacts on the environment and other activities. Such research should be sponsored by treaty governments, supported by tour companies and non-governmental organizations (NGOs) and advised by SCAR.
8. *Improved Education and Training of Tour Operators and Visitors*—Tourist activities in Antarctica take place in a re-

mote, harsh, and hazardous region, where accurate navigational charts and weather forecasts are often lacking and few emergency facilities exist. The treaty parties, in conjunction with IAATO, should develop personnel training and certification schemes for ship personnel, boat operators, tour leaders, and guides. On-board briefings and lectures are currently widely employed for education and environmental awareness of tourists. Such programs should be made mandatory. They would be facilitated by tourist guides, in at least the four official treaty languages, and cover legal requirements, codes of practice, and environmental information. These could build upon the currently available SCAR Handbook for Visitors to the Antarctic and a privately produced guidebook for private yacht expeditions.

9. *An Antarctic Tourism Management Plan*—Comprehensive planning of the future development of Antarctic tourism would benefit from preparation of an overall Antarctic tourism management plan. All interested parties—Antarctic governments, conservation NGOs, tour operators, scientists, and conservation professionals—should cooperate to develop this plan. Such a plan would establish the objectives and conservation principles for Antarctic tourism development and provide guidance on legal rules and regulations, policies, and approved management practices, all of which are fundamental to annually planning tourism operations. The plan should utilize the best available scientific information, be regularly revised, and be flexible enough to accommodate new information and respond to changing opportunities and needs. The plan would be invaluable for coordinating management and research efforts, and would play an important educational role.

Commercial tourism in the Antarctic to date reveals that, at current limited operational levels, tourist activities pose little threat to wilderness values. Tourist use of Antarctica and its resources can, therefore, be regarded as compatible with the objectives of wilderness conservation. In practice, the major disruptive impact from tourism is on the operation of scientific stations and research programs, particularly where accidents to ships and aircraft have required costly search-and-rescue operations or caused localized pollution.

Although the future development of Antarctic tourism is unpredictable, the industry is likely to continue to grow and diversify. Any significant

expansion of tourist activities would present far greater risk of damage and disruption, especially where there is pressure to build land-based tourist facilities such as hotels, wharves, and airstrips.

Revolutionary reform of legal measures for Antarctic conservation in recent years has provided a sound regulatory framework for tourism management. Much more work is needed, however, to devise and implement practical measures for controlling tourist visits and minimizing their environmental impact. Development of these measures is currently under active consideration by the Antarctic Treaty nations, who are benefiting from collaboration with the tourist operators, national Antarctic program managers, scientists, and professional conservationists.

Further progress in developing tourist policies, management measures, and the necessary associated research, monitoring, information exchange, and education and training would benefit from development of a comprehensive and widely consulted Antarctic tourism management plan. Such a plan holds the promise of serving the best interests of the Antarctic governments and the tourism industry in protecting Antarctic wilderness values.

The observations and recommendations presented here are aimed at the development of tourism in Antarctica. The various recommended conservation principles and practices are, however, capable of general application in achieving the objectives of sustainable and ecologically sensitive tourism development. They are especially commended to northern governments and the tourist industry for promoting conservation-based tourism development in the Arctic.



ECOTOURISM, WILDLAND VALUES, AND WILDERNESS PRESERVATION IN THE U.S. NATIONAL FORESTS

Elizabeth Estill

In the nearly thirty years since the Wilderness Act of 1964 was signed into law, the U.S. Congress has set aside a multimillion-hectare legacy of wilderness that continues to grow in size and value for the American people. Though debates continue over what lands should be set aside as wilderness, there is no question about the vital importance of wilderness or the equally compelling mandate to manage and protect it.

The roots of the wilderness ethic run deep in the United States. Colonial America was a true wilderness, blanketed with forests. Legend has it that squirrels traveled the tree tops from Maine halfway across the United States to the Mississippi River without ever touching the ground. Three hundred years ago, the land was primarily affected by the forces of nature, with the imprint of humans substantially unnoticeable. The wilderness was endless—a challenge to be conquered rather than a resource to be protected and cherished.

The needs of a growing nation changed this spectacular landscape. Forests gave way to farmlands and towns. Timber was used to build homes and fuel industry. Settlers pushed roads and railways across the landscape.

Then, by the end of the Civil War, writers and artists began to recognize the historic, spiritual, and scientific values of wilderness. Other concerned citizens recognized the changes overtaking and altering the landscape. In 1891, the U.S. Congress authorized the president to close some public lands to settlement. Even then, people realized resources for the future couldn't be guaranteed just by limiting settlement; the land also needed care. And so we

created the forest reserves. The reserves later became national forests and, in 1905, their care became the responsibility of the newly created U.S. Forest Service (USFS).

Early in its history, visionary USFS employees recommended that special areas within the national forests be set aside and preserved. In 1924, the agency further shaped the wilderness concept by establishing the Gila Wilderness (226,000 hectares) in New Mexico.

By 1925, the USFS adopted regulations establishing primitive areas. Later, additional regulations further defined and established wilderness areas (wild, roadless areas) within the national forests.

The first efforts at legislative, rather than administrative, wilderness protection grew out of the concern that administrative protection could be easily reversed. The first bill was introduced in 1956. After eight years, sixty-five different versions, eighteen hearings, and considerable compromises with grazing and mining interests, the Wilderness Act was finally passed and signed into law on 3 September 1964. The 3.7 million hectares of national forest land set aside became "instant wilderness." It took a strong commitment from a majority of the U.S. Congress to enact this historic piece of legislation.

The Wilderness Act is amazingly brief. It defines *wilderness* as "an area where the earth and community of life are untrammelled by man, where man himself is a visitor who does not remain." Except for existing private rights, the act allows for neither commercial enterprises nor permanent roads. It prohibits access for motor vehicles, motorized equipment, motorboats, aircraft, and other forms of mechanical transport. It also prohibits permanent structures and installations within wilderness.

The National Wilderness Preservation System (NWPS) forms a rich mosaic of diverse ecosystems. Today, at almost 39 million hectares, it is comparable in size to Finland and Denmark combined. It embraces mountains and valleys, wetlands, and deserts. It features alpine lakes, rivers, and seashores, and it includes wildlife habitat and extraordinary geologic formations. Most of this land is in Alaska. Only 15.6 million hectares, a little less than half the system, are located in the "lower 48" states. Of this, 11.8 million hectares are in national forests. We anticipate the national forest wilderness system will expand from its current size of about 18 percent of the national forest system to about 25 percent of the system before growth levels off. This is in contrast to lands available for timber production, which have decreased in size to only about 25–30 percent of the system.

The nation's largest wilderness, Wrangell-St. Elias National Park in Alaska, with 3.6 million hectares, is about 15 percent of the size of the United Kingdom. The smallest national park, Oregon Islands, comprises two hectares

off the coast of Oregon. Large or small, wherever a wilderness is located, there are a number of reasons for its protection.

We've heard a lot about ecotourism. Recreation is big business in the United States, and wilderness contributes to the industry. In turn, recreationists impact the quality of wilderness. We need to seek a dynamic balance between allowing wilderness use and protecting wilderness for the future.

In the five states I oversee as a Rocky Mountain regional forester, national forest recreation was a U.S.\$2-billion industry that supported 70,000 jobs in 1992. That is seven times the economic impact of our more well-known timber program in the same area, creating ten times more jobs than the timber industry.

Research shows that the nonmonetary benefits of wilderness are increasing at an even faster rate than the financial ones. As the number of pristine places in our country declines, their value increases.

Wildlands have natural and ecological values that are vital to the nation's—indeed, the planet's—well-being. Many have yet to be discovered or fully understood. Wilderness is an important component in global health. It protects watersheds upon which many cities and rural communities depend for pure water, serves as critical habitat for wildlife threatened by extinction, and improves air quality because of the filtering action of green plants and forests.

Today, as we learn more about the greenhouse effect and the depletion of the ozone layer, more and more people are coming to realize that humanity is part of an interconnected “web of life.” Wilderness maintains gene pools to provide diversity of plants and animals. Preservation of biological diversity is important because the survival of our own species ultimately depends on the survival of others.

Plant and animal species existing in their natural states have played major roles in the development of heart drugs, antibiotics, anticancer agents, and anticoagulants. More than 25 percent of all the prescriptions sold in America each year contain active ingredients from plants. Wilderness serves as a unique and irreplaceable “living laboratory” for medical and scientific research.

Wilderness areas are increasingly being recognized as “a miner's canary”—indicators of harmful environmental changes. For the most part, wildernesses are sensitive to disturbance and pollution. Because they are typically in relatively natural, undisturbed states and are widely distributed, they serve as barometers of environmental impact. As such, wilderness health indicates national, continental, and global environmental health. Within this context, both the need and the challenge will continue for better monitoring of whatever changes are occurring within wilderness boundaries.

Wilderness helps protect geological resource values. Undisturbed, naturally occurring geological phenomena can, therefore, persist so present and future generations can pursue the origin of this planet and the universe.

Artifacts and structures protected by the Archeological Resources Protection Act, among other laws, take on a new perspective when experienced within the context of wilderness. Cultural resources tell a valuable story about the human relationship with wilderness.

Wilderness serves as a haven from the pressure of fast-paced, industrialized society. It is a place where we can seek relief from the noise and speed of machines, the confines of steel and concrete, and the hordes of people.

Wilderness helps ensure that future generations will be able to visit a natural environment. Some people derive enjoyment and satisfaction simply from knowing that natural environments exist, even if they never visit them.

For all its uses, values, and scenic wonders, wilderness is a land heritage that is uniquely cherished in America. In the words of Pulitzer Prize-winning novelist Wallace Stegner: "Something will have gone out of us as a people if we ever let the remaining wilderness be destroyed."

The nonmonetary benefits of wilderness are vast and probably immeasurable. But let's go back to the financial benefits of tourism for a minute and think about the impact of all those visitors on wilderness and on its nonmonetary values. Where and how do responsible managers strike a balance?

The recreation estate in the United States reaches from coast to coast and from Mexico to Canada and up into Alaska. The NWPS is only a fraction of the area available for recreation and tourism opportunities through federal, state, local, and private lands. But the mix differs from place to place. For example:

- More than 112,000 kilometers of rivers have been designated for inclusion in the National Wild and Scenic Rivers System. States have designated 96,000 kilometers as significant rivers for recreation, historic, scenic, or wildlife values. Many are in or near wilderness.
- Over half the nation's downhill skiing and two-thirds of its cross-country skiing take place in the national forests, usually in (as in cross-country skiing) or near wilderness.
- The national forests encompass 192,000 kilometers of trails, providing hiking and horseback riding for thousands of people. Guess where?

As more and more people pursue recreational opportunities, demands for wilderness experiences and impacts on the recreation resource will grow.

And recreationists aren't the only ones impacting wilderness. Population growth and community development of the landscapes surrounding and in wilderness will increasingly affect these wildland areas. People are attracted to natural areas and, with advanced telecommunications systems, they can now settle in or near them. The impacts of residential development, and the urbanization that follows, can take many forms—such as noise and air pollution. Those impacts don't respect property lines—they affect flora and fauna and recreational quality inside and outside wilderness.

How is the USFS dealing with this? We have both short-term and long-term strategies. In the short term, we have begun to focus ecotourism and other recreational activities on less sensitive ecosystems. Federal land managers are encouraging a shift in recreation use to wilderness-like areas that are not what we call *big W* wilderness or not legislatively mandated. We are lucky in the United States that, with the vast amount of land available, we have this option. Land managers are working together to increase the carrying capacity of nonwilderness areas and to move recreation use to areas where carefully managed ecosystems can support more use.

Nearly thirty years of experience in wilderness management has shown us we need to cultivate skilled wilderness managers and obtain scientific information that will help us balance the uses and values of the NWPS. Part of our long-term strategy is to improve our ability to see and predict trends in the uses and values of wilderness. The USFS, in cooperation with other federal land-management agencies, has founded training and research arms to work in concert to meet these goals.

The Arthur Carhart National Wilderness Training Center was dedicated in Montana in early 1993. The facility fosters excellence in wilderness stewardship by cultivating knowledgeable, skilled, and capable wilderness managers. But, wilderness managers alone cannot prevent the degradation of the wilderness resource. The public must also understand wilderness values and how to use wilderness with respect and restraint so it doesn't lose its unique character. The development of effective educational and interpretive techniques and material to teach the public low-impact use skills—to “leave no trace” and “tread lightly on the land”—is a continuing challenge.

The Aldo Leopold National Wilderness Research Institute, also founded in 1993, obtains and provides information necessary to sustain wilderness resources in an ecologically and socially sound manner for the present and future through research, technology transfer, education, cooperative studies, and partnerships.

With the development of the Carhart Training Center and Leopold Research Institute, land-management agencies took a dramatic step towards forging a new era in wilderness management. Although the USFS is taking

the lead in establishing these new forums, their charters are interagency in scope. While there are four federal wilderness management agencies, there is only one NWPS. These forums will focus on the entire system, not on just one agency's portion of it.

Looking beyond our nation's boundaries, these new fora are the precursors for new understanding and action on land use worldwide. They will serve as international models for wilderness stewardship. Over time, the Carhart Center will establish a cadre of wilderness rangers and managers who are world renowned for their professionalism, expertise, dedication, and integrity.

The Leopold Institute will attract a core group of distinguished scientists who will be world leaders in probing the frontiers of science and knowledge that are essential to wilderness lands and their natural systems. It will draw visiting international scientists and encourage America's universities to develop cooperative wilderness research and study initiatives. The institute will increase the world's understanding of natural ecosystems and help monitor the wilderness system's and biosphere's health through using wilderness as a natural benchmark.

The NWPS is unique in its purpose. It could serve as a component of a larger global system of wild areas for resource protection. Wilderness and wilderness management models in the United States have been established for the use of the American public, but they, too, have global implications. They are here for the world to view, study, and consider for the benefit of all wilderness resources for today and tomorrow.

The United States changed from an undeveloped wildland prior to colonization to a highly industrialized, urban-centered landscape without much planning or regard for the impacts on natural resources. Then, as we moved into the twentieth century, the nation awoke to the realization that some lands should be protected for their natural values. Now we realize that setting these lands aside was good but not enough. We must also protect and manage them for recreational, spiritual, and scientific values. How we do that, how we set priorities for research and management, is the challenge that everyone faces as we head into the twenty-first century. As Stegner said about wilderness:

The reminder and the reassurance that it is still there is good for our spiritual health even if we never once in ten years set foot in it. It is good for us when we are young because of the incomparable sanity it can bring briefly, as vacation and rest, into our insane lives. It is important to us when we are old simply because it is there. Important, that is, simply as an idea.



THE VALUE OF POLAR WILDERNESS IN A GLOBAL PERSPECTIVE

Bjørn Kaltenborn

Try to picture a public hearing in Alaska that took place some years ago. The topic of the meeting was impacts from different types of technological developments in Alaskan wilderness areas. Robert Weeden, a game biologist, went up to the podium to present what the audience expected to be more tables, charts, and hard facts. Weeden's words clearly show that development concerns went beyond traditional science and technology when he said:

The world needs an embodiment of the frontier mythology, the sense of horizons unexplored, the mystery of uninhabited miles. It needs a place where wolves stalk the strand lines in the dark because a land that can produce a wolf is a healthy, robust, and perfect land.

I do not think Robert Weeden adopted this philosophy as part of his university biology training. Nevertheless, it is to his credit that he had the guts to illustrate the complex issue of understanding the values of polar wilderness. Beyond the most general level, we have a limited understanding of these values, particularly of the social values. Weeden touches at the heart of the issue: Namely, what are the attributes of polar wilderness to humankind in a long-term perspective, and how do we perceive and value them? Furthermore, does polar wilderness carry different meanings and sets of values than other types of wilderness areas, and does polar wilderness have any global significance?

WHY UNDERSTAND POLAR WILDERNESS AREA VALUES?

The polar regions are among the least-inhabited, and, in some ways, the least-impacted regions worldwide. However, they are not environmentally, politically, legally, or economically robust lands. One can argue that the polar regions are internationally unique. For example, North American Inuit culture is distinctly different from the Sami culture of northern Europe. The variety of home-rule governments in Canada, Alaska, and Greenland are interesting global experiments. The Russian industrialization and modern settlement of the permafrost country lacks parallels.

Yet, I think there are good reasons for considering the Arctic, and to some extent the Antarctic, as a socioeconomically and politically integrated region. Perhaps we should be less concerned with the special character of polar regions and see them more as what Oran Young has called *socioeconomic and political testing grounds for generic issues*.

Resource and wilderness management worldwide depend more and more on adequate understanding of sociopolitical resource regimes. Polar regions offer outstanding opportunities to explore human-environment relationships as general topics of how different populations develop a mutual dependency between humans and nature. The dominant social paradigm of the Western world accepts environmental and social degradation in order to achieve economic growth and progress. Yet, we see increasing rebellion against this. Alternative values like quality of life, self-esteem, and different forms of personal fulfillment are growing in importance. Many are searching for meaning, content, and stronger relationships to natural environments. Polar regions still comprise relatively large, unchanged natural areas capable of fulfilling the experiential needs of generations tired of materialism. Unless the potential of polar regions to fulfill such needs is better documented, we currently stand a considerable risk of losing that potential. The vicarious values of polar regions are no doubt substantial, although we really don't know how substantial.

Wilderness management in polar regions requires a unique approach because of their large size, special environmental conditions, and the presence of indigenous peoples who live there. Much has gone wrong for the native peoples of the North. However, they have adapted to the environment over centuries and still carry knowledge about sustainable living that can benefit the industrialized world.

According to Young, roughly 200 million indigenous peoples throughout the world are embedded in sociopolitical systems over which they have little control. With the recent developments in international affairs, we now have the opportunity to study in a circumpolar context that is significantly

different from socioeconomic and political systems that mostly operate in relatively similar physical and biological environments.

DO HUMANS NEED NATURE?

As in all wilderness management and preservation, a fundamental question recurs: Do humans need nature for our well-being and ability to function in society or can we do without it? If we are to answer this question in the case of the polar regions, we must be concerned not only with the economic values, but also with other dimensions of wilderness like the experiential, scientific, and symbolic/spiritual values. The debate and literature on human-environment interactions are enormous, and I will briefly describe one polar-wilderness management perspective.

Humans relate to their natural surroundings in various ways. E. O. Wilson's "biophilia hypothesis" suggests that there exists a biologically based, inherent human need for nature. The idea is that human relationships with nature have given us evolutionary advantages over other species through time. The other side of the story implies that a degradation of the human dependence on nature will lead to a more deprived existence for humans. The negative effects will not only be material, but also social and psychological. The essence of the argument is the proposition that much of our search for a meaningful, coherent, and rewarding existence is dependent upon our relationship to nature. These relationships are not seen as instincts, but as sets of rules that we learn and different ways of perceiving nature.

The naturalistic experience deals with our direct pleasure and satisfaction derived from contact with nature. Fascination with and wonder about nature are salient motivations in the age of modern outdoor recreation.

Ecological and scientific tendencies of attitudes reflect the desire for inquiry and understanding of the natural world. The ecological approach may be more concerned with relationships and integration, while the scientific tendency claims that the world can be understood through empirical observation without much room for intuition and wonder.

The aesthetic experience has always been important to humankind. Cross-culturally, we find that natural scenes and structures are preferred over human-built ones. However, we know little about the complexity of aesthetics. Or, in the words of Aldo Leopold: "The physics of beauty is one department of natural science still in the Dark Ages."

Symbolism explores how the experience of nature can facilitate communication and thought. Nature is frequently used as symbol in the development of human language. Nature provides endless opportunities for

categorizations and taxonomies. A large portion of our intelligence and frames of references are linked to the diversity of natural systems.

Our emotional attachment to natural elements is reflected in the humanistic experience of nature, wherein we express affection and attachment to both domestic animals and wild nature. This tendency often results in actions of care and stewardship.

The moralistic experience of nature is extremely prevalent in modern nature conservation. Here, we are talking about ethical responsibility to and affinity for nature, fundamental spiritual meanings, and nature's harmony. Indigenous peoples have often been associated with such attitudes where nature is a vivid, living organism of great integrity.

We all recognize the incessant need of modern humans to master and control nature. This trait is often linked to the fact that many people are



*Curlew sandpiper (Calidris Ferruginea) with hatchling, Northern Taymyr, Russia.
(Photo by WWF/Peter Prokosch.)*

afraid of nature. The negativistic experience of nature reflects feelings of fear, hostility, aversion, and antipathy towards nature. There is little doubt that many people have become alienated from natural environments. Indeed, our early conception of wilderness as the home of beasts grew out of negativistic views of nature.

We can identify these domains of human-nature experiences worldwide. Whether or not these sets of attitudes are biologically based is of lesser importance in this discussion. There is some evidence that we are talking about values comprising universal human characteristics. If this carries some truth, the implication may be that the collective effects of our various dependencies on nature can lead to more fulfilling human existences.

I believe we should attempt to find the fundamental rationale for the conservation and sustainable use of polar wilderness in the complex human benefits derived from interaction with natural environments. We are repeatedly reminded that scientific, material, and commodity benefits are inadequate ammunition for protecting wilderness areas. This simply does not stir sufficient public support to influence political systems and decisions. Garret Hardin put this bluntly in his first law of altruism: "Never ask people to do anything they consider contrary to their own best interests." We need a rationale on a different emotional and intellectual level, where it relates to the human quality of life.

THE POLAR IMPERATIVE

Now, what are we up against? The polar regions are peripheral areas, locked in a dependency to the Western world as storehouses of raw materials of great value to industrialized nations. The forces now threatening these environments include oil and gas development, disposal of waste in the ocean, militarization, year-round shipping, and biological resource overharvesting. The effects include air and water pollution, radioactive contamination, degradation of wildlife habitat, and a range of social problems found in the oppression and displacement of native peoples and their traditional ways of life.

If we accept two premises—first, that the polar regions are distinct social and political regions, and second, that the social values and human dimensions of polar wilderness are significant—we see that we need a rather comprehensive wilderness concept. It should reflect local uniqueness and links to the outside world. It must not, however, be just another superimposition of Western needs on the Inuit peoples. The Western wilderness concept is a foreign concept to many indigenous peoples. The polar wilderness

is not a desolate wasteland, but a living wilderness full of people. A wilderness concept and framework for the polar regions must be heavily influenced by the indigenous peoples who live there, and it must also be articulated in a language that is understood in industrialized societies.

Wilderness management and preservation in polar regions are totally dependent upon the type and level of sustainable development of these regions. If wilderness shall continue to exist here, we must take stands on some difficult issues. The polar regions are integral parts of large and volatile international economic systems. Probably the single most important issue in this context for the indigenous societies is a partial decoupling of their local economies from world economies. Others have discussed in more detail how this can be done. According to Dalee Sambo, the Inuit people speak more of sustainable security than of sustainable development. The present resource and management regimes are generally more concerned about ecosystem tolerance and levels of impact in relation to resource harvesting than they are with ecosystem function and security.

The choice here deals with how we support or obstruct local governmental and legal arrangements. The management regimes in polar regions seldom enhance the needs of local peoples, but serve the needs of nations far outside the polar regions. The regimes also accept an incredible level of technological and ecological risk. Oil exploration in the Barents Sea and the disposal of some thirty nuclear reactors off the Russian coast are only two of many grim examples. We should not demand to have land preserved in the North for our emotional interests if we simultaneously degrade the environment through activities serving our needs for uncontrolled growth and deny indigenous peoples access to the resources they require for their livelihoods.

If the "softer" social and intrinsic values on which wilderness management is so dependent shall have any place in the polar regions, one definite requirement is that the Western world supports political, indigenous development. Lots of lessons can be learned from past ventures regarding the political development of the North. The Alaska Native Claims Settlement Act of 1971 awarded land rights only and did not address issues like self-determination or political rights. In later Canadian settlements the mandate has been broadened somewhat. In Norway, however, we still appear to be in the Dark Ages. After thirteen years, a legal commission of bureaucracy tentatively suggested that the Norwegian state and not the Sami people shall have land and water rights where they live. Like in other parts of the world, the indigenous peoples of polar regions must be awarded minimum legal standards if sound land management shall take place. Some success has been realized through the Inuit Circumpolar Conference, the International

Labour Organizations's Convention on Tribal and Indigenous People, and the Rovaniemi Process.

We also need to take a critical look at the role of science in polar regions. The last parliamentary report on Norwegian polar research only accounts for traditional natural science and gives little hope for a better understanding of the social values of the Arctic. How then can we establish the knowledge necessary for development of alternative societal models and resource regimes in the North? I do not wish to discredit the work of natural scientists. The Arctic Monitoring and Assessment Program, for example, is only one of many important projects. However, natural science alone is not sufficient, and it generally supports the needs of the scientific community and our dominant social paradigm of growth and development. Clearly, research on social and cultural issues is also being carried out, but not on funding terms equaling the bastion of natural science. Over and over again, natural scientists have demonstrated their lack of ability to bring forth necessary and often controversial knowledge at the critical time and place, guarding their positions by claiming the need to document everything before a stand is taken.

The current management regimes lay strict limits on how we define *knowledge*. We too often tend to confuse empirical data with knowledge. The immense experience of the Eskimo hunter is barely an anecdote when biologists assess seal populations. A knowledge-based development of the Arctic cannot be born out of biological, geophysical, and economic data alone. On the contrary, it requires value judgments that should be based on extensive local participation, rigorous policy analysis, and scores of normative decisions. Knowledge-based development in the North must permit political development for indigenous peoples that does not seriously disrupt natural systems. Wilderness management is an integral part of such development. This then suggests that social science to a much stronger degree should also set the agenda for natural science in the polar regions. Unfortunately, I do not think the scientific community has all the answers. With our dominant social paradigm, scientific facts seldom make the decisive difference in resource conflicts. I would much rather put my money on nongovernmental organizations who raise public awareness to where it pushes the political systems in desired directions.

In a global perspective, some of the greatest polar wilderness values lie in the vicarious values to the rest of the world, knowing that there may still exist robust lands where wolves stalk the strand lines. Studies of the human-environment systems found here can generate globally needed knowledge. The challenge lies in how we handle our diverse psychosocial needs for nature with sociopolitical development in order to achieve management

systems that are characterized by coherent knowledge, long-lived social values, and some room for intuition, not just reason and fact—the opposite of what characterizes the dominant knowledge system of the Western world.

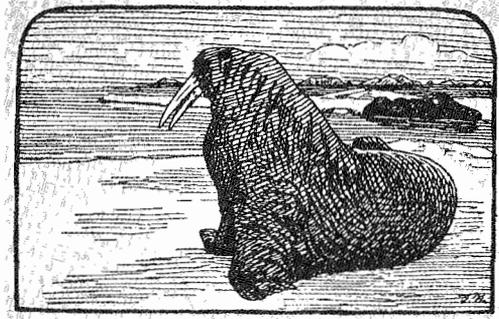
The difference between the industrialized view of the North as a frontier and the Inuit view of the North as a homeland captures the dilemma surrounding the values of polar wilderness. Wilderness management of the Arctic and Antarctic should argue beyond utilitarian considerations. I believe that sensible decisions in the polar regions may positively influence the physical, cognitive, emotional, and spiritual development of many people worldwide. It follows then that sound management of polar wilderness extends far beyond nature conservation and resource harvesting to the fundamental issue of quality of life in a stressed world.

Section III



WILDERNESS— A CIRCUMPOLAR PERSPECTIVE

Polar Wilderness



Walrus sketch by Fridtjof Nansen. (Courtesy of University of Oslo.)

FRIDTJOF NANSEN AND THE SPIRIT OF NORTHERN WILDERNESS

Geir Hestmark

I tell you deliverance will not come from the rushing, noisy centers of civilization. It will come from the lonely places! The great reformers in history have come from the wilderness.

—Fridtjof Nansen (1861–1930)

In late September 1893, Fridtjof Nansen's polar research vessel, *Fram*, was ice-trapped northwest of the New Siberian Islands and began its drift westward and northward over the Arctic Ocean—a journey that would last

three years, take the expedition within four degrees of the North Pole, and finally deliver the ship safe and sound in the strait between Svalbard and Greenland in late summer, 1896. This was a breakthrough in arctic exploration: thirteen men on a human-made island, drifting with the current, the pulse of nature.

In 1888, Nansen and five companions, two of them Sami, were the first to cross the inland ice of Greenland from coast to coast; they did it on skis. Later in life, Nansen often returned to the northern wilderness—to Svalbard, Siberia, and Bear Island.

“What did they seek in the ice and cold?” Nansen posed this question in his history of early arctic exploration, *In Northern Mists*, and answered himself by quoting a medieval Norwegian treatise, *The King’s Mirror*, an instruction book for princes:

When you wish to know what people seek in this land, or why men go there with such a danger to their lives, there is a threefold nature of man which attracts him there. One part is competitiveness and a desire for fame, because it is man’s nature to go where there is hope of great danger, and become famous by that. Another part is a desire for knowledge, because it is man’s nature to want to know and see those parts he has been told about, to see whether they are as described or not. The third is a desire for material gain, because people search for wealth everywhere.

Nansen was a stranger to none of these motives; his expeditions brought him fame, knowledge, and modest prosperity. Not believing the nature of humans to have changed significantly over the years, he also considered these motives relevant to the earliest Arctic settlers, the Stone Age hunters:

... they also have been driven by adventure and the unknown, consciously or subconsciously—so deep in the human soul lies this divine power, the spring perhaps of our greatest actions. In all places and at all times it has driven man forward on the track of development, and as long as the human ear follows the break of waves over deep oceans, as long as the human eye tracks the rush of northern lights over silent snowlands, as long as human thought seeks distant planets in infinite space, so long the adventure of the unknown will lead the human spirit forwards and upwards.

Thus, to Nansen, the exploration of the Arctic wilderness was part of a spiritual quest—the human search for knowledge and understanding.

By profession he was a scientist, and through his research and publications in biology, geography, geology, and geophysics, he contributed enormously to the knowledge and understanding of the Arctic, whether the subject was: changing climates; the nature and causes of ice ages—where Greenland was the obvious contemporary “model”; the origin and structure of continental margins around the deep Arctic Ocean, which he discovered; the chemistry and temperature of Arctic Ocean currents; or living and fossil faunas and floras such as Jurassic ammonites from Franz Josef Land that Nansen collected in June 1896. He wrote in 1890: “Truly, in the scientific investigation of the Earth we do not come very far before we encounter important questions, the solution of which lies in the unknown polar regions.”

Nansen lived in the age of imperialism, of which science is a successful and subtle form. In effect, his expeditions were spearheads of modern European culture into the northern wilderness; and, as a good hunter, he brought this wilderness back to his own culture and prepared and presented it according to local custom and taste, that is, bound in thick, grey volumes of scientific results and also in slightly more colorful popular travelogues and public speeches.

Once within the empire of public knowledge, however, the wilderness is in a sense no longer “wild”—it is known, understood, and tamed. Had Nansen been an exemplary Victorian traveller, convinced of the superiority of contemporary European culture, convinced that the book of progressive natural selection had rightly replaced the hook, and convinced that exploration is meaningful mainly as a prelude to exploitation, then everything would have been fine.

But there was deep tension in his soul. More than once Nansen expressed “nagging doubt about the real justification of this restlessly progressing knowledge.” Would it make humankind happy? A university professor all his adult life, he was also a passionate outdoor skier, hunter, and fisherman, strongly infected by nostalgia for savage nobility. He was also a major inspiration for the sports and wilderness movement among Norwegian youth. He deplored the emergence of modern, industrial, urbanized society, of living and working in boxes, the hurry, and the crowding. “Too much property and consumption,” he said.

In contrast, he admired the native cultures he experienced in the Arctic. After crossing Greenland in 1888, he spent eight months among the Inuit in West Greenland while the expedition waited for a ship to bring them home

to Norway. His book, *Eskimo Life*, is a sympathetic portrait—based on participant observation—of what he felt was the only truly communist society on Earth, founded in natural necessity.

To Nansen, the indigenous cultures of the North—the Greenland Inuit and the Russian Nenets, the latter of which he came to know more closely in 1913—presented lessons in adaptation, humanity’s relationship with the environment, and cultural ecology. He wrote of the Inuit: “Hardly any people is so specifically trained for the life they will lead.”

When equipping his expeditions, he always drew on the experience of the indigenous peoples of the North, most notably the Sami and Inuit. He felt that the imposition of European education ideals on these people could only be a disaster and wrote:

To live, the Eskimo must from early age train the eye and arm for seal-hunting. It is evident that if one removes him from the kayak in the critical age and puts him on the school bench to train the eye to read and the arm to write, one bereaves him the opportunity to become a good hunter. Does the life of an Eskimo become richer, his views greater, because he gets learning from books, when he becomes incapable of feeding his own family and becomes dependent on others?

In the 1920s, when Norwegians campaigned to gain territorial control over Greenland, Nansen firmly stated that the country belonged neither to Denmark nor Norway, but to the Eskimo peoples living there, and that their interests should decide. He felt the best solution would be to leave the Eskimo in peace from all European interference: “It is an old and certain experience, that when a hunting people comes under the influence of the white race and its ‘cultural work,’ it will sooner or later be destroyed and extirpated.”

To those who claimed that the natives did not exploit the natural resources optimally, Nansen replied by pointing to the completely unsustainable hunting practices of European and American sealing and whaling industries: “Was this what one wanted? A few fat years, and then extinction?”

Northern wilderness gave Nansen profound insights into nature and the relationship between humans and the environment, examples of life “simple and true.” There was, however, a dimension where he believed the wild would answer the human quest for understanding: the understanding of humans themselves. Taking the Socratic path, Nansen wrote: “The first thing in life is to find yourself. For this you need solitude and reflection.” He felt the wilderness provided these preconditions of solitude and silence and

concluded: “True wisdom can only be found far away from other humans, in great solitude, through suffering and struggle.”

To Nansen, solitude was also a school in independent thinking, self-reliance, and freedom—attributes of “men of character.” He felt the natural conditions of the Arctic hardened the human will to overcome difficulties. “It is,” he wrote, “a school of manhood and effort.”

But the wilderness also provided lessons on humanity’s dependence on itself. All of Nansen’s Arctic expeditions involved teamwork. The indigenous peoples he so much admired lived in tight, social groups. His diary from the *Fram* voyage reflects his own human qualities. “Science is good enough,” he wrote, “but it is cold, and I long so unspeakably for warmth.”

Nansen considered these lessons in dependence and independence as vital preparation for the humanitarian work he took up after the First World War. The war was a shattering, incomprehensible catastrophe to the rational and progressive forces of European culture. In its atrocity and utter meaninglessness, it erased or even reversed the then accepted anthropological distinction between savage and civilized peoples.

Nansen organized the repatriation of war refugees in Europe; saved, through personal initiative and intervention, millions of Russians from hunger in the wake of the Russian civil war; and similarly saved hundreds of thousands of Greeks and Armenians from the terror and genocide inflicted on them by the Turks. Nansen was the only man in recent history to become “a nation in himself,” with the right to issue passports (the Nansen Pass for Refugees). In a face-to-face exchange with the petty national and political quarrels in the League of Nations, he appealed for love and compassion for all people’s suffering—irrespective of creed or nationality. He received the Nobel Peace Prize in 1922. In speeches, he called for a “Prince of Peace” to step forward, not seeing that to millions of people he had been that prince; millions had received deliverance from this reformer who came from the wilderness.

The northern wilderness would only temporarily give relief to Nansen. His high-strung, multifocused curiosity and his contradicting desires and duties kept him forever longing. His life remained a paradox between the anorak and the necktie, a paradox also found in the World Wilderness Congress.

The greatest serenity he experienced in those moments, it seems, were when he let his immediate perceptions of nature filter through his highly developed aesthetic sensibility and put them to paper in prose or picture. In his art, perhaps, he came closest to capturing the spirit of northern wilderness.



POLAR WILDERNESS: WHAT DOES IT CONTRIBUTE AND TO WHOM?

Fred Roots

Whatever definitions are used for *wilderness*, for those societies that use the term, the polar regions of the world include large areas that are typical examples. The severe and uncompromising physical environment, as judged by human norms of comfort and livelihood, and the general conditions that constrain abundance of life on land and at sea, have caused much of the High Arctic and Antarctic to be considered genuinely *wild*, in most senses of the word, and to almost all societies, since the beginning of recorded history.

The polar wilderness has evoked a strong spiritual and psychological response in humans. One powerful aspect is the stimulation of communication with and appreciation for elemental natural beauty and perspective, solitude and space, the “power of the elements,” and the relationship between humans and their surroundings that has an uplifting and stabilizing effect on individuals and communities. This salutary influence of wilderness, often particularly strong in the polar regions, is increasingly valuable in the industrialized, hurried, and crowded world of today.

But there are other dimensions to the psychological effects of polar wildernesses. Among many individuals and societies that put high value on competition and conquest, the elemental wildness and severity of polar environments have often aroused personal and political challenge, served as a focus for entrepreneurial energy, or stimulated an impulse to battle an uncompromising adversary. The fascination that has been maintained over centuries by the challenge of the search for a Northwest Passage, the race to be

the first to the North Pole or the South Pole, the persistent willingness to tackle polar mega-projects with all the resources and technical ingenuity that can be commanded, and the undying belief that somewhere in the polar regions there must be resources that are enormously profitable, are examples of this powerful aspect of a widespread societal response to polar wilderness.

In strong contrast to either of these quite different responses, among societies that have lived for generations within the severe arctic environment, the same wildness of polar regions has led to an ethos of belonging to nature and immersion within it of long mental perspective, behavioral and cultural accommodation to natural change, and careful observation whetted by severe natural conditions, resulting in an integration of physical, artistic, and spiritual attributes with dimensions quite different from those of societies living in environmentally more benign areas. This, too, is a societal response to polar wilderness.

These distinct responses to the polar wilderness have emphasized and to a degree shaped the differences between those societies dedicated to the dominance of nature and those societies whose success depends upon harmony with nature. They have influenced the course of empires, investments, literature and art, and government policies over the centuries. For better or for worse, all three responses are strongly with us today.

EARLY CONCEPTS OF POLAR WILDERNESS

Although human beings have lived in the Arctic for more than 40,000 years, it remained for Greece, the classical center of recorded scholarship, to begin the process of observation, exploration, and intersocietal interactions that brought the Arctic into the so-called known world. Early Greek scholars, to whom the Mediterranean region was considered the center of the civilized world, were enamored with the geographical and cultural symmetry and balance of the Arctic. They developed concepts of the high latitudes that were not unreasonable for the time and which, in many ways, are still with us. The dark and gloomy forests of central Europe were known to become impoverished towards the colder north; beyond them was thought to be a boreal zone of desolation, inhabited by fierce and miserable Cimmerians, whom Homer described as living in an eternal cold night. However, beyond the mythical Rhiplean Mountains, too far away to be known, where the winter stars sank to rest in the cold and dead sea, the *Mare Cronium*, under the constellation *Arktos* (Great Bear), Hippocrates placed the Happy Hyperboreans, people living under the endlessly shining sky. At the other end of the globe, within the all-encompassing sea, was the *Anti-Arktos*.

Thus, the Arctic and Antarctic were named and were well-established mental wilderness concepts even before those who had these ideas knew anything about them or that they even existed.

The First Polar Wilderness Knowledge

It was within this classical Greek philosophical setting that the merchant explorer Pytheas undertook his extended voyage to the Arctic around 320 B.C. Pytheas' voyage was surely one of the great explorations of all time in terms of its impact on society and human history. Not only did he find the source of tin for which he was looking—tin that was essential for making bronze swords and armor—but he continued north to a land called *Thule* where the nearby sea was frozen. Whether this pack ice in the North Atlantic was Iceland or northern Norway has been much debated, but the fact that the wealth of information brought back by Pytheas was reported and used so consistently by many contemporary and future writers leaves little serious doubt that he reached Arctic latitudes and spent some time there.

Observations of the relative positions of the stars, the midnight sun, the differing lengths of days and nights as the seasons progressed, large sea mammals, and the unexpected phenomenon of the freezing of the sea, which was mystifying and terrible to warm-ocean sailors—all these were new to Mediterranean geographers and scholars. So convincing was Pytheas' information that this one extended voyage significantly enlarged the known world. For example, Pytheas' measurements of the angles of the stars from near what we now call the Arctic Circle enabled the mathematician Erastotenes to calculate, with fair accuracy, not only the diameter of Earth, but also the angle of the "turning of the wheel of the Heavens," which today we would call the tilt of the axis of Earth's rotation. Three centuries before the birth of Christ, Arctic phenomena were widely known in southern Europe and had contributed to science, education, and literature.

The Origins of a Polar Wilderness Fascination

However, Pytheas and his contemporaries contributed more than scientific knowledge and the beginnings of a commercial trade in tin. They provided substance to a pervasive fascination with the polar regions, a sense of wonder and excitement about polar areas both attractive and repelling, that has persisted for two thousand years. In the Arctic, the lands under the constellation of the Great Bear, even the most commonplace and dependable acts of nature such as the rising of the sun in the morning and its setting in the evening, were strange and different. Beyond the Arctic Circle, the sun went round and round in the summer without setting and during the winter solstice it did not rise at all. The cold was overwhelming and deadly, but

there was no Greek element for cold in Middle East religions. Here, the sea froze. Great mountains of ice floated on the ocean. Strange shafts of light danced in the heavens. The great White Bear stalked the ice, and creatures that looked part human, part dog, and part fish, some with tusks like elephants, slid from the ice into the frigid waters. The mariners' magnetic lodestone spun endlessly without settling to point towards Polaris, the North Star.

Through the centuries, these polar phenomena have been explained. But the sense of wonder and the magic of nature in the high latitudes has remained and even intensified. It is part of every northern society's culture, both those peripheral to the Arctic and those indigenous to it, although expressed in quite different ways. It is a part of our sense of "wilderness."

European Fascination with Polar Wilderness

In the development of European-based global empires and the spread of industrial civilizations, the challenges and fascinations of polar regions have held a special place. In the sixteenth to eighteenth centuries, the polar regions were seen mostly as obstacles on the way to somewhere else. The nature of those obstacles, the essential wildness and the need for fortitude, perseverance, and ingenuity to overcome them, gripped the minds of the public, investors, royalty, and politicians. The ostensible motives for European activities in the Arctic—and, after the late eighteenth century, in the Antarctic—ranged from political hegemony to commercial exploitation to patriotic national competition and to the quest for scientific knowledge. Each of these motives found its expression against a backdrop of an overwhelming polar-wilderness consciousness. One need only think of the magic still evoked by the expression "Northwest Passage" among people who know little about the Arctic, or consider the swashbuckling Frobisher or single-minded, competent Amundsen, the idolatry of Nansen, the controversy that still surrounds Peary, Cook, and the North Pole, or the sentiment still attached to the fates of Barents, Franklin, Andréé, or Scott, to see that the polar wilderness as a setting for human achievement or failure, is a powerful part of our collective psyche.

The political maps of the Arctic and Antarctic have been determined more by the psychology of polar wilderness than by economics or military prowess. Some of this fascination is also evoked by other wild places such as tropical jungles or deserts, but the fact remains that in every European country and America, reprints of old books on polar exploration greatly outsell old books about the jungles or deserts.

The Indigenous View of Polar Wilderness

For people who live in the polar regions—and here one can speak only about the Arctic—the wilderness fascination has other dimensions. All indig-

enous societies that have developed near the boreal tree line or north of it have been able to prosper within the Arctic environment because they have become a functioning part of the regional ecosystem.

In such societies, human activities are not imposed upon the processes of nature and do not exist through an exploitation of "resources," but are an integral part of the flow of material, energy, and the natural driving forces of the environmental system. Such integration must apply to attitudes and understanding as well as to physical activities. When one belongs to and is immersed in such a system, the concept of "wilderness" in the European context, as a region or condition relatively unaffected by humans and to be contemplated from a distance, does not exist. However, the concept of "wilderness" in the sense of nature functioning without conspicuous human intervention or disruption is strong. The natural wilderness concept must apply also to oneself, no matter how technologically sophisticated one is, as much as to other species or inanimate environmental processes.

Such a concept, a pervasive sense of belonging to the land and ecosystem, is fundamental to being an indigenous person in the Arctic. That consciousness includes a responsibility to maintain the fully functioning system, including adapting the behavior of its human components. The concept of being integral with wild land does not include impairing or distorting part of the natural system for some narrow human gain and then treasuring some remaining undisturbed portion as "wilderness."

POLAR WILDERNESS IN THE MODERN CONTEXT

The various concepts of polar wilderness noted above, which have been developing for two thousand years in Europe and undoubtedly much longer in indigenous societies, are still valid, and they contribute to our cultures and our economic and political decisions. However, in the past few decades, some new ways have been determined in which polar wilderness contributes to society, and possibly to our future. One might crudely categorize these as commercial, political, and scientific uses of polar wilderness.

Commercial

Modern transportation, communications technology, and the increased wealth among people have made it possible to capitalize on the widespread public interest in the polar wilderness by arranging for people to experience it for themselves. The age of heroic expeditions for the few, resulting in vicarious adventure through books or films, is being superseded by an age of mass tourism. In 1991, it is likely that more people went to the North Pole

and through the Northwest Passage for pleasure than had done so in all of previous history for any reason.

With the decrease of military expenditure in the Arctic, and the decline of prospects for major revenues from exploitation of Arctic resources under present economic conditions, many northern countries and entrepreneurs are looking towards tourism as a source of income for the Arctic. A similar phenomenon is occurring in Antarctica.

Because wild areas and large numbers of visitors are fundamentally incompatible, significant compromises have to be made to achieve what is fondly called a *wilderness experience*. The typical tourist usually wants to be comfortable and safe and return to urban areas on schedule, yet desires to feel the thrill of a (controlled) polar challenge. Tour operators, naturally in the business for money, want their clients to be satisfied, but they are increasingly restricted by environmental controls and worried about insurance, and consequently must make many concessions away from true polar wilderness experiences. The polar tourism business, still young, is full of contradictions. It has a strong basis in the fascination for polar wildness, but the more successful examples seem to be moving from "wilderness" as such to marketing the uniqueness of high-latitude landscapes, nature, and cultures.

A particularly important aspect of opening the Arctic "wilderness" to commercial tourism is the role played by Arctic residents. In some parts of the circumpolar Arctic, governments and southern commercial interests (e.g., international tour companies and some airlines) have attempted to develop a tourist industry that exploits the local indigenous peoples and their cultures as objects of curiosity and caricatures of life in the wilderness. Fortunately, in several parts of the Arctic, the indigenous peoples are taking initiatives in cultivating and directing the tourist demand for polar-wilderness experiences, which has beneficial results for the tourist, the residents, and the polar environment.

Political

The changing concept of polar wilderness has recently achieved new political dimensions. Political interest in polar regions has ranged from territorial aggrandizement and prestige to economic exploitation to military geopolitics and to mechanisms for international conflict resolution. The wilderness aspect of most of these concerns has been seen by governments as an obstacle, an expense, or a passive defense against foreign attack. At the same time, the intriguing attraction of polar wildness has infected politicians and governments in temperate societies (since England's Queen Elizabeth) that have sponsored polar operations for what sometimes seemed irrational reasons.

For Arctic residents, the political interests of southern governments in Arctic lands and resources are real or potential encroachments on their homelands for purposes that hold little value for Arctic societies. Ever since the Norwegian nobleman Othere began in about A.D. 876 to tax the inhabitants of Kola Peninsula rather than trade with them as partners, the concept of polar wilderness as something different and strange when viewed from afar has been politically separated from the integrated, indigenous sense of polar wildness.

Now, however, environmental concerns are to the fore in political agendas. In polar regions, this new priority appears to be bringing about a profound political change, in which the wilderness concept is central. Areas that had been considered to be wilderness because they had somehow escaped being conspicuously messed up by humans have now become precious heritages and valued treasures, indicators of both what we are losing and hopes for the future.

Polar wilderness plays an important role in shaping new national and international concerns for environmental protection. The susceptibility of conspicuously pristine-appearing landscapes and ecosystems to disturbance from far-traveled pollution, the clear evidence that living resources in polar lands and seas are vulnerable to overexploitation, the indications that environmental change due to planetary warming from greenhouse gases will be greatest in Arctic latitudes, the growing appreciation that the knowledge of Arctic indigenous peoples has much to contribute to other societies in learning how to manage resources and adapt to environmental change—all these, added to the fascination with polar wilderness, have affected recent politics. Every northern country now has policies protecting the northern environment and promoting (except Iceland), however ineffectively, the rights of northern indigenous peoples to manage their natural resources. Several countries are setting aside Arctic areas as parks or biosphere reserves, not because they are spectacular playgrounds but because they are valuable wilderness areas in themselves.

The 1991 Environment Protocol to the Antarctic Treaty signals a truly remarkable step in international polar-environment relations. It is a multilateral, legal agreement that prioritizes protection of the Antarctic environment ahead of other political, economic, tourist or private adventure, or scientific activities. The protocol is the result of twelve years of negotiations, beginning with discussions on regulations for mineral exploration. However, its deeper significance may not yet be fully realized until signatory nations develop and adjust their own laws to comply with it. The Antarctic Environmental Protocol will undoubtedly have a profound effect on the Arctic and other wilderness areas.

In the Arctic itself, the eight-nation Arctic Environmental Protection Strategy is directly concerned with wilderness areas. The strategy was reconfirmed in September 1993 by ministers of all eight Arctic countries in Nuuk, Greenland. Its major program's first project involved a compilation of all legally protected natural areas in the Arctic, with an analysis of the responsible authority and degree of protection. Another project is concerned with international cooperation to protect critical Arctic habitats and the integration of traditional indigenous knowledge and technological science into policies for the protection of Arctic flora and fauna. Other international developments, such as the United Nations Economic, Social, and Cultural Organization's Man and the Biosphere program and the parliamentary declaration issued at the Arctic Conference of the Nordic Council in August 1993, attest to the consolidating political and policy importance of polar wilderness for its own sake and for its contribution to wider issues.

An important new dimension in polar wilderness issues and values is seen in the growing political power of northern indigenous peoples. A significant development is the comprehensive set of economic, human rights, environmental protection, and sustained resources-management recommendations issued by the Inuit Circumpolar Conference in association with the Nordic Sami Council and the Association of Small Peoples of the Russian North. These policy recommendations, from people who live in the North and are part of its wildness, add a powerful new perspective to our view of polar wilderness and the management of Arctic territories. They integrate the northern environment, resources, and people in ways that are uncomfortable for most southern Europeans and Americans and are not compatible with the compartmentalized responsibilities of established government structures. Above all, they integrate wildness and nature with human affairs. The logic is, however, indisputable. These concepts from the northern indigenous peoples have influenced international politics, as reflected in the 1992 Río Declaration and Agenda 21 of the United Nations Conference on Environment and Development. At the national level, indigenous polar wildness concepts underlie the course of Sami parliaments, the rights and governing structure of the Nunavut Territory in Canada, land-use negotiations in Alaska, and the policies of Greenland's Home Rule government.

Scientific

That the polar regions have immense and irreplaceable value for the modern study of Earth processes and environmental change is obvious. Much of the value lies in the relative "wilderness" nature of polar areas. Their remoteness from major sources of pollution (and the contrast in environmental response to pollution such as in the Kola area); the relative simplicity

of polar marine and terrestrial ecosystems; the dramatic biological and environmental expressions of changes in solar energy flux, atmospheric chemistry, ocean surface conditions; and other factors make it possible to observe, measure, and understand many environmental interactions more clearly in polar regions than is generally possible in most other parts of the world. Added to these natural advantages is the distinct disadvantage that it appears that present wind and ocean currents carry a large portion of long-lasting pollutants and toxins released anywhere on the planet to the Arctic, where they become incorporated into the food chain and thence into the foods of Arctic residents. It is also clear that the environmental change due to planetary warming, likely to occur in the next century, is expected to be greatest in the Arctic. Therefore, the critical importance of the Arctic to major scientific issues of today is undisputed.

The Antarctic also has new scientific importance. Studies there provide the scientific "anchor" to investigations of global change—the validation of atmospheric circulation models, the effects of changes in stratospheric chemistry (e.g., the so-called ozone hole), the worldwide distribution of pollutants (e.g., DDT in penguin eggs), and others. All of these scientific contributions depend upon maintenance of the "wilderness" character of the Arctic in as undisturbed a state as possible.

The first large international multidisciplinary research program carried out in the polar regions was the International Polar Year (IPY) 1882–83. This pioneering study, involving fourteen simultaneous polar expeditions and coordinated observations in twenty-five countries, had a significant influence in moving international concepts of science from separate, narrow nationalistic enterprises into an openly shared arena. The open nature of science is now accepted as normal, but it was considered radical during the IPY and resulted from a realization of the mutual benefits of international cooperation in the study of polar wilderness. The IPY was followed by the Second International Polar Year of 1932–33 and then the International Geophysical Year of 1957–58, which for the first time opened all parts of Antarctica to international research—an action that led to the Antarctic Treaty. In these ways, polar wilderness science influenced recent world history.

And now, a significant portion of world scientific effort is embarked on the successor to these programs. What began a century ago as internationally coordinated, precise observations of physical phenomena in the polar wilderness has developed into the largest, most comprehensive and, in many ways, most important, endeavor ever collectively attempted by the scientific community: the International Geosphere-Biosphere Program, or Study of Global Change. Global change studies are not only investigating the characteristics and processes of the Earth as a whole, they are also investigating

what is happening to the planet's inhabitants—including humans—and determining what the future holds, as humans increasingly interfere with their natural environment. Polar wilderness plays an essential role in this study. In addition to the natural polar attributes mentioned above, one need only think of the depletion of stratospheric ozone at high northern and southern latitudes, the high-latitude distribution of radioactive fallout from a malfunctioning mid-latitude nuclear reactor, or the presence of toxic residues from tropical rice paddies in the livers of polar bears in the Arctic to see the importance of polar wilderness studies.

What do polar wildernesses contribute? They have provided essential elements of history, culture, knowledge, psyche, and spirit, for better or for worse, for at least the past 2,300 years. Today, particularly, they are important to our self-awareness, our environment, and to what actions we can take towards a sustainable future. To whom do they contribute? To each of us, no matter where we live.



POLAR WILDERNESS AND BIODIVERSITY

Peter Johan Schei

Polar regions are generally diversity-poor with relatively few endemisms. There are naturally great differences between the marine systems of the Arctic and the cold-isolated Antarctic terrestrial wilderness. Even in marine diversity, the differences are profound between a more historically stable and, hence, biologically controlled environment in the South with highly specialized species and benthic diversity and the *generalis* species of the North, which are much more adapted to a physically controlled environment. Their adaptations to extreme environmental conditions and the pristine nature of their environment, however, imply that the species and ecosystems of polar areas should be of no less importance and have no less significant management priorities than the richer temperate and tropical systems, particularly relating to conservation and sustainable use of marine diversity.

There is a general need for increased attention and priority regarding conservation and sustainable use of polar marine diversity in the follow-up work of the biodiversity convention. This relates particularly to the Arctic with its many indigenous peoples and cultural diversity and the increasing and conflicting industrial activities in the area. In Antarctica, the situation is of much less concern, particularly after the establishment of the Environmental Agreement in 1991.

More than 250 protected areas (designated in World Conservation Union categories I through V) cover some 1.8 million square kilometers or 13.4 percent of the Arctic. Northeast Greenland Park roughly constitutes 50 per-



*The cloudberry, harvested only from the wild, is a staple food of the Arctic region.
(Photo by Tapio Tynys.)*

cent of this area, and there is still far from satisfactory protection of most ecosystems and habitats.

RECOMMENDATIONS

1. A regional Arctic agreement on biodiversity should be established under the Arctic Environmental Protection Strategy process as soon as possible.
2. A system of activity zones, regulating possible detrimental activities, should be established and a particular biodiversity impact assessment procedure for controlling such activities should be developed.
3. A compatible biogeographical categorization of Arctic habitats should be developed as soon as possible.



WILD RIVERS OF THE NORTH: A RECONNAISSANCE-LEVEL INVENTORY

Michael McCloskey

Humanity is preoccupied as never before with understanding the ecological health of the Earth. One way to gauge its health is to examine the status of its rivers because they are sensitive reflectors of the watersheds around them. The healthiest rivers are those that are least modified. Thus, one measure of river quality is the proportion of rivers that are still wild.

The wildest rivers also provide benchmarks against which we can measure the health of other rivers. For example, characteristic biota in the riparian zone and associated subsurface areas are most likely to flourish in wild rivers.

To provide information about such rivers and the proportion of them remaining, we have begun identifying the remaining wild rivers in the world by looking at the status of rivers generally north of 50 degrees latitude. This zone is probably richer in wild rivers than others because of limited settlement and the fact that land masses are concentrated in the Northern Hemisphere. The fate of rivers here is probably a sensitive indicator of trends in the planet's health. This paper presents the results of a study that focused on Canada, Alaska, Scandinavia, and Russia.

METHODS

The concept of wild rivers began in North America as an expression of interest in the recreational use of rivers. Wild rivers, in this sense, provide

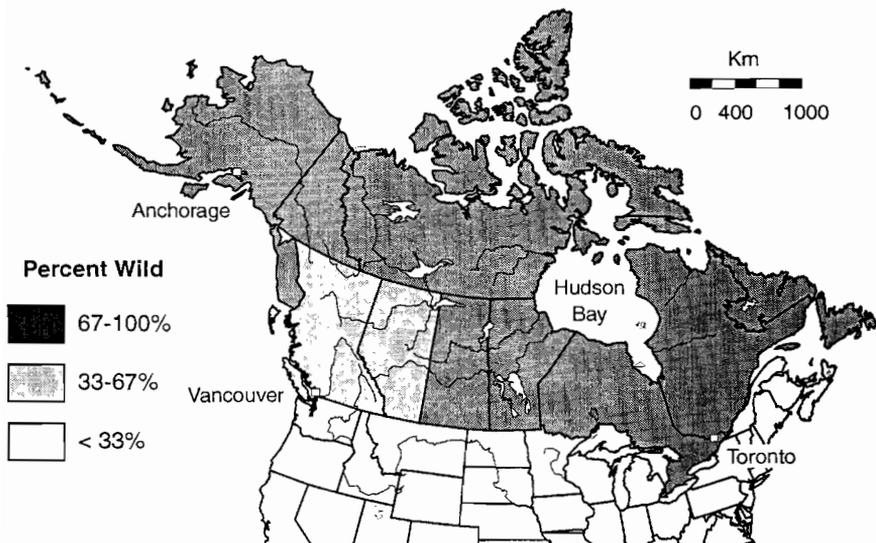
good opportunities for rafting, kayaking, and canoeing by virtue of being free of dams. However, in a broader context, wild rivers also imply naturalness. In this survey, we looked for unimpounded rivers with relatively undisturbed banks and beds. We also looked for rivers with good water quality and natural stream flow patterns. These rivers most likely still support their characteristic natural flora and fauna. We eliminated reaches of rivers downstream from dams because their stream regimes were altered. We did not eliminate rivers crossed by bridges, but we did eliminate those with roads running along their banks.

We included only those river reaches that were at least 50 kilometers in length. This length was arbitrary in nature, but it was chosen for a number of reasons. The U.S. Bureau of Outdoor Recreation specified 50 kilometers to be the minimum length needed to provide a significant wilderness experience. Such rivers are likely more able to support most of their characteristic biota. And most importantly, this was a reconnaissance-level survey. We did not have the means to look at all rivers. We were trying to develop a general, overall picture. Identifying rivers of at least this length was manageable and fit our methods. Clearly, wild rivers of lesser length can be important and may provide noteworthy recreational experiences. However, those rivers need to be identified and their characteristic biota analyzed.

The term *wild rivers* has been used to describe rivers that are wild from their source to their mouth. We did not use the term in that sense. In some cases, the rivers identified may be wild their entire length, but in most cases, they are merely wild from their source to some point 50 kilometers or more downstream. At that point, the rivers may be intersected by a dam or, more likely, they move into settled country.

This study used a methodology similar to that used in the reconnaissance-level inventory of world wilderness, which is based on inferences derived by looking at the density of development shown on maps. We used the best available maps that showed all types of roads and all settlements. Using these, we identified "wildland zones," which were lightly settled areas with few roads. In many instances, they included de facto wilderness blocks and areas with a few, low-standard roads and small settlements. We inferred that such areas were not likely to have been significantly changed in their natural character. Rivers flowing through such zones were identified and measured using a map-measurer, except in the Russian Federation where we used a sampling technique to estimate the number of wild rivers. However, we eliminated all river reaches affected by dams shown upstream on the maps. The *International Register of Dams* was also used to identify all known dams of any consequence.

Northland Wild Rivers Study Canada and Alaska



NORTH AMERICA

Most northerly rivers in North America are still predominantly wild. Of the rivers north of 50 degrees latitude that are at least 50 kilometers in length, 75 percent are still wild. The average length of these wild rivers is 125 kilometers. There are 1,917 wild rivers in North America. Of these, 1,498 are in Canada, and 419 are in Alaska. While Greenland was considered part of the North American region, it has only a few rivers, and none met the 50-kilometer threshold.

As one might expect, the most northerly areas are still the wildest. All of the rivers in the Northwest Territories, more than 98 percent of those in the Yukon Territory, and 97 percent of those in Alaska can be thought of as wild. However, these northerly areas are not shielded from airborne pollutants such as acidification from Arctic haze drifting across the North Pole from Eurasia and PCBs and other organochlorines from remote sources.

Most of Canada's remaining wild rivers are found north of the heavy settlement belt—north of 53–54 degrees latitude north. Surprisingly, the larger provinces east of the Rocky Mountains have higher percentages of rivers still wild than those to the west of that range. This may be explained partly by the fact that the Laurentian Shield has limited settlement in the southern portions of the eastern provinces. Also, the western provinces may have fewer rivers still wild at comparable latitudes because their mountainous

nature has provided suitable sites for hydroelectric development. Moreover, sheltered valleys invited northerly tending settlement patterns.

Furthermore, whereas 70–76 percent of the rivers in the provinces east of the Rocky Mountains are wild (76 percent for Newfoundland/Labrador, 74 percent for Ontario, 70 percent for Saskatchewan, and 69 percent for Manitoba), less than half of the rivers in the provinces to the west are still wild (47 percent in British Columbia and 41 percent in Alberta). The Maritime Provinces were devoid of wild rivers under our definition partly because they were too short (i.e., under 50 kilometers) and more so because of pervasive development (20 percent of New Brunswick's rivers are wild, 16 percent of Nova Scotia's, and there are none on Prince Edward Island).

Three rivers included in the total figures for Québec are threatened with imminent damming in the further development of the huge James Bay hydroelectric project. They are the Nottaway, Rupert, and Broadback Rivers. The study did not include the Eastmain and Great Whale Rivers, which are presently being developed. Other massive hydroelectric schemes are also proposed in Ontario west of James Bay.

However, some rivers in western Canada were just rescued from being dammed. Both the Tatshenshini and Alsek rivers in British Columbia and Alaska were threatened by pollution from a massive copper mine in their drainage basin. They were on a list of the ten most endangered rivers in America. The British Columbia government, which controls most of their watersheds, recently acted to block the mine by putting the areas into a protected area that totals 8 million hectares (counting two already protected adjacent areas and this addition).

When the lengths of all the wild rivers in Canada and Alaska are added together, they exceed 222,000 kilometers. The two jurisdictions with the greatest totals of wild river reaches are Alaska (53,765 kilometers) and the Northwest Territories (41,250 kilometers). Most of the rest of Canada's provinces have only one-half to one-quarter as much as these areas (e.g., Québec has 22,710 kilometers, and Saskatchewan has 13,775 kilometers).

Thus, about half of the total of North America's wild-river inventory is found in the zone north of 60 degrees latitude—in Alaska, the Yukon Territory, and the Northwest Territories. The other half is generally found in the zone between 53 degrees latitude north and 60 degrees north.

The longest wild rivers in the northern portion of North America are the Yukon River (Alaska), Mackenzie River (Northwest Territories), Back River (Northwest Territories), Kuskokwim River (Alaska), Koyukuk River (Alaska), North Angling River (Manitoba), Peace River (Alberta), Thelon River (Northwest Territories), Albany River (Ontario), and Severn River (Ontario). Among the 20 longest wild rivers, there is one over 2,000 kilometers, three between 1,000 and 2,000 kilometers, and fourteen between 500 and 1,000 kilometers.

Most of the longest wild rivers (over 1,000 kilometers) are north of 60 degrees latitude.

Most of the Canadian rivers are in the Canadian taiga region, although some are in the Rocky Mountain biogeographical province, Canadian tundra region, and Sitkan Province. The Alaskan rivers are primarily in the Alaskan taiga or tundra regions.

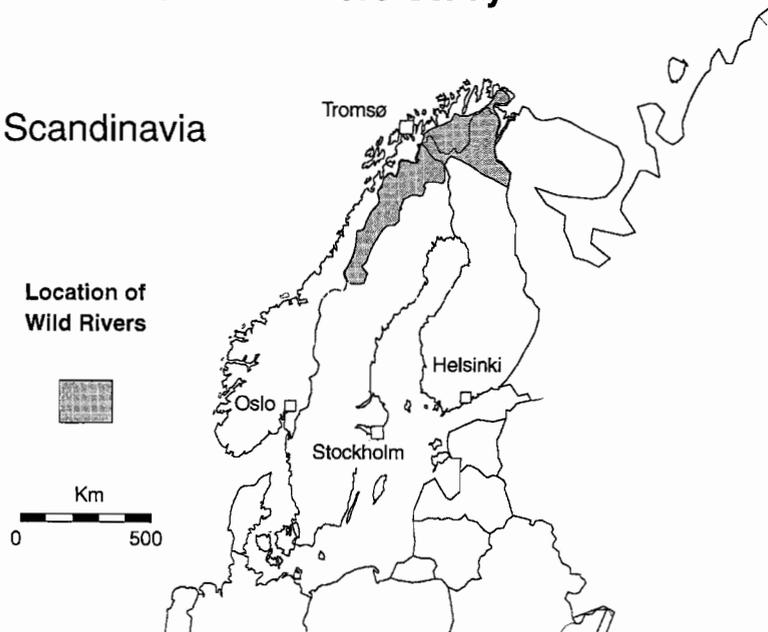
SCANDINAVIA

The Scandinavian countries of northern Europe have relatively few rivers left that appear to be still wild. Approximately 11 percent of the rivers in Iceland, Norway, Sweden, and Finland are wild. Fifty-five rivers fall into this category, and the average length of these rivers is 73 kilometers.

Most of the rivers are in the extreme northerly portions of those countries above the Arctic Circle. They are north of 65 degrees latitude in Sweden and Iceland and north of 68 degrees latitude in Norway and Finland. In Iceland, they are predominantly on the north side of the island. Whereas most of the wild rivers in Finland and Norway are found in and around various nature reserves, in Sweden and Iceland they are mostly outside of such reserves.

The spread of settlements far north in these countries, along with an extensive network of roads and many dams, accounts for the low percentage of

Northland Wild Rivers Study



wild rivers. However, Norway's figures may be somewhat distorted because many of its rivers did not meet the 50-kilometer threshold. Norway does have a system that protects its wild rivers; 20 percent of the country's hydroelectric potential is devoted instead to protection of its river systems.

Iceland has more wild rivers left than the other countries—25 percent. Norway and Finland have about 10 percent and Sweden has about 9 percent of their rivers still wild.

Scandinavia has 3,990 total kilometers of wild rivers; of these, Sweden has 1,355 kilometers, Finland has 965 kilometers, Norway has 855 kilometers, and Iceland has 815 kilometers. Of the fifty-five wild rivers in Scandinavia, thirteen are in Finland, thirteen are in Iceland, eighteen are in Sweden, and eleven are in Norway.

The ten longest wild rivers in the region are in the main body of Scandinavia, with none in Iceland. The top five are all over 100 kilometers in length. Five of the top ten are in Sweden, three are in Finland, and two are in Norway.

In terms of Udvardy's system of biogeographical classification, most of the Scandinavian wild rivers are in the West Eurasian Taiga Province. A few in extreme northeastern Norway are in the sub-Arctic Birchwoods Province. Those in Iceland are in the Icelandic Province.

THE RUSSIAN FEDERATION

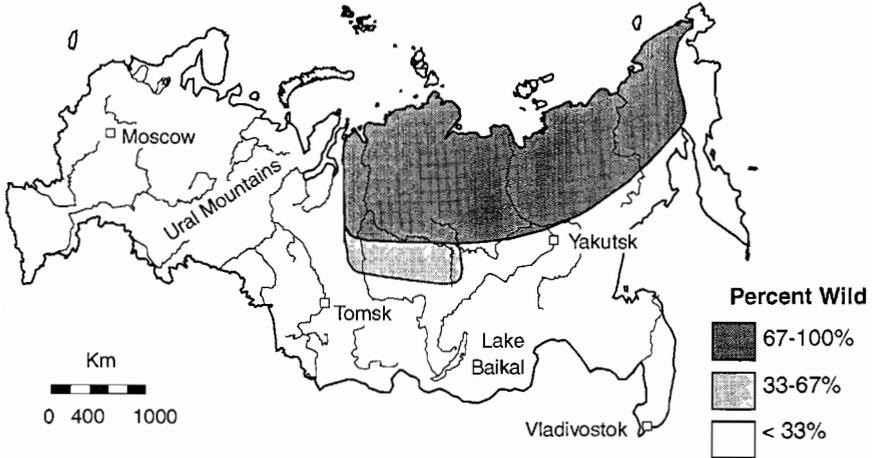
The Russian Federation has a smaller percentage of wild rivers than one might expect. Only about 32 percent of its rivers are still wild. The average length of wild river components is 143 kilometers. All told, there are 1,650 wild rivers in the Russian Federation.

The highest density of wild rivers is found generally east of 85 degrees longitude and north of 63 degrees latitude (in the region running eastward from there to the Pacific Ocean and northward to the Arctic Ocean). In this region, which is mostly in Siberia, two-thirds or more of the rivers are still wild, although the rivers nearer the Arctic Coast are subject to acid precipitation. Some areas are heavily impacted by oil drilling (e.g., the area just west of the Yenisey River). Heavy coal deposits underlie the western portion of this zone and may prompt later development. This region is primarily found within the boundaries of the Yakutia-Sakha Republic, Krasnoyarsk Subordinate Autonomous District, and Magadan Oblast.

There is a belt in Siberia that runs south of this sector, down to about 60 degrees latitude and between 85 degrees and 110 degrees east longitude, which harbors a medium density of wild rivers. This region is north of the Trans-Siberian Railroad and the Baikal-Amur line. In this region, between one-third and two-thirds of the rivers are still wild. However, the region has potential for oil and gas development.

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Russian Federation



The rest of the territory in the Russian Federation supports a low density of wild rivers. Less than one-third of the rivers there are still wild. No wild rivers are found at all in the European portion of the federation. Wild rivers are scarce between the Ural Mountains and Lake Baikal. Some shorter wild rivers are found in the Altay and Sayany regions in Tuva.

Seventy-two percent of the total length of wild rivers in the federation is found in the northern portion of the Siberian region, which has a high density of wild rivers. About 16 percent of the total length is found in the region with a medium density of such rivers, and only 12 percent is found in the rest of the country.

The combined length of all wild-river components in the Russian Federation is 235,717 kilometers. Of this, 170,491 kilometers are in the High Density Region (northern Siberia); 37,881 kilometers are in the Medium Density Region (central Siberia); and 27,345 kilometers are in the Low Density Region (the rest of the country).

The twenty longest wild rivers are found from 59 degrees to 79 degrees north latitude and from 69 degrees to 160 degrees east longitude.

Some of the longest and best-known rivers in the Russian Federation are not included in this list because they are in heavily developed areas, badly polluted, and/or often dammed. More surprisingly, the major rivers flowing north into the Arctic Ocean are not included because of heavy levels of pollution. These rivers include the main stems of the Ob, Yenisey, Lena, and Kolyma rivers. The Amur River, which flows into the Pacific, is also ex-

cluded. Major industrial cities in southern Siberia discharge huge quantities of pollution into the headwaters of these rivers, which carry the contaminants north into the Arctic Ocean.

The Ob River is polluted by industry in cities such as Omsk and Tomsk. Krasnoyarsk pollutes the Yenisey River, and Irkutsk pollutes the Angara River. The Lena River is polluted by Yakutsk and other cities. Some of the polluting cities are so-called secret cities that manufacture nuclear, chemical, and biological weapons. The rivers are contaminated by radioactivity, heavy metals, DDT, PCBs, and viral agents. Little has been done to control pollution from the industrial belt in southern Siberia or elsewhere. In this inventory, only tributary rivers flowing from unpolluted and relatively undeveloped areas were included.

The overall low percentage of wild rivers remaining in the Russian Federation is due to a combination of circumstances. Heavy patterns of historic development in the European part of the federation explain the absence of rivers in the inventory (as well as a binge of dam-building and pollution). In the Asiatic portion of the country, the low figures are accounted for by heavy development in the south and the high levels of pollution in major rivers flowing northward. Moreover, even in some northern regions communities are found, reflecting the policy of promoting northern settlements. The prevalence of oil-drilling and mining (e.g., diamond mining) in northern regions also accounts for exclusions.

Some observers think that the percentage of wild rivers in the Russian Federation could be even lower than these estimates because of the paucity of good data on mining sites. Controversy exists over construction of dams in this northernmost wild zone. For instance, hydroelectric dams have been proposed near the head of the Vilyuy River and on the Adycha River (a tributary of the Yana River), though public opinion has stopped both for the moment.

When the figures for the three northern regions that were studied are combined, they reveal that nearly 45 percent of the rivers in these regions are still wild (and 55 percent of them are compromised). All told, there are 3,626 wild rivers of at least 50 kilometers in length; they total 462,140 kilometers in length. The average length of a wild river in the North is 114 kilometers. Most of these rivers are found north of 62 degrees latitude. The longest wild river is the Yukon River, which is 2,800 kilometers long.

Despite the fact that the Russian Federation is one-and-a-half times larger than Canada and Alaska combined, it contains only slightly more wild rivers (14 percent). The Russian Federation has 235,717 kilometers of wild rivers in contrast to 220,000 kilometers in Canada and Alaska combined. This is explained both by the high levels of pollution in the Russian Federation and the more northerly patterns of development. In both countries, the wild rivers are concentrated north of 60 degrees north latitude, though in Canada wild rivers are plentiful south to about 53 degrees latitude.

Northland Wild Rivers Study

Comparison of Regions

	Percent Wild	Density (km/km ²)
Canada/Alaska:	75%	.019
Russian Federation	34%	.016
Scandinavia:	11%	.003

In terms of percentages, Canada and Alaska have left 75 percent of their wild rivers in good condition, whereas in the Russian Federation only 34 percent of the rivers are still wild. It is worth noting that Scandinavia has the lowest percentages of rivers still wild (11 percent), though it does have relatively more than European portions of the Russian Federation.

The regions can also be compared by developing a ratio of total wild river lengths compared to overall territorial size (kilometers/square kilometers); this provides an index of wild river density. Canada's density is 0.019 (including Alaska); the Russian Federation's is 0.016; and Scandinavia's is 0.003.

This inventory suggests that survival of wild rivers is both a result of geography and policy. Policies in the Russian Federation of promoting development in northern regions, hydroelectric development, and slighting the importance of controlling pollution have left its river systems much diminished in quality. Nonetheless, there is still much left worth preserving.

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Comparison of Regions

	Combined Lengths (km)	Number of Wild Rivers	Average Length (km)
Canada/Alaska	222,433	1917	125
Russian Federation	265,130	1854	143
Scandinavia	3,990	59	73

ACKNOWLEDGMENTS

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Management and Administration



International expedition camp: A group of biologists from the Moscow Academy of Sciences with lemming traps. Pjassina Delta, Taymyr, Russia. (Photo by WWF/Peter Prokosch.)

A COMPARISON OF THE LEGAL ENVIRONMENTAL REGIMES IN THE ARCTIC AND ANTARCTIC

Carola Bjørklund

In the early 1990s, comprehensive environmental regimes were developed for both the northern and southern polar areas. In 1989, the Finnish government initiated the Rovaniemi Process to focus on the environmental challenges in the Arctic. As a result, two years later, the ministers of the circumpolar nations—the Nordic countries, Russia, the United States, and Canada—endorsed a strategy plan on how to meet the environmental challenges in the Arctic. The participating states committed themselves to implementing the decisions endorsed at the Ministerial Conference in Rovaniemi

in June 1991, and to further develop the programs when necessary. Simultaneously, the consultative parties to the Antarctic Treaty started to develop a comprehensive environmental regime for the Antarctic.

A variety of environmental arrangements exists in the Arctic and in Antarctica. The most comprehensive regime in the Arctic is the environmental program involved in the Rovaniemi Process. In the Antarctic, the equivalent document is the Protocol on Environmental Protection to the Antarctic Treaty.

THE ANTARCTIC TREATY

Though the Antarctic Treaty of 1959 had a rather general scope and did not contain any specific references to the environmental protection of Antarctica, this did not prevent the consultative parties from undertaking intensive legislation in this field. Hundreds of recommendations have been aimed at specific environmental protective measures in Antarctica, but their legal status has been uncertain.

This uncertainty has to be analyzed in the light of the specific characteristics of the Antarctic Treaty System (ATS). The ATS is not an international organization and, therefore, does not possess the institutional procedures and enforcement authority one finds in an international organization with regulative authority. However, this lack of authority has not hampered the consultative parties from regulative activities. Based on a concept of "special responsibility," the consultative parties issued a wide range of environmental protective measures for the Antarctic.

There had always been close cooperation between the Scientific Committee on Antarctic Research (SCAR) and the ATS which made it possible for the consultative parties to define and correctly identify environmental challenges. Measures proposed by the SCAR led to the adoption of the Code of Conduct for Antarctic Expeditions and Stations Activities. The SCAR's research also led to the development of policy guidelines in Antarctica, which recommend that:

- no activity should be undertaken that could modify the extensive Antarctic;
- all measures should be compatible with the interests of humankind; and
- the incorporation of the concept of monitoring environmental changes should be respected.

The Convention for the Conservation of Antarctic Seals, the Convention on the Conservation of Antarctic Marine Living Resources, and (later) the

Convention on the Regulation of Antarctic Mineral Resource Activities were all developed in close cooperation with SCAR. While these instruments address specific parts of the whole environment, the agreed measures for the protection of the entire Antarctic environment that were later developed demonstrate a new era in environmental thinking by the consultative parties in Antarctica.

Conservation of the marine environment became an early, specific concern of the consultative parties. Recommendation X-7 recognized that the presence of ice in Antarctic waters gave rise to particular shipping hazards. Later, Recommendation XV-4 prohibited all intentional plastic and hazardous waste discharges and disposal. These early regulations were closely likened to similar provisions in MARPOL, the London Dumping Convention, and the Basel Convention on Transboundary Transport of Hazardous Waste.

It is interesting to recognize that, in some cases, the consultative parties applied these conventions to the Antarctic while some of the same states had not applied similar measures in their own countries. Also, the consultative parties initially concentrated on protecting Antarctic flora and fauna. The Third Consultative Meeting in 1964 adopted the Agreed Measures for Conservation of Flora and Fauna, which initiated the move to minimize human interference with normal living conditions of mammals and birds. The Agreed Measures introduced the system of specially protected areas and sites of special scientific interest, which were adopted in 1975. Two new categories—specially reserved areas and multiple-use planning areas—were developed at the XV Consultative Meeting in Paris in 1989. All these initiatives represented a progressive sequence of environmental protective measures on specific areas in the Antarctic. Finally, when describing the Antarctic Protected Area System, the new Protocol on Environmental Protection recognizes the distinction between specially protected and specially managed areas.

Antarctica is a remote and unknown area for the general public. Tourist activities started in the mid-1960s, but noticeably increased in the late 1980s. These activities increased the knowledge and experience of Antarctica for a wide group of people.

The awareness of its vulnerability resulted in an increased public interest in Antarctica. The question arose as to whether or not the ATS could be considered the most appropriate, legitimate, and effective system to govern and protect Antarctica. In fact, the authority and legitimacy of the ATS were questioned and came under close scrutiny from some countries, especially those in the United Nations. During the annual U.N. General Assembly sessions, a number of nontreaty states challenged what they called the privileged position of the developed nations in Antarctica and questioned the legitimacy of the ATS. The intense criticism of the ATS was obviously linked to the ongoing development of a mineral regime in the Antarctic.

While the Convention on Mineral Resources was highly criticized, despite its limitations, its work represented the first decisive step in the conceptual evolution of environmental protection regimes in the Antarctic. This was completely overlooked by the critics, and the ATS consultative parties were accused of considering exploitation of the continent's presumed mineral resources. The development of the mineral convention was seen as a justification and encouragement for mineral activities in the Antarctic.

The nonparty states suggested that the Antarctic should be recognized as an area of interest to all humankind and that the U.N. General Assembly, not the treaty states, should be the appropriate governing body of Antarctica. Malaysia was the prime mover on this issue and repeatedly pointed out that becoming a party to the Antarctic Treaty implied maintaining stringent and expensive scientific qualifications, which were exclusively defined by the original treaty signatories.

Furthermore, it was pointed out that the protective regulations thus far developed under the ATS were more a gesture than a comprehensive protection system because they dealt only with the regulation of isolated environmental concerns. Objecting states called for the development of general rules, precise definitions, and procedures for the adoption and application of existing and future measures.

Furthermore, it was considered unfortunate that the ATS had concentrated exclusively on producing recommendations that depended upon national jurisdictional application and thus had not developed legally binding rules and procedures. The ATS was deemed incapable of safeguarding full and uniform compliance.

In 1988, the Chilean government was the first nation within the ATS to suggest that the consultative parties should develop a comprehensive environmental protection regime for Antarctica. In 1990, the consultative parties to the Antarctic Treaty convened the First Special Meeting in Santiago to discuss how they could improve environmental legislation in Antarctica.

The environmental debate had intensified at this point because of a series of regrettable accidents that caused damage to the sensitive Antarctic environment. Among these were the accidents of the Argentine ship *Bahia Paraiso* and the Peruvian ship *Humboldt*. These incidents, and later the accident of the *Exxon Valdez* oil tanker in Alaska, provoked justified alarm, and the public demanded better environmental protection of remote and pristine areas.

The consultative parties then started an intensive and complex round of negotiations that lasted two years. Initial drafts of comprehensive environmental regimes were jointly presented by Australia, Belgium, France, and Italy, and later the United States and New Zealand developed their own proposals. All of these drafts shared the common purposes of elaborating a

complete system of environmental protection, strengthening the existing measures, and filling the identified vacuums and, to a certain degree, initiated additional regulations. The fundamental difference between them was mainly the way in which the consultative parties looked upon the Convention on Mineral Resources and established an environmental committee with explicit authority. Some proposed complete abandonment of the mineral convention, while others, especially the United States, wanted to keep the convention and build upon it.

With regard to the idea of an environmental committee, the critical questions were whether activities in the Antarctic should be subject to previous environmental assessments, reviews, or approvals; whether there was actually a need for a new institutionalized body with decision-making authority; and whether it was appropriate to establish institutionalized inspections to monitor compliance with the provisions in the new Protocol on Environmental Protection to the Antarctic Treaty.

When the destiny of the Convention on Mineral Resources was finally solved and the question of the authority of the environmental committee was finally answered, the Protocol on Environmental Protection to the Antarctic Treaty was adopted in Madrid on 4 October 1991. It took less than two years to develop this comprehensive protective regime for Antarctica, which was a remarkable success for the ATS and which dampened criticism of the system in the U.N. In fact, the environmental nongovernmental organizations supported the ATS and considered the protocol a historic document.

THE PROTOCOL ON ENVIRONMENTAL PROTECTION TO THE ANTARCTIC TREATY

The main propose of the Protocol on Environmental Protection to the Antarctic Treaty is to supplement the Antarctic Treaty of 1959 by ensuring explicit and far-reaching protection of the Antarctic environment. The scope of scientific research was broadened and a series of juridical and institutional measures were adopted. Furthermore, it was explicitly stated that the Antarctic is a "natural reserve, devoted to peace and science," which represents the cornerstone of the comprehensive environmental regime created for the protection of the Antarctic. The idea of collective authorization was abandoned and emphasis was placed instead on the national environmental-assessment procedures.

In order to provide the possibility of control by the ATS and the general public, the consultative parties are obliged to prepare annual reports de-

scribing their activities in Antarctica. In this system, it is implied that activities incompatible with regulations of the protocol should be modified, suspended, or canceled. Furthermore, the obligations in the protocol were given greater legal precision compared to the earlier system of recommendations and leave no doubt about the compulsory character of the regulations.

Detailed obligations implementing the overall protocol goals are specified in five annexes: (1) Environmental Impact Assessment, (2) Conservation of the Antarctic Fauna and Flora, (3) Waste Disposal and Management, (4) Prevention of Marine Pollution, and (5) Protection and Management of Areas in the Antarctic.

Rules on liability/responsibility must be developed, which will further strengthen the provisions and obligations defined in the protocol. Institutional authority now remains in the consultative meetings, supplemented with recommendations of the SCAR and the Committee for Environmental Protection, which was established according to the provisions in the protocol. The increased competence of the consultative meetings has also raised the question of whether it is necessary to establish a permanent secretariat to coordinate information and technical aspects.

Mineral exploitation attracted the most attention because of the important political implications involved. It was agreed to prohibit all mineral exploitation for the next fifty years, which can be modified only if a binding legal regime on mineral resource activities is enacted.

ENVIRONMENTAL COOPERATION IN THE ARCTIC

The Arctic is no longer solely characterized as a remote, ice-covered wasteland, but is now recognized as an area of great economic potential, with rich resources of oil, fish, and gas. Considering the geographically strategic position of the Arctic with its high potential for superpower conflict, the constructive environmental cooperation that occurred there in the late 1980s was remarkable. In the early 1980s, the only environmental convention in the Arctic was the Polar Bear Convention.

While some jurisdictional questions exist in the Antarctic (because of overlapping claims and the fact that the Antarctic Treaty froze the question of national sovereignty), the Arctic is an area of virtually undisputed jurisdictional control. (The only exception is the Norwegian/Russian maritime delimitation dispute in the Barents Sea.) This is a major difference between the Arctic and Antarctica and is of crucial importance when comparing environmental regimes in polar areas.

In the late 1980s, a significant change occurred with the remarkable shift from military perspectives to a more environment-oriented approach to Arc-

tic management. Former Soviet Union President Mikhail Gorbachev's speech in Murmansk in 1987 sparked a new intensity in the bilateral and regional environmental cooperation in the Arctic. His speech signaled a determination to make a manifest distinction between military and nonmilitary issues in the Arctic. He especially mentioned five areas suitable for international cooperation, one of which was environmental cooperation. As a result, in 1988 Norway and the former Soviet Union signed a bilateral environmental cooperation treaty, followed by a new agreement with Russia in 1992. But it was the Murmansk speech that initiated concrete political actions in the environmental field. The International Arctic Science Committee was established, and, one year later, the Rovaniemi Process was initiated by the Finnish government.

The Ministerial Conference in Rovaniemi, Finland, in June 1991 was the first milestone in the Rovaniemi Process. A strategy document and ministerial declaration were adopted, which defined shared environmental objectives. The eight participating countries—the Nordic states, the United States, Canada, and Russia—expressed their commitment to developing a framework for cooperation on the protection of the Arctic.

Issues given priority in this respect were persistent organic contaminants, oil pollution, heavy metals, underwater noise, radioactivity, and acidification. Furthermore, the cooperation under the umbrella of the Rovaniemi Process included establishment of the Arctic Monitoring and Assessment Program (AMAP), an emergency preparedness, prevention, and response program, and protective measures and action plans for the Arctic's flora and fauna and marine environment.

The Second Ministerial Meeting was held in Nuuk, Greenland, in 1993, where a second ministerial declaration was adopted.

DIFFERENCES BETWEEN THE ENVIRONMENTAL REGIMES IN THE ARCTIC AND ANTARCTICA

The main differences between the legal environmental regimes in the Arctic and Antarctica are (1) obstacles for forceful legislation and compliance in Antarctica owing to lack of jurisdictional conditions and (2) complications in environmental regulation in the Arctic caused by political circumstances. Further, while the environmental regime in Antarctica is composed of detailed legal obligations, the cooperation in the Arctic is more directed towards national legislation harmonization, information exchange, and scientific methodology coordination.

The AMAP is one of the most important tools and will be decisive for all further environmental actions within the Rovaniemi Process. The primary

objective of the AMAP is to develop a program for assessing the levels and effects of anthropogenic pollutants. The monitoring will provide important data to assess these effects in distinct parts of the Arctic. Norway has provided a secretariat, based in Oslo, for the AMAP.

Radioactive pollution is an area of great concern in the Arctic and is a recognized priority in the Rovaniemi Process. Therefore, nuclear installations that may affect the Arctic must meet international nuclear and radiological safety standards established by the International Atomic Energy Agency. Furthermore, disposal of radioactive waste or material in Arctic waters must be stopped.

At the meeting in Nuuk, the Arctic state representatives decided that the AMAP should concentrate on three categories of pollutants: (1) radionuclides, (2) heavy metals, and (3) persistent organic pollutants. Coordination with the international organizations will be required in order to create a reliable and comprehensive system for identification and characterization of present and potential sources of radioactive contamination and for monitoring levels of such contamination. The representatives also decided to pursue actions in appropriate forums to obtain international recognition of the particularly sensitive character of ice-covered sea areas in the Arctic.

Chemical pollution is another area of great concern in the Arctic, especially sulfur pollution from the high concentration of industrial and mining enterprises on the Kola Peninsula and in Norilsk. While the AMAP will provide important information on these emissions, this area requires immediate action. Norway, supported by Finland, is actively negotiating with Russia to reduce air pollution from nickel production on the Kola Peninsula. These sulfur emissions have an economic dimension that certainly will require an active international cooperation with regard to finding practical and economical solutions to the problems. Norway has promised significant financial support for this project.

While there are some differences between the legal environmental regimes in the Arctic and Antarctic, legal technicalities are not a decisive factor in the protection of polar nature areas. In Antarctica, it is necessary to formally identify the legal obligations to protect the environment in an undisputed manner, but the Arctic is somewhat different. Basically, national sovereignty is undisputed in the Arctic, while the authority of the consultative parties in Antarctica is of a quite different nature. A clear signal was sent to the world when the Arctic states committed themselves to cooperate on environmental matters, and vowed that their actions will be taken based upon the ministerial conference in Finland in 1991. Unresolved judicial questions as to maritime boundaries in the Barents Sea will not

negatively affect environmental cooperation in the Arctic, while new sovereignty claims in Antarctica could jeopardize the Environmental Protocol to the Antarctic Treaty.

In Antarctica, non-judicial declarations and recommendations by the consultative parties lacked decision-making authority. Detailed rules were needed to convince the international society that the ATS was able to properly protect the Antarctic. The consultative parties completed this remarkable process in less than two years.

Therefore, in practice, it can be shown that legal formulations are not decisive for the legitimate protection of the environment. The three most important elements are: (1) all environmental regimes reflect political will and decisiveness, (2) suggested measures must focus on real environmental threats, and (3) sufficient resources must be made available.



THE ARCTIC AND ANTARCTICA: LEGAL AND POLITICAL PERSPECTIVES

Geir Ulfstein

In recent years, the polar areas have become focal points for new uses, in addition to the traditional ones. Such uses now being suggested include making the Arctic a deployment area for submarines carrying nuclear weapons, increasing shipping in the Northwest and Northeast Passages, and exploiting minerals and oil in the Arctic and Antarctic.

At the same time, there is an increasing awareness of the need for environmental protection in polar areas. The general emphasis on environmental protection is reflected in the 1992 United Nations Conference on the Environment and Development in Río de Janeiro. The polar areas are, however, extremely vulnerable to human activities, and they have been regarded as symbols of adventure and purity. The Arctic and Antarctica have, therefore, been the objects of special environmental concern.

THE LEGAL FRAMEWORK

The Arctic and Antarctica have different physical, political, and legal features. Physically, Antarctica is a continent surrounded by sea, whereas the Arctic may be described as a sea surrounded by land. Politically, Antarctica is relatively isolated, whereas the Arctic is centrally located between the United States and former Soviet Union superpowers. These factors affect management problems and the legal and political framework for management in the two regions.

Several states have territorial claims in Antarctica. These claims have, however, been “frozen” by the 1959 Antarctic Treaty, Article IV. This treaty establishes rights and duties between the treaty parties and a management framework. One of its main provisions is Article I, providing that Antarctica “shall be used for peaceful purposes only.” Article II establishes the freedom of scientific investigation and cooperation towards that end. Article IX maintains that the original contracting parties, and subsequent parties that demonstrate their “interest in Antarctica by conducting substantial scientific research there,” may adopt management measures for the region, which become effective when approved by all the contracting parties. Consequently, only a limited number of nations have the right to participate in this cooperation.

Because of the measures agreed upon under the procedures set forth in the Antarctic Treaty and its specifically negotiated conventions, Antarctica’s management has been effective despite territorial disputes. Of particular significance is the 1991 Protocol on Environmental Protection to the Antarctic Treaty, which provides in Article II that the “parties commit themselves to the comprehensive protection of the Antarctic environment and dependent and associated ecosystems and hereby designate Antarctica as a natural reserve, devoted to peace and science.” The most important means for preserving Antarctica as a natural reserve has been the adoption of a fifty-year moratorium for activities relating to mineral resource exploitation, as detailed in articles VII and XXV in the 1991 protocol.

It may thus be concluded that international management cooperation in Antarctica has been successful. However, its main weakness lies in the region’s exclusive character. Not all states can afford to undertake substantial scientific research in Antarctica, which is a requirement for participation in the decision-making. The developing states championing Antarctica as a “common heritage of humankind” thus favor global management of the region.

The appropriate legal framework in the Arctic as a polar Mediterranean, will be the Law of the Sea. Contrary to Antarctica, where management is undertaken on a multilateral basis, management in the Arctic is primarily based on coastal state jurisdiction. The new Law of the Sea creates several problems, such as boundary delimitations between continental shelves and 200-mile exclusive economic zones, the application of the 1920 Svalbard Treaty in the maritime zones around the Norwegian archipelago, and the legal regime applicable in the Northwest Passage and Northern Sea Route. But the Law of the Sea also establishes a framework for regulating user conflicts of this kind on unilateral, bilateral, regional, and global levels.

LEGAL AND POLITICAL PERSPECTIVES

The Arctic differs from Antarctica in its diverse utilization. One of the traditional uses of the Arctic has been fishing. For example, the Barents Sea has long supported one of the world's major commercial fisheries. In the mid- and late-1970s, there were peak catches of about 4 to 4.5 million annual tonnes, which was approximately 6–7 percent of the world's total marine fish catch. The catch in recent years has, however, been approximately 1 to 1.5 million annual tonnes, representing only about 1.5–2 percent of the world total. The decline in catches reflects natural fluctuations in fish stocks and overfishing.

The challenge is to design a more effective management regime for stocks in waters shared by coastal states such as Norway and Russia. But special problems such as unresolved maritime boundaries, the status of the 200-mile zone around Svalbard, and the disputed rights to the remaining area of the high seas (called *the loophole*) present difficulties in establishing an overall regime.

The Arctic became militarily significant after the Second World War. At first, the emphasis was on Arctic airspace as a potential route for attack between the superpowers. Then, in the late 1950s, ballistic missiles had been developed that could be fired across the North Pole. More recently, the Arctic has become an area for the deployment of submarines with nuclear weapons. The situation is consequently different from that in Antarctica. There is no reason to expect a demilitarization of the Arctic in the near future, but the end of the cold war offers hope of reduced tension and military activities in the region.

Oil and gas exploration and production take place in the North American Arctic, the Gulf of Alaska, and the Beaufort and Bering Seas. Barents Sea exploration has shown that gas exists in commercial quantities and indicates that the likelihood of finding oil is quite high. There has also been increased shipping in the Arctic, traversing the Northwest Passage and Northern Sea Route. Russia keeps the Northern Sea Route open for navigation over 150 days a year, and the first shipment of crude oil from the Canadian Arctic passed through the Northwest Passage in ice-reinforced tankers in 1985.

Oil exploration and exploitation and shipping are, however, undertaken at the edge of current technology and in a hostile climate in near-darkness several months of the year. The Arctic ecosystems are extremely vulnerable. There is thus a special need for strict management measures. Indeed, there is also reason to ask whether the Arctic should be protected as an area unaffected by industrialization. Reference to this is made in the Protocol on Environmental Protection in the Antarctica, which established the fifty-year

moratorium for activities relating to mineral resources. Another factor is that while the Arctic coastal states control oil exploration in the region, the International Maritime Organization primarily regulates navigation in the area.

Reason exists to assume that the new Law of the Sea regime provides a more effective system for Arctic management than the former regime. But the regime also creates new disputes about delimitation of maritime boundaries, increased shipping through the Northwest Passage and Northern Sea Route, and the maritime boundary agreement between the United States and Russia in the Bering Sea.

Temporary arrangements for these unresolved disputes need to be made, pending a final solution. For example, the 1978 Grey Zone Agreement between Norway and Russia provides a viable regime for fisheries management in the disputed area of the Barents Sea. The contested maritime zones around Svalbard are an example of a dispute that continues to create conflicts and prevent effective management. On the other hand, the fact that rights to some areas are disputed may result in an effective block against activities such as oil exploration and exploitation.

Under the new Law of the Sea, Arctic coastal states have control over resource exploitation in the 200-mile zones and on the continental shelves. Cooperation between these states is, nevertheless, essential because fish, for example, migrate between different 200-mile zones, necessitating a consistent management regime for the whole migration area. Pollutants also cross maritime boundaries.

Cooperation with non-Arctic states is also necessary. The right of free navigation inside the 200-mile zones requires cooperation with other shipping nations, and the control and reduction of military activities requires the consent of the military superpowers. Finally, fishing in the remaining high seas areas such as the loophole may also require cooperation with non-Arctic states.

Although the six Arctic coastal states (Russia, the United States, Canada, Denmark, Greenland, and Norway) should take a lead in the further management of the Arctic, it is also necessary to cooperate with non-Arctic states and nongovernmental organizations such as scientific bodies within the International Arctic Science Committee. The prospect for successful cooperation has improved with the end of the cold war.

Management in the Arctic is necessary to ensure the proper undertaking of all Arctic activities and to prevent conflicts between users. But similar to the moratorium adopted for mineral exploitation in Antarctica, there is also a need to consider whether certain activities should be prohibited in order to preserve the Arctic's pristine character.



GOVERNMENTAL STRUCTURE OF THE ARCTIC—THE RIGHTS AND DUTIES OF THE NORTHERN PEOPLES

Sigbjørn Eriksen

We in the Northern Forum believe in the ability of the people of the North to determine the course of our own history. We are not at the mercy of invisible forces. Through joint efforts and cooperation, we are determined to shape our own future.

THE NORTH

Most people in the world interpret the North as an enormous area with endless distances, darkness, cold, and frozen tundra. This is an important part of the truth. But the North also has warm summers, living and diverse cultures, an abundance of important resources, and the last pristine wilderness in the world.

My starting point for a discussion of the regional concept is the agreement from the United Nations Conference on Environment and Development. Agenda 21 has as a basic principle the concept that protection and sustainable development require new approaches to management and development at the national, subregional, regional, and global levels. From my point of view, this basic principle establishes management at a regional level for sustainable conservation and utilization of natural resources.

A region is an undefined concept which can include parts of a country, parts of neighboring countries, or neighboring countries in a part of the world. The North is a region that mainly consists of parts of neighboring

countries. These parts have one thing in common, in addition to a number of other things: They are ruled from capitals that are located far away. With regard to geography and communications, the distance poses challenges, but in terms of culture and politics, it creates tangible problems, and here we are close to the core of a common problem for the people of the North.

The distance from Oslo to Tromsø is about 1,700 kilometers. The distance from Moscow to Murmansk is 2,200 kilometers; from Washington to Point Barrow, 8,600 kilometers; from Copenhagen to Nuuk, 5,100 kilometers; and from Montréal to Inuvikit is 6,100 kilometers.

The people of the North face many important issues such as the exploitation of natural resources and government from cities situated so far away that they belong to a different world. The responsibility for resource management is administered by people who are removed from the realities and the problems in the North. Established administrative networks and communication structures eliminate some parts of the distance problem, but the question remains: What does, for example, an Inuit living at Point Barrow have in common with a citizen of Washington, D.C.?

The Economy of the North

The North is rich in natural resources. At the same time, the region is vulnerable. A long winter with low temperatures, ice-covered seas, and limited biological activity and sunlight render Arctic ecosystems particularly vulnerable to various types of pollution and slow down nature's own capacity to repair damage.

The economy of the North, ever since humans settled here, has been based on harvesting and utilizing natural resources. From the Middle Ages, trading routes from northern Norway, Europe, and Russia have been established, facilitating the exchange of products such as stock fish, walrus skin, and ivory from whale-teeth from the North for corn, spice, and clothes from the South. These trading routes formed an important linkage to overseas markets and strong connections to other cultures and nations.

Northern peoples have long used many natural resources, including fish, marine mammals (i.e., seals, walrus, and whales), and minerals. In the northeast Atlantic Ocean, the Barents Sea provides rich fishing grounds, as do the fishing grounds off Iceland. Minerals are the cornerstone of modern industrialism, and a large number of mineral resources are found in the North. The North is one of the richest regions in the world in oil and gas. The dimensions of the Prudhoe Bay and Kuparuk fields are significant in the world. The North has many large-scale hydroelectric power projects, most of which provide electricity for southern regions. Tourism in the North appears to be a fast-growing industry. "Wildlife tourism," or "explorer" tourism, is

part of the "green wave," and customers are prepared to pay large sums for seeing native wildlife. The Arctic shipping lanes (e.g., the Northeast Passage) are also increasing in importance.

A REGIONAL STRATEGY FOR THE NORTH—RIGHTS AND DUTIES

The North is rich, but the Arctic ecosystems and resources are vulnerable. The North is also vulnerable to the political and cultural distance between the decision makers in the capitals and the people living in the North.

Recently, regional institutions for handling environmental issues and resource management have been developed. From my point of view, this is an important process, and I look forward to the situation where people living in the North are able to establish or strengthen bodies across national borders in order to handle their everyday lives.

The Barents Euro-Arctic Region was conceived by the former minister of foreign affairs in Norway, Thorvald Stoltenberg. The region, most of it north of the Arctic Circle, encompasses the three northern counties in Norway, Sweden, and Finland and the two northeastern counties of Russia. Some 3.6 million people live in the region. The region was formally established in January 1993, when the ministers of foreign affairs from the Nordic countries and Russia adopted a ministerial declaration setting out the goals and structure for the initiative. The European Community also signed the declaration.

The North Atlantic Marine Mammal Commission (NAMMCO) was established at Nuuk, Greenland, in April 1992. The agreement was signed by Norway, Greenland, the Faroe Islands, and Iceland. The objective for NAMMCO is to contribute through regional consultation and cooperation, to the conservation, rational management and study of marine mammals (i.e., seals, walrus, and small-toothed whales) in the North Atlantic.

In general, the United States, Canada, Norway, and Russia have different strategies for management of the North. But the nations ruling the North have at least one common denominator: The northern regions have been, and still are, treated like colonies in relation to the politically strong regions in the South. This is not consistent with management strategies and the important principles for sustainable management given in Agenda 21.

The Regional Authority of Northern Norway has taken an initiative to discuss whether fish stocks should be managed at a regional level or, as at present, mainly as a national resource. In the 1980s, northern Norway experienced a breakdown in the capelin and cod stocks, and while fishing vessels went bankrupt, rights and quotas were also transferred from the North to the South. This situation has raised regional disagreement between north-



Many ethnic peoples of the Arctic play an increasingly important role in governance issues. Pictured here, Dolgan people. (Photo by Peter Prokosch.)

ern and southern Norway. Our goal is to establish regional management in a national framework and strengthen our fishing-dependent settlements through strengthening their right to participate in the fisheries off northern Norway.

The people in the North live in close relation to nature and natural resources, and they have a vested interest in these resources not being damaged by pollution or overexploitation. From my point of view, the best managers of the North are the people who live there and want to continue their life and culture there.

Regarding the principles in Agenda 21, it seems clear that the people of the North not only have rights to the resources, but also a duty to manage their resources in a sustainable way. The challenge to us, in the Northern Forum, is therefore to create regional bodies through which the people of the North can create their own future as equal members of a modern society. Management of the natural resources of the North must be based on a foundation of strong and solid international agreements based upon the principles given in Agenda 21 and the Law of the Sea.

Agenda 21 confirms that regional government is an important management level for all kinds of natural resources. In 1982, the Law of the Sea nationalized the most important parts of the former high seas in 200-mile zones. It is time to start a discussion about the next step in the Law of the Sea process—a regionalization of the seas in which resource management in

general devolves to the regions in a framework given by the national and international management bodies.

In this proposal, the Northern Forum should be considered a forum for informal discussion at a regional level. One important issue for such informal discussion could be the still unsolved border questions in the Barents Sea or in the Arctic Ocean as a whole. I am quite sure that an agreement in the Northern Forum could be a strong argument in favor of a solution to these problems.

The North is culturally, politically, and ecologically different from the South. It is time to think about where to establish appropriate management systems that can support and sustain this diversity.



REGIONAL COOPERATION IN THE ARCTIC AS A STRATEGY FOR MARINE MANAGEMENT

Jan Henry Olsen

Arctic marine ecosystems function as do most other ecosystems. However, because of the extreme physical conditions of light and temperature, these systems have large seasonal variation and comparatively slow response to, for example, human-made alterations. Therefore, adverse effects are active for long periods of time. Management schemes for the Arctic should therefore be more cautious, in general, than those designed for temperate areas.

The living marine resources of the Norwegian and Barents Seas are regionally distributed, and the sea animals remain within these regions all year. Some fish on spawning migrations and some whale species are exceptions.

Some Arctic marine regions are managed as distinct marine ecosystems. In the Barents Sea, for example, where some management cooperation already exists, fishery scientists cooperate with pollution scientists in assessing stock and monitoring pollution levels. However, closer cooperation and better communication with petroleum explorers and developers and the merchant marine would be advantageous for shaping a more comprehensive approach to marine management in the area.

THE BASIS FOR REGIONAL COOPERATION

Regional cooperation is certainly not a new concept for Arctic countries. In the fisheries sector, Norway has cooperated with its neighbors for several decades. Polar bears have been protected by a circumpolar treaty for twenty years, and the North Atlantic Marine Mammal Commission (NAMMCO) is

responsible for the management and conservation of small cetaceans (toothed whales) and seals. Two basic management principles are most relevant to Arctic marine systems: (1) reduction or elimination of pollution and (2) sustainable utilization of renewable resources. Nonrenewable resources represent a third class needing management, but clear and established objectives or management principles are not available.

Global agreement exists that a reduced output of pollution would benefit all life, but that the immediate cost of this reduction is a limiting factor. There are, however, many different opinions on management objectives for living marine resources. This is true even where there is a broad consensus for the optimum long-term utilization of all living marine resources, as now exists in all major legal documents, including the 1982 United Nations Law of the Sea Convention and Agenda 21 from the United Nations Commission on Environment and Development. For example, some states are devising different management strategies for marine mammals and fish.

The situation in Arctic countries is better, and consensus exists on objectives for both pollution and resource management, which has led to numerous agreements in these fields. Clearly, successful cooperation in pollution and resource management is facilitated here to some extent by a common climate, philosophy, and tradition. This is a convincing argument in favor of confining management problems to their natural boundaries and allowing those countries most affected to participate in resolving such problems.

The Arctic Environmental Protection Strategy, a component of the Rovaniemi Process, is the most recent and comprehensive work of this type in the Arctic. It clearly states its objective and principles, and it views humans as part of the ecosystem to be protected. This expresses an aspect of northern peoples' philosophy, which is embedded in their everyday interactions with nature and is more consistent with the laws of nature than is the philosophy of many urban inhabitants.

One management issue exists that has unfortunate consequences. Some nongovernmental organizations (NGOs), which generally make positive contributions to the environmental cause, fail to make the necessary distinction between pollution, resource management, and animal welfare issues. They confuse the issues, terminology, and objectives and consequently confuse the general public and many politicians. For example, the issue of humane killing is sometimes mixed with that of the sustainability of whale stocks. Such irresponsible behavior of certain NGOs redirects political focus to quasi-issues with no real environmental significance and delays important environmental work.

The International Whaling Commission (IWC) is a prime example of an organization whose work has been hampered by the activities of such organizations. As a result, the IWC now disregards advice from its scientific com-

mittee and operates in clear contravention to the 1946 Whaling Convention, which stipulates that the IWC is to provide for the conservation of whale stocks and thus make possible the orderly development of the whaling industry. The organization has, therefore, lost its integrity. Iceland and Canada have left the organization. Norway, however, is still trying to be constructive within the IWC. In a related development, the NAMMCO was established to carry out resource management and conservation based on the principles of Arctic peoples.

REGIONAL FISHERIES COOPERATION IN THE BARENTS SEA

Early fisheries organizations based on broad multilateral cooperation failed, especially in northeast and northwest Atlantic Ocean fisheries. The rapid improvements in catch technology put too much pressure on the fish stocks, and the decision-making machinery for managing fish stocks was inefficient and inadequate. Too many parties failed to agree on the necessary regulations, and scientific advice was ignored. As a result, stocks were overexploited.

The establishment of exclusive economic zones (EEZs) of 200 nautical miles in the mid-1970s gave the coastal states the necessary powers to control fishing within these zones, which contain at least 90 percent of the world's fisheries resources. However, there is often a discrepancy between the political and biological boundaries within which fish stocks occur.

The Law of the Sea Convention (albeit not yet ratified by all the countries involved) provided the basis for the Barents Sea management regime. The convention explicitly states that nations have a duty to conserve living marine resources and ensure their optimum utilization. As for the allocation of fish resources, the convention states that coastal nations are given jurisdiction over fish resources within a 200-mile EEZ. Other countries can be granted access to fish resources in the EEZ on the basis of historical catch performance, subject to the coastal state's discretion and on a reciprocal basis.

Also according to the convention, when two or more states share a fish stock—as is the case with Russia and Norway—they shall seek to work out joint management regimes. Norway and the Russian Federation have a long history of cooperation in the management of living marine resources in the Barents Sea. The objective is to achieve an optimum sustainable utilization of fisheries resources. A joint fisheries commission operates on the basis of several agreements. Cooperation is facilitated by the International Council for the Exploration of the Seas, which gives scientific advice to the joint commission.

Cooperation in management between Norway and Russia is relatively successful, even in the face of increasingly complex management problems.

One reason it functions well is that only two parties are involved in the decision making, and they have basically the same goals and objectives.

The national allocation of Norwegian quotas involves certain types of fishing vessels that are characteristic of particular regions. Norway has also recognized that the indigenous peoples of the North have special rights regarding access to local resources, and a committee is currently working to find acceptable solutions to problems in this area.

The problem of straddling fish stocks in the Barents Sea between the Norwegian and Russian Federation EEZs invites special management concern. Vessels fishing in this area exploit stocks present in both EEZs. The relevant provisions of the Law of the Sea have proven insufficient to ensure the conservation of certain stocks. Part of the solution is to develop global policies within the United Nations that can be implemented at a regional level; the other part is to find appropriate bilateral solutions. Under the U.N.'s auspices, global negotiations are taking place to establish an agreement on an international framework for the management of straddling fish stocks and high-seas fisheries.

ECONOMICS, WILDERNESS, AND ENVIRONMENTAL QUALITY

Contrary to once-popular belief, there is no contradiction between seeking to have a strong economy and wanting to safeguard wilderness and the environment. These objectives are mutually supportive. For example, during the United Nations Conference on Environment and Development, and in the subsequent preparatory process for the 1992 Río Earth Summit, it became evident that some of the countries having the greatest environmental problems with dwindling wilderness areas were also among the poorest.

The full explanation for this may be complex, but it is not difficult to understand that if people barely have money to subsist, they will not give high priority to enhancing environmental quality. In these situations, natural resources will be put under pressure for short-term profits.

This is why I support the proposed increase of development activities in the Barents Euro-Arctic Region. The development is intended to span all branches of society in parts of those four countries involved (Finland, Norway, Russia, and Sweden). If it is successful, it will benefit environmental quality and wilderness.

Regional management is an effective strategy for marine management in the Arctic. It is important not to lose faith in our ability to manage renewable natural resources. Maintaining biological diversity and catering to human nutritional needs requires that scientific methods be used as basis for management. Finally, we must pursue economic improvement for the best protection of wilderness.

Conservation Strategies



NATIONAL PARKS AND PROTECTED AREAS IN POLAR REGIONS

P. H. C. Lucas

Early interest in polar regions was based on geographical and scientific exploration in the quests for the Northwest Passage, Terra Australia, and the North and South Poles. Isolation and the inhospitable climate combined to prevent significant outside intrusion. However, these great quests for conservation are now being eroded by the rising tide of scientific and commercial activity, supported by increasingly sophisticated technology.

As population and development pressures have reduced the remaining areas of wild nature in the temperate and tropical parts of the world, the

Protected Arctic Areas

IUCN classification as of 1993

-  Scientific reserve
Strict Nature Reserve
-  National, Provincial
or Territorial Park
-  Natural Monument
Natural Landmark
-  Nature Conservation
Reserve, Managed Nature
Reserve, Wildlife Sanctuary
-  Protected Landscape
or Seascape

Southern limit of Arctic data
as provided by member countries

Arctic Circle
(Latitude: 66° 33', North)

Source data supplied by CAFF member countries:

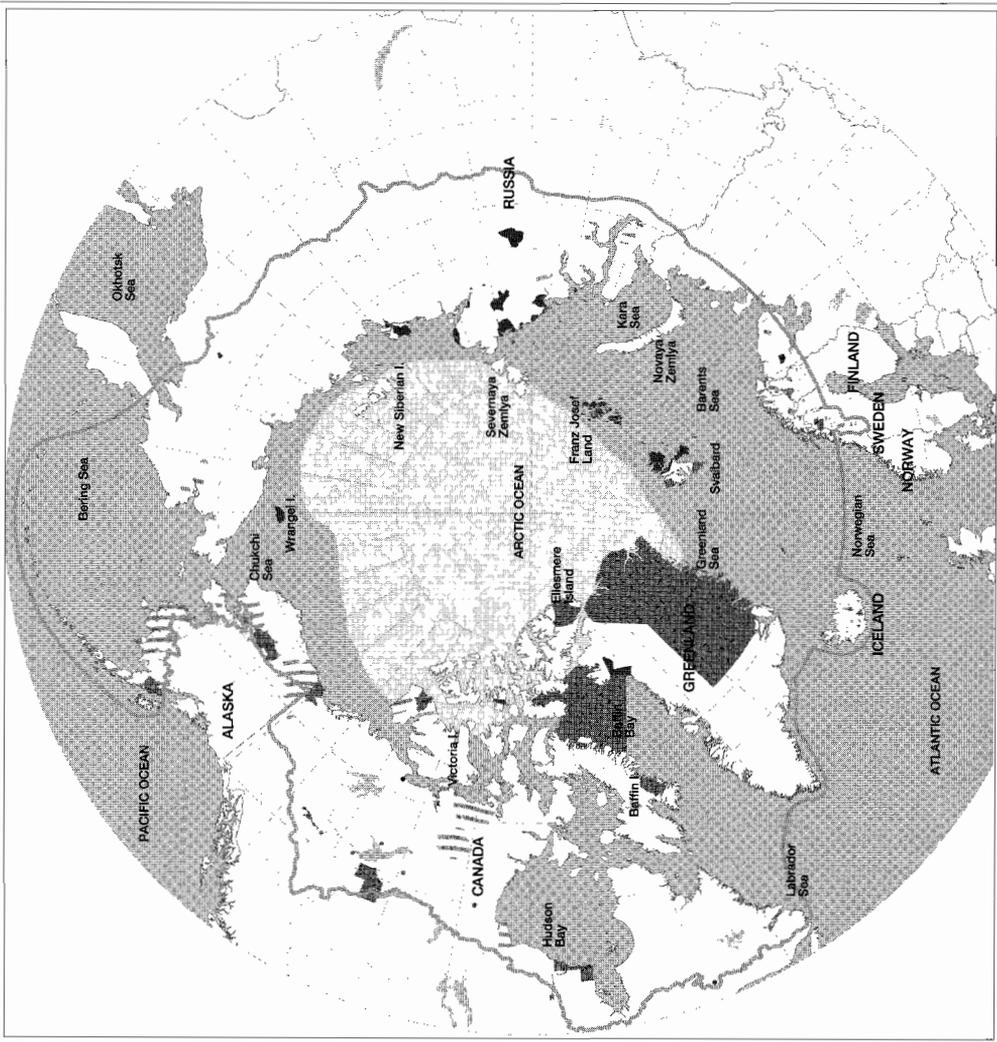


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Projection: Lambert Azimuthal Equal Area. UNEP/GRID-Arendal August 1994.



attention of those interested in wilderness has increasingly focused on polar regions. The intense debate that has taken place on the future of Antarctica over the past decade, for example, has had a strong emphasis on the region's wilderness values. The development of a minerals convention was the touchstone that brought pressure on the Antarctic Treaty nations, forcing them to bend and set aside the mining issue for at least fifty years.

Many believe that the wilderness values of these remote polar regions ought to be protected even if, for most of us, the enjoyment of those values comes from simply knowing that they are there. National parks and other protected areas are widely recognized worldwide as mechanisms to conserve nature, its biodiversity, its wilderness, and its aesthetic and other values. This is true for polar regions and other areas.

The polar regions are significantly different from each other. The heart of the South Polar region is a continent while the heart of the North Polar region is a marine environment. The North Polar region is populated by many communities while the South Polar region has only a transient population, largely scientific. The northern region has many nation-states while the southern region is regulated by an international political agreement.

This paper is an overview that builds upon more detailed coverage available in the Association of Canadian Universities for Northern Studies' 1987 publication, "Arctic Heritage: Proceedings of a Symposium," edited by J. G. Nelson, Roger Needham, and Linda Norton. The approach used in the Canadian symposium to define the extent of the polar regions is followed with a limit of latitudes to those beyond 60 degrees north and south.

THE SOUTH: ANTARCTICA AND THE SOUTHERN OCEAN

The region of the world south of latitude 60 degrees south is the Antarctic Treaty Area and is administered under the Antarctic Treaty, a remarkable international agreement under which territorial claims are set aside and management is undertaken as part of national Antarctic programs. The treaty now has twenty-six consultative parties and fifteen acceding states.

The ultimate decision-making authority is the Antarctic Treaty Consultative Meeting (ACTM) of the parties, which is about to shift to an annual meeting at which all the parties adopt recommendations by consensus, with voting by the consultative parties. The parties are advised on scientific matters by the Scientific Committee on Antarctic Research (SCAR). Recently, there has been cooperation between the SCAR and the World Conservation Union (IUCN), particularly in the fields of protected areas and tourism, designed to bring protected-area establishment and management to the Ant-

arctic. A commission under the 1980 Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) is responsible for conservation measures in managing marine areas and living resources.

The first major conservation regime was adopted by the Antarctic Treaty parties in 1964 and is known as the Agreed Measures for Conservation of Antarctic Fauna and Flora. Under this regime, the Antarctic Treaty Area is to be considered a Special Conservation Area with provision within that for specially protected areas (SPAs). Later, a further category of sites of special scientific interest (SSSIs) was added to the regime.

The SPAs are designed to protect biological phenomena with a requirement that the number of sites be kept to a minimum and be as small as possible to be consistent with the purpose for which they were designated. The SSSIs are essentially designed to protect scientific activity or sites of exceptional scientific interest that require long-term protection from harmful interference. Under these two categories, some fifty-five sites have been given protected-area status, totaling just 3,000 square kilometers. Five of them are marine with terrestrial sites conserving plant species, penguin colonies, and dry valley environments.

There has been no systematic approach to the selection of these areas; most are relatively small and generally lack management plans and effective implementation. Clearly, some of these protected areas conserve wilderness values but this was not, of course, the purpose of their designation. All are classified by the World Conservation Monitoring Center (WCMC) under IUCN's Category I.

Antarctic conservation became a substantial issue at successive IUCN general assemblies, particularly in Christchurch, New Zealand, in 1981 and Madrid, Spain, in 1984, with pressure from international nongovernmental organizations (NGOs) such as the World Wide Fund for Nature, Greenpeace, and the Antarctic and Southern Ocean Coalition. They took up a recommendation from the Second World National Parks Conference in Yellowstone/Grand Teton National Parks in 1972 calling for a World Park designation for Antarctica. The concept of retaining Antarctica as a "wilderness" free from mineral and similar exploitation became a major public issue.

The term *wilderness* appeared in treaty policy in 1989. Then, the XVth ATCM agreed on a new category of protected area to be known as a Specially Reserved Area (SRA). This was designed to extend the protection provisions of SPAs and SSSIs to include aesthetic, scenic, and wilderness features and landscapes, as well as geological, geomorphological, and glaciological features. No SRAs have yet been designated.

In 1989 the ATCM also agreed on designation of Multiple Use Planning Areas (MPAs) for Antarctica. This is a category of protected area to provide

for coordinated management that would minimize harmful environmental impacts. No MPAs have yet been designated, but two areas suggested as prime candidates are Ross Island and the Palmer Peninsula. Complementing these mechanisms are fifty-nine listed historic sites and monuments, including huts used by early polar explorers, abandoned stations, rock shelters, cairns, graves, memorial crosses, and others.

In the marine environment, seal reserves have been established under the 1972 Convention for the Conservation of Antarctic Seals. To date, three such oceanic protected areas have been established at the South Orkney Islands and at two locations in the Ross Sea. They have a combined area of 190,000 square kilometers.

Additionally, the Commission under the CCAMLR can establish protection over sites where colonies of seabirds and seals are being monitored as well as special areas for protection and scientific study. Some of these are currently under discussion.

A benchmark in the conservation of Antarctica came at the meeting of the treaty parties in Madrid in 1991. There, they adopted a Protocol on Environmental Protection to the Antarctic Treaty. This was a response to a number of influences, including the calls from NGOs for an Antarctic World Park, the decision of the treaty parties to reject a minerals convention for Antarctica, and recognition by the parties of the need for a comprehensive revision of existing conservation measures.

The protocol represents an extensive reform of protection measures that, when it takes effect, will put many of the World Park concept goals into action. Annex V of the protocol deals with area protection and management. Once it is implemented, it has the capacity to overcome the major deficiencies in the existing protected-area system. These deficiencies include the small size of most protected areas, the absence of a systematic approach to their selection, and the need for management plans and effective implementation. Among other things, the protocol provides for:

- replacing the existing multicategories with a simplified and more rational system comprising just two categories of protected area: (1) the Antarctic Specially Protected Area (ASPA), with strict protection and access by permit, and (2) the Antarctic Specially Managed Area (ASMA) to provide coordination of multiple activities and avoid mutual interference with no permits needed for entry;
- requiring approved management plans to guide management action and designate component areas for particular types of management;

- advising of the ATCMs by a Committee for Environmental Protection established under the protocol and by the SCAR; and
- disseminating and exchanging information regarding protected areas and requiring inspection to ensure protected areas are fulfilling their specified objectives.

Currently, the state governments that are consultative parties to the Antarctic Treaty are at various stages in ratifying the protocol by enacting their own legislation. It is hoped that these initiatives will proceed as quickly as possible so that the enhanced environmental measures provided for in the protocol can be implemented to produce environmental conservation over the whole of Antarctica with designation, appropriate planning, and management of areas deserving special protection. It is encouraging that the treaty parties have already decided to implement the provisions of the protocol on a voluntary basis pending formal ratification by all parties.

In the meantime, the establishment of a whale sanctuary in the Indian Ocean called for by the IUCN General Assembly and adopted by the International Whaling Commission is endorsed by IUCN. Similarly, IUCN endorses, in principle, the proposal for a further whale sanctuary in the Southern Ocean with boundaries chosen to include the full migratory range of at least one population of each species of large whale occurring within it.

In 1991, the IUCN proposed a comprehensive Conservation Strategy for Antarctica to assist the ATCMs in their management of the region. The IUCN is currently focusing on some specific issues that are of significance to protected areas—such as the impacts of tourism on the environment and on other approved human activities, especially scientific research—and has taken an important initiative to advance education about and understanding of the Antarctic environment.

The future of Antarctica is at a critical time in its modern history. The 1991 Protocol Environmental Protection to the Antarctic Treaty promises to usher in a new era in Antarctic conservation. It provides the basis for much of what the NGO movement has been advocating regarding recognition of the region's undoubted wilderness values. The task is now to encourage the governments concerned to ratify the protocol and cooperate in implementing it in a proactive way.

THE NORTH POLAR REGION

An analysis of protected areas beyond 60 degrees north requires a totally different approach compared to the South Polar region. In the North

Polar region there are sovereign states, protected areas established under national legislation, and often indigenous communities dependent on the local resources.

The data base held by the WCMC as of August 1993 showed 427 protected areas qualifying for IUCN's Categories I to V, that is, those including strict nature reserve and wilderness areas, national parks, natural monuments, habitat/species management areas, and protected landscapes/seascapes. These have a total area of 2,080,560 square kilometers, representing some 5 percent of the total land area. This is about half the target area generally accepted as being globally desirable, including that which was set forth in the Brundtland Commission's report, "Our Common Future."

By far the largest of these protected areas is Greenland National Park with 972,000 square kilometers. The United States has sixty-eight protected areas qualifying for IUCN Categories I to V in Alaska, totaling 698,270 square kilometers, with most of them classified as habitat/species management areas. Canada has twenty-nine areas north of 60 degrees, totaling 242,800 square kilometers. Many of these have a categorization similar to the Alaskan sites, recognizing some management and harvest of species by the indigenous residents of these areas. Other countries with significant Arctic protected areas are Russia, Norway (including Svalbard), Sweden, Finland, and Iceland.

Nations establishing protected areas in the Arctic use all five of the IUCN categories of protected areas, recognizing the varying management objectives for these areas. Wilderness as a legal status applies in only a relatively few cases, but clearly, many of the areas have strong wilderness values; although, in terms of use, the value is negated in those cases where entry is restricted by law.

A significant feature of some protected areas is recognition of sustainable-resource use by indigenous communities: a break from the Yellowstone concept, but a necessary one for the Arctic. There remains considerable potential to develop consultative and cooperative mechanisms for management systems that not only recognize the legitimate needs of indigenous communities but involve them in decision making and management.

Coverage of protected areas by biome in the northern circumpolar region shows good representation in percentage terms of tundra communities, subpolar deciduous thickets, and temperate rainforests or woodlands, but inadequate coverage of temperate needle-leaved forests and lake systems. These are only broad assessments, and closer study is needed to determine the extent to which the various biomes have adequate protection, assuring protection of representative ecosystems.

The predominant emphasis has been on protected terrestrial areas, but there are several examples of protected areas in the marine environment.

For example, Canada's Ellesmere Island National Park includes a significant marine component while the Alaskan Maritime National Wildlife Refuge in the United States includes a Chukchi Sea Unit. The Directorate for Nature Management in Norway and the Arctic Working Group, which is part of a global project led by the vice chair (marine) for IUCN Commission on National Parks and Protected Areas, Graeme Kelleher of Australia's Great Barrier Reef Marine Park Authority, are currently working together to establish a greater focus on the potential for marine protected areas.

Internationally, there have been some positive cooperative efforts in establishing transboundary protected areas between Norway, Sweden, and Finland and the United States and Canada. Unfortunately, good progress being made between the United States and the former Soviet Union in establishing a Beringia International Park has stalled due to the end of the cold war. The proposal was an unprecedented achievement for any protected area/wilderness proposal because it was the subject of two presidential summit agreements between the United States and the Soviet Union. It is ironic that the liberalizing trends that laid the foundation for joint protection of the shared heritage between the two superpowers have now stalled the project. Current political uncertainties with Russia, decentralization of authority, and new demands for autonomy have made it nearly impossible for the two countries to proceed at this time. It is hoped that the future will allow this innovative and exciting project to be revived and revitalized. The concept of Beringia International Park is an idea that symbolizes the bridges that wilderness and heritage values can build between people everywhere.

There is, however, some good news. Russia has announced a major new protected area on the Taymyr Peninsula in northern Siberia. Known as the Great Arctic Zapovednik, it gives protection to 41,000 square kilometers.

The World Heritage Convention has been used sparingly by countries with territory in the North Polar region but, where it has been used, it has brought significant conservation benefit. Most countries of the region are parties to the convention, but only Canada and the United States have made successful nominations to have areas listed under the natural wing of the convention. These countries have worked for the combined listing of Canada's Kluane National Park and the Wrangell-St. Elias area in Alaska. In 1992, protected areas in Glacier Bay, Alaska, were added to this site with the World Heritage Committee urging protection of a linking area in British Columbia. Subsequently, the B.C. provincial government announced a decision to give protected-area status to this link in the Tatshenshini-Alsek region and propose it as an addition to the existing World Heritage site.

So much for the statistical scene. But what of the feel of the circumpolar region, its protected areas, and the context in which they exist?

A New Zealand adventurer and colleague, Graeme Dingle, recently completed a 28,000-kilometer journey around the Arctic that began and ended at the eastern extremity of Siberia. Dingle said of his travels:

Like many people, I have become quite besotted by the wonders of the North. The fantastic extremes of winter and summer, of dark and light, of fecundity and sterility, and of human warmth and hospitality. Most of us acknowledge the importance of polar regions to the health of the world but sadly all is not well in the Arctic. Much of the Arctic's wildlife is struggling to survive; waters are polluted and overfished; and there are communication difficulties between the indigenous peoples and the controlling authorities, to mention but a few of the problems.

Like others who know and love the Arctic, Dingle is concerned that more be done to conserve its natural and wilderness values in a manner sensitive to the needs and wishes of the indigenous peoples of the Arctic.

While the situation of protected areas in polar regions gives some cause for encouragement, it simultaneously gives no cause for complacency. It is vital for the future environmental health of the North and South Polar regions, and of the world, that we encourage our governments to cooperate in the common cause of enhancing the number and management of protected areas.

ACKNOWLEDGMENTS

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ARCTIC CONSERVATION STRATEGIES

Jens Wahlstedt

Even though Arctic conservation progress has been slow, particularly considering the urgency of effective action to counteract the growing threats to the Arctic, one could note with satisfaction that inter-governmental cooperation has made substantial progress on some issues. The World Wide Fund for Nature (WWF) strongly believes that a comprehensive international conservation program for the Arctic must be adopted and implemented as a matter of highest priority, if the special values of the Arctic environment are to be protected from the increasing and serious threats facing the area.

Hence, the WWF welcomed the intergovernmental cooperation of the Rovaniemi Process, initiated in 1989 by the Finnish government. The Arctic Environment Strategy, adopted by the ministers from all the Arctic countries in 1991, was an important first step towards a comprehensive protection plan for the Arctic.

However, I also agree with the ministers from the United States and Canada when they expressed some disappointment during the Second Ministerial Meeting that the progress has been too slow, and so far there has been more talk than action. Arctic governments seem reluctant to get too involved and make any extensive obligations to the Arctic environment. Furthermore, the money is not available to make any substantial progress. This latter case is even more deplorable, considering that the military investment in the Arctic is enough to kill us all at least fourteen times over. However, since 1991, the Rovaniemi Process worked and cooperated on the following important areas:

- Arctic Monitoring Environment Program;
- Emergency Preparation and Preparedness;
- Conservation of Arctic Flora and Fauna (CAFF); and
- indigenous peoples and NGO involvement.

From the WWF viewpoint, the request of the ministers to the Working Group on Fauna and Flora to prepare a plan for developing a network of Arctic protected areas was particularly welcomed, as was the establishment of an interim secretariat for CAFF to be funded by Canada.

A considerable predominance of protected areas exists in the Western Hemisphere, and a similar need for protected areas exists in Siberian Europe. The WWF has been active in this field and has worked with the Russian experts on the Taymyr Peninsula for three to four years to establish new protected areas. As a result, the Great Arctic Reserve was inaugurated last summer, covering about 40,000 square kilometers (equivalent to the size of Denmark). The WWF will jointly proceed with the Russian and regional governments and scientists further eastward in Siberia. The WWF plans to support a new research station in the Lena Delta and the development of new protected areas in both terrestrial and marine environments.

New observers from Arctic indigenous organizations with a profound interest in the Arctic and a readiness to contribute to its environment will soon be accredited and able to officially participate in the Rovaniemi Process. The WWF welcomes these additions and the decision to involve indigenous peoples in the process. However, some major gaps in the Rovaniemi Process exist, and the inter-governmental cooperation for the Arctic environment consequently needs:

- a convention on Arctic environmental protection (especially flora and fauna);
- a general secretariat or Arctic council to pursue and supervise the convention; and
- management of marine living resources.

The proposal of a convention for the Arctic environment was raised by WWF at the Rovaniemi meeting in 1991 to create legally binding instruments. The WWF also suggested that a secretariat be established to ensure supervision of the regulations and agreements. This has also been suggested by the United States and Canada.

So far, the proposed convention has been carefully avoided in the Rovaniemi Process. The reasons given suggest that the procedure to

establish an overall convention might slow down the whole process, and that the present conventions would cover Arctic needs.

The WWF strongly disagrees with both of these statements. Other global processes have shown that without a strict convention with a specific purpose, important areas and issues will fail to receive the necessary attention and action.

For example, this is the case for Arctic marine living resources. The WWF is disappointed that nothing has been discussed about these resources during the Rovaniemi Process. The whole topic seems to be too politically and economically sensitive. Still, many Arctic peoples are directly dependent on the management of fish and mammal resources. As the United States and Iceland have declared, there is an urgent need to include marine living resources in the Rovaniemi Process.

The WWF suggests revising the strategy adopted by the First Ministerial Meeting or negotiating a new one to protect the fragile Arctic environment and assess the progress made so far within the inter-governmental Rovaniemi Process. The basic objective in any such new strategy should be ecological, sustainable development of the Arctic based on the conservation of intact ecosystems and processes in the terrestrial, limnetic, and marine environments. A cornerstone in the strategy should be an international convention on the conservation and sustainable development of the Arctic.

The WWF suggests that the convention should highlight the general objectives and obligations of the contracting parties. The following three basic principles should be embodied in the convention: (1) precautionary, (2) polluters pay, and (3) users pay.

The convention should also formally recognize the competence, rights, and obligations of Arctic indigenous peoples. We can learn a lot from their experience in the sustainable management of Arctic resources. The full participation of indigenous groups in the convention is, therefore, a necessity if the convention is to fulfill its main objectives.

However, all interested parties should be allowed to participate and contribute to the work within the convention. Hence, the convention should also provide for transparency and access to information for all those who are interested in Arctic environmental issues.

One important tool in this respect could be an open and comprehensive system for mandatory environment impact assessments (EIAs) of all planned activities that could harm the Arctic environment or human health. These EIAs should be carried out early in the planning process to allow for a full-fledged assessment of alternatives, including a zero alternative (i.e., not issuing a permit to a project or activity).

The convention should also require the establishment of an Arctic international secretariat, funded by the contracting parties. Such a secretariat is essential in order to provide continuity in the work and avoid dependency on a single country for funding certain activities within the convention.

In the spring of 1993, the WWF circulated a first draft of a Protocol on the Protection of Arctic Flora, Fauna, and Protected Areas in order to illustrate how such a protocol could be structured and how it could function. The WWF has already received a number of positive comments and suggestions on how to improve the draft text and intends to continue working and lobbying for such a protocol to be included in the next ministerial meeting in 1995.

There is still a lot to be learned about the Arctic environment, its ecosystems and their interrelationships, Arctic species interactions, and the environment's vulnerability to human interference. Hence, there is also a strong need to strengthen the research cooperation between those countries and organizations that support various scientific programs in the Arctic. As mentioned before, the WWF is active in this field with a number of projects in all the Arctic countries. The WWF hopes to expand these activities into new areas and issues in the future.

The WWF is concerned about future work in the Rovaniemi Process, especially about obtaining an alternative—more open and effective—Arctic conservation strategy. Towards this end, the WWF suggests the need for a convention on the protection and sustainable development of the Arctic, which is internationally legally binding, and the establishment of an Arctic international secretariat to pursue and supervise the implementations of the convention.



A PROTECTED-AREA SYSTEM FOR THE ARCTIC

Peter Prokosch

Protected areas can be viewed as touchstones from which to evaluate the success of those concrete measures that can ultimately achieve the safeguarding of wilderness. This is particularly true of the circumpolar framework of protected areas in the Arctic and what should be done in the future to obtain a more complete system.

PRECONDITIONS

With regard to various attempts around the world to systematically protect wild areas and integrate these efforts with other international environmental-cooperation objectives, the following conditions for achieving such goals are better and much less complicated in the Arctic than in most other global regions:

- Apart from Antarctica, the Arctic represents the world's largest wilderness region, particularly when considering vegetated ground that is not permanently covered with snow or ice.
- Arctic ecosystems are less complex than most other ecosystems in the world.
- The habitats, biodiversity, and even species are similar in all the Arctic regions/countries around the North Pole.
- Common circumpolar management strategies are favored due

to the fact that human interests and activities are similar in the polar regions.

- Apart from Antarctica, there is no other region of similar size in the world where pressure from human population growth and economic development is less dominant than in the Arctic. Some areas, subsidized by southern economies, even have difficulty maintaining the current population level (e.g., settlements in Svalbard and towns in northern Siberia).
- There is worldwide understanding and support for the protection of Arctic indigenous peoples and cultures. First nations should have the first right to use the natural resources for their own subsistence, and there is an increasing commitment for sustainable use of these resources.
- The eight Arctic nations, together with the main organizations of the indigenous peoples of the Arctic, have been promoting an Arctic Environmental Protection Strategy (AEPS) since 1991. This includes protection of habitats. Norway has just produced a new draft of a comprehensive report on Arctic habitat protection, which gives a circumpolar overview of the existing protected areas and the criteria needed to close identified gaps. Recently, at the Second Ministerial Meeting in Nuuk, Greenland, the Arctic countries reconfirmed their commitment to Arctic environmental protection. They also supported the Conservation of Arctic Fauna and Flora (CAFF) working group's plan to produce an Arctic Protected-Area System.

Potential for environmental protection exists in the Arctic to serve as a prototype for other (more complicated) international plans for protected area systems. (See, e.g., the drafted Action Plan for Protected Areas in Europe of the World Conservation Union.) Theoretically, the foundation for designing an Arctic protected-area system has been laid, and governmental engagements seem promising.

GENERAL FRAMEWORK

From a global point of view, the most important framework for environmental protection was formed from lessons learned during the Río Earth Summit in June 1992. Nowhere else has a broader consensus been achieved on the need to integrate conservation and development in order to meet the massive human and ecological challenges worldwide. The need for global

partnership in sustainable development was described at the summit. Therefore, applying the principles of the Río Declaration, fulfilling the requirements of Agenda 21, and meeting the obligations of the treaties signed in Río by the Arctic nations should be the first tasks to undertake.

The Convention on Biological Diversity must also be implemented in the Arctic. Formally, the process of ratification has yet to be completed. To achieve the convention's main objective—the conservation of biodiversity—the nations were asked to “establish a system of protected areas or areas where special measures are taken in order to conserve biological diversity.” The convention gives high priority to the protection of whole ecosystems and habitats.

Another valuable framework that supplies us with the background information, reasons, and criteria for designing a protected-area system are the findings of the IVth World Congress on National Parks and Protected Areas, held in Caracas in 1992. The following purposes of protected areas were established at the congress:

1. to safeguard the world's outstanding areas of living richness, natural beauty, and cultural significance as sources of inspiration and irreplaceable assets;
2. to maintain the life-supporting diversity of species, genetic varieties, ecosystems, and ecological processes;
3. to protect genetic variation and species that are needed to meet human needs (e.g., food and medicine);
4. to provide homes to human communities with traditional cultures and knowledge of nature;
5. to protect landscapes reflecting a history of human interaction with the environment;
6. to provide for scientific, educational, recreational, and spiritual needs for societies; and
7. to provide benefits to local and national economies and models for sustainable development to be applied elsewhere.

These worldwide purposes address the various aspects of concern for Arctic protection. How to link protected areas to sustainable development has also been addressed in the papers from Caracas. Furthermore, these papers confirm the different types of protected areas, categorized according to their management objectives.

The Arctic Environmental Protection Strategy

In the process of fulfilling the AEPS the eight Arctic countries established the CAFF working group. The Norwegian Directorate for Nature Man-

agement for this group recently produced a second draft of the report, "The State of Habitat Protection in the Arctic." This report gives the most comprehensive and up-to-date information on Arctic protected areas, although it is meant to be even more complete when it is published. It will also be an important source of information when the CAFF, following Russia's lead, produces international guidelines for an Arctic Protected-Area System. The guidelines will hopefully give criteria for setting up new reserves and completing the existing network.

Existing guidelines for an Arctic Protected-Area System result in scattered and uneven distribution of protected areas in the Arctic. These are categorized by the World Conservation Union (IUCN) definitions. About 13.4 percent of the land area (1,778,257 square kilometers) in the Arctic has been given protected status. More than half of it is situated in Greenland. Marine protected areas hardly exist at all. The largest countries, Canada and Russia, encompass more than 75 percent of the terrestrial grounds in the Arctic, but they have by far the least amount of protected area. Canada protects only 4.2 percent of its Arctic grounds, and Russia protects even less, only 3.4 percent. However, Russia recently succeeded in doubling its strictly protected areas by setting up the 4.2-million-hectare Great Arctic Reserve on the Taymyr Peninsula.

Because there has never been circumpolar cooperation on protected areas in the past, each nation has developed its own quality standards on reserves, which are often difficult to compare. For example, the strict protection given to an area such as a Russian *zapovednik* does not exist anywhere else in the Arctic. On the other hand, the United States designed a highly diverse protected-area system covering more than 50 percent of Alaska, which is the most significant amount of Arctic land protected within a single country.

The Norwegian report further found that area protection even within countries is not systematic with regard to representation of different physical geographical regions. Perhaps the most advanced plans are underway in Canada to protect new areas in order to increase the representative coverage of different eco-zones.

HOW CAN A MORE CONSISTENT PAN-ARCTIC SYSTEM OF PROTECTED AREAS BE REACHED?

First, an important step for the Arctic countries would certainly be to evaluate the advantages of the various protected-area strategies of different nations and commonly adapt and, if possible, implement the most

effective and practicable components throughout the Arctic. That could mean, for example:

- The introduction of a Russian-type zapovednik to other countries in order to set aside ecological standard zones where the most pristine ecosystems could be conserved and studied. Certainly, mainland Norway deserves this type of reserve because few totally unused nature reserves or national parks exist there.
- The protection system in Alaska could be used as a model for attaining better coverage of protected areas in the Arctic. As one of the most economically and technologically developed countries in the world, the United States has shown that it is possible to protect 58 percent of all its Arctic lands under different protection categories. Including more than half of the Arctic into different types of protected areas is, therefore, not an unrealistic goal.
- The adaptation of the positive components of nature preservation in Canada and Greenland could be used to integrate sustainable use of resources by indigenous and local peoples with habitat protection goals. Among several possibilities, it may be wisest to promote a more widespread implementation of the biosphere reserve strategy, which combines the protection of natural and cultural values, for the Arctic region.

Second, the introduction of large-scale protected marine areas is an important obligation of the Arctic countries. Among several proposals, special protection of the so-called Arctic Ring of Life was suggested by the U.S. Arctic Network. This covers the highly productive marine-shelf regions and is the most convincing proposal.

The proposal by Norwegian nongovernmental organizations for an international park in the Barents Sea is a concrete opportunity for Norway and Russia to set the first example of a transboundary protected marine area. These marine areas would require the introduction of special Arctic marine-management regulations in order to safeguard the long-term sustainability of marine living resources. A consensus must be reached on precautionary measures that exclude activities causing pollution, destruction, or other threats to the environment.

Third, the most sophisticated and far-reaching means of achieving a more consistent pan-Arctic system of protected areas are attempts at overall Arctic landscape planning. Ideally, this would mean integrating the protec-



*Polygon tundra, a natural landscape feature of the Taymyr Peninsula.
(Photo by Peter Prokosch.)*

tion of representative eco-zones, with all aspects and demands of Arctic societies reaching a common, international understanding and agreement about which areas and resources to use and to what degree. This would require significant foresight about future Arctic developments.

Such planning could begin with a practical approach; for example, through asking Arctic residents and organizations to map geographical zones according to their different interests. Such maps could be used with concrete proposals by local people on how to use living resources in a sustainable manner and where to leave nature untouched to form an appropriate basis for decisions concerning protected areas with different management goals. In principle, there is a sufficient number of IUCN categories of area protection to be able to provide more than 90 percent of Arctic land with some form of protection status.

However, how much time and planning resources do we have? Realistically, progress can only be made through a combination of systematic planning approaches and concrete efforts to seize opportunities. That conservationists and local people work together on regional projects is certainly as important as the circumpolar cooperation of the eight Arctic nations. Opportunities exist to produce a pan-Arctic picture of stages of protection, compare different strategies and ways of thinking, and learn from each other in creating protected areas.

The World Wide Fund for Nature has decided, for example, to concentrate its present international Arctic conservation activities on Russia. There is a practical reason for this: Russia has the largest Arctic zone, but the least amount of protected areas. There is also an opportunistic reason: Russia's political changes could result in an escalation of threats to the environment while simultaneously opening a door for international cooperation in nature protection.

Some of the most impressive Arctic wilderness treasures are located in Russia. For example, the Lena Delta polygons, formed by systematic and accidental forces, serve as a natural model for the development of an Arctic protected-area system. These systematic formations clearly illustrate that wilderness is not solely chaotic. In fact, wilderness can be simultaneously chaotic and systematic.



FINLAND'S WILDERNESS ACT— A SCANDINAVIAN MODEL

Sirpa Pietikäinen

A well-used saying is that “Finland lives by its forests.” In fact, rational exploitation of our forest growth has always been the backbone of the economy. Especially from the 1950s on, mechanized and highly effective forest management rapidly reduced the roadless forest area still in its natural state. We were accelerating into a situation where not even the most distant lump of trees was safe from multiprocess machinery advancing along newly built forest roads.

In the 1980s, as logging operations were approaching the last major forests in their natural state, not only conservationists were concerned, but there was widespread recognition of the importance of wilderness areas as a valuable natural resource. There was a vociferous demand for wilderness preservation, and wilderness activists played an important role in speeding up administrative procedures and publicizing the problem.

At this time, Finland also initiated environmental protection measures in the Arctic. In 1991, the eight Arctic ministers of environment approved the Arctic Environmental Protection Strategy (AEPS). The theme of this document endeavors to preserve Finnish wilderness areas.

In 1987, the Finnish government set up a wilderness committee to propose how the remaining valuable wilderness areas could be preserved. As a result, in 1991 the Finnish Parliament passed the Act on Wilderness Reserves, under which twelve special wilderness areas were established in northern Finland, totaling almost 1.5 million hectares. These areas are not



*Muotkatuuturit, designated wilderness in Lapland (North Finland).
(Photo by Tapio Tynys.)*

expressly nature reserves, although in practice they contribute much to nature preservation.

Wilderness areas in Lapland are quite varied. They hold the most extensive mountains and the most important timberline forests, as well as a variety of bogs, marshes, and water-courses. The proportion of well-grown forests in Lapland's total wilderness area is modest, with only some 170,000 hectares. Yet, even this is two-thirds of the forested area in Lappish nature reserves.

Even before the open-wilderness conflict, a number of nature reserves had been established by law, particularly in Lapland. It goes without saying that many of these have important wilderness values too, being fairly extensive and relatively untouched. The new wilderness areas supplement these nature reserves and together include over 2 million hectares, which is almost one-quarter of Lapland's total land area.

However, not even the present network of conservation areas is sufficient to achieve the goals set for nature protection in Finland, and several plans still need to be implemented. The National Board of Forestry has initiated

an inventory of valuable natural areas on state land, which will presumably result in new wild areas being protected during the next few years.

The Finnish wilderness areas also contribute to the continuation of indigenous Sami culture. The Finnish Sami areas, covering the northernmost regions of the country, also hold the bulk of the wilderness areas, in addition to major nature reserves. Eighty-five percent of the Sami homeland and 40 percent of its forest land are now exempt from forestry.

All wilderness areas have a great significance for the indigenous means of livelihood in the Sami area: reindeer herding, fishing, and hunting. Although land ownership is still being discussed between the Sami peoples and the Finnish government, this by no means reduces the importance of land preservation.

The Finnish Act on Wilderness Reserves was enacted in order to make it possible to regulate, guide, and coordinate the use of wilderness areas for indigenous livelihoods, forestry, and recreational purposes. Under the act, procedures affecting wilderness areas are more flexible than if this network of areas had been made into nature reserves. The main aim is to preserve nature in its original state and safeguard traditional livelihoods in the Far North. The Act on Wilderness Reserves involves few restrictions in the present use of these areas, except in cases where major changes in natural conditions or



An old open cottage near Hammas tuuntun (designated area), North Finland (Lapland). (Photo by Tapio Tynys.)

landscapes are being considered. It is now forbidden to build roads, embark upon mining operations, or establish extensive centers for tourism in the wilderness reserves.

In order to safeguard wood resources for local purposes, the Act on Wilderness Reserves provides for careful utilization in four wilderness areas. This extraction use will be further detailed in the plans for management and use of each area. Naturally, even this conditional permission to exploit forest wilderness has met with opposition. The Finnish Ministry of the Environment is closely monitoring all plans for use of the wilderness areas and will have the final say about logging operations. Even at this stage, logging plans have been restricted. The most valuable areas will be exempt from forest management, including the extensive Vätsäri Wilderness to the east of Lake Inarinjärvi.

Other problems are connected with the protection of wilderness areas. Off-road terrain-vehicle use causes serious wear and tear, erosion, and general disturbance. Snowmobiles used for reindeer-herding purposes are now so common that, in some cases, management of impacts is impossible. The Finnish Off-Road Traffic Act is currently being revised so that the authorities can supervise such traffic more easily. The National Board of Forestry strives to restrict the use of terrain vehicles as much as possible and establish specific routes for such use.

Traditional wilderness activities include hunting and fishing, and the Act on Wilderness Reserves applied no stricter legislation than those already enacted. Hunting in the wilderness is an age-old occupation in Finland. The Finnish concept of wilderness used to refer to specific, more or less delimited, hunting areas outside settlements. In Sami culture, *wilderness* has always had two meanings: (1) "a source of livelihood" and (2) "home."

Tourism, if allowed to expand freely, also threatens the wilderness character in Finland. This is why visitors are advised to stay on established routes. And, in reality, no mass tourism is possible given the local conditions. Present services to visitors and tourists are generally adequate, but increased tourist demands would render them inadequate.

Additionally, pollution from neighbor countries affects Finnish wilderness areas. We need continued and concerted international cooperation to reduce transboundary airborne and waterborne pollution and enhance nature conservation. It is regrettable that we still must wait for major steps to be taken to curb sulphur emissions from the nickel industry on the adjacent Kola Peninsula in Russia.

Yet, there are several favorable outlooks for the future. Norway, Finland, and Russia are planning a common protected zone in the Lake Inarinjärvi-



Finnish Wildlife Reserves

Pasvik area. In Finland, the Vätsäri Wilderness provides a kernel for the project. Finland and Russia have also cooperated in setting aside extensive protected-wilderness reserves astride their common border in order to preserve the taiga zone forest in eastern Fennoscandia.

On the whole, the Finnish Act on Wilderness Reserves has created a firm ground for protecting various habitats, providing multiple use of wilderness areas, and changing administrative trends. For instance, the Finnish principles of multiple forest use, which were developed for the wilderness reserves, are rapidly permeating the administration of other areas. Thus, Arctic conservation measures developed in Finnish Lapland during the last few years are partially due to this influence.

Exploitation and Sustainability in the North



SUSTAINABLE LIVING IN THE ARCTIC

Walter Hickel

From my perspective, and the perspective of most Alaskans, the human element is often ignored by the advocates of wilderness preservation. To many in the temperate zones who are “down there, looking up,” the Far North appears hostile to human life—cold, remote, and as mysterious as the moon. This image makes the Arctic romantic for some and fraught with fear for others.

But those of us who live here look at the Arctic differently. We don’t look down. We don’t look up. We look around. To us, the Arctic is home.

The Arctic is heritage. The Arctic is our here and now and our hereafter. We love it—summer *and* winter.

Dressed in a parka and snowshoes, I often stand on the trail near my home on Cook Inlet on a dark night and look to the north at the dancing aurora. Sometimes these colorful bands of light look like searchlights sweeping the sky in search of God. Sometimes they appear to be shimmering curtains pulled across the sky by a mysterious hand: a magic show on display. Yes, we love our North Country with all its wonders.

THE NORTHERN FORUM

The Northern Forum is comprised of fourteen elected leaders from the Arctic. The forum's common purpose and responsibility is to help guide our Arctic peoples along the full gamut of sustainable living. To understand *sustainable living* in the Arctic, you must have *sustained thinking* in the Arctic. You have to *live* it, over time.

In 1940, I stepped off a steamer onto Alaskan shores as a young man with just a few cents in my pocket. I liked the feel of Alaska. I knew I had come home. Now, half a century later, I am proud of our accomplishments, both environmental and economic. We have pioneered in both areas.

Alaska's Wilderness and Environmental Leadership

Alaska has more acreage in legally designated wilderness than the other forty-nine states combined, more, I venture to say, than most Alaskans would like. In addition to 23,481,781 hectares of federally owned wilderness, in which no human habitation can be built and no resource development can take place, we have another 45,748,988 hectares in which mineral entry is forbidden or so complex it is uneconomic to pursue. That total of 69,230,769 hectares is just over twice the size of Norway. Then, we have another 4,655,871 hectares of state-owned parks and reserves—that's 404,858 hectares larger than Denmark.

But sustainable living requires more than preservation. It also requires stewardship.

After reassuming the governorship of Alaska in 1990, I set out to put the tragic 1989 *Exxon Valdez* oil spill behind us. Enlisting the support of our federal government, I negotiated a global legal settlement with Exxon Corporation for U.S.\$1 billion. Since then, we have begun to use that money to turn Prince William Sound into a living laboratory to study the long-term impact of oil in our waters, and we have dedicated some of the settlement funds to enhance the affected areas and to purchase important habitat.

In fact, Alaska celebrated the U.S.\$22-million purchase of private inholdings in Kachemak Bay State Park, our oldest and one of our most beautiful state parks. Other portions of that settlement money will enhance our knowledge of northern ecosystems. For instance, we will build a marine research and education center on the scale of the Wood's Hole facility in Massachusetts. It will be located, appropriately, on Resurrection Bay.

Resurrection is the right word to use here, and let me confirm that Prince William Sound is rapidly recovering, mostly due to the remarkable capacity of Mother Nature to heal herself. It's hard to describe the beauty of this area with its incredible combination of fjords, alp-like mountains, and glaciers. The mountain peaks are jagged, yet they carry over one hundred glaciers on their broad shoulders, some so high they give the impression that rivers of ice are hanging in the sky.

Alaska's Achievements in Development

In Alaska, we are as proud of our development accomplishments as we are of our environmental victories. The Arctic will never be heavily populated. But the Arctic is rich in the resources people need. Alaska produces 25 percent of the oil used in the United States and many other products. On the North Slope, nature condensed a continent of food into an ocean of oil. With my enthusiastic prompting, that oil was discovered during my first term as governor, and I played a role in ensuring that the trans-Alaska oil pipeline was built and built safely.

Our North Slope oil development is the finest anywhere in the world, and we are getting better at Arctic engineering every year. With state oversight, industry has shrunk the size of the drilling "footprint" to one-quarter of what it was when we began twenty years ago. Computer-designed directional drilling has transformed onshore drilling. Up to twenty wells are spudded from a two-hectare pad. These wells, in addition to being drilled into the earth, can be horizontally drilled with a reach of up to 4.8 kilometers. And the drill cuttings and spuds are now being reinjected deep into the earth so that no waste products are left on the surface. I urge you all to visit and to examine these pioneering marvels.

TEN LESSONS LEARNED FROM SUSTAINABLE LIVING IN THE ARCTIC

LESSON 1. IT IS A COLLECTIVE WORLD.

As the indigenous peoples learned long ago, in a cold, harsh environment, one has to care about others. You waste nothing. You share to survive. You care for the whole. Every hunter's prize is a gift, not just to

that hunter but to his family and village. Sustainable living requires collective concern.

Throughout the world, a new understanding of our environment has awakened this same sense of shared responsibility. Pollution knows no borders. All rivers eventually run into a common sea. All living things breathe the same air. A few days a year, a smoggy haze can be seen near the top of Alaska's Mount McKinley. Scientists have traced that hazy pollution to its origins in industrial Asia and Eastern Europe.

Yes, it is a collective world, but one in which we live so privately. Without concern for other people, for their needs and desires, activities for strictly private gain become destructive, not only to others but eventually to those private interests. These truths were learned early in the history of northern civilizations.

LESSON 2. CHANGE IS A NATURAL LAW; WELCOME IT.

In the Far North, nothing changes the environment as much as nature. Signs of the planet's vitality and youth are seen in our volcanoes, earthquakes, and rivers, most of which don't run blue. They run rich with the colors of a changing earth.

In the North, we have learned not to fear change. Those who are afraid of change will attempt to hold people down, and they will fail. When civilizations are not allowed to grow, the harvest is revolution. Progress might change the environment, but it need not harm the environment. The opportunity and the challenge lie in guiding that process.

LESSON 3. GOVERNMENT MUST NOT BE THE ENEMY; IT MUST BE THE FRIEND.

Little private land exists in the Arctic. Most of the surface of the vast land areas in the Arctic and sub-Arctic are owned by government. Unfortunately, in many societies, it has become the fashion to attack and ridicule government. But in the Arctic, because of its unique role as landowner, government cannot be the enemy. Government must be the friend.

The State of Alaska owns 41,700,405 hectares and the subsurface estate. That's why I call it an *owner state*. Government must regulate, to ensure that our lands and people are not exploited. Government must also advocate. Without government saying "yes," there will be no sustainable economic foundation.

LESSON 4. PEOPLE ARE THE MOST PRECIOUS THINGS ON EARTH.

At the United Nations Conference on the Human Environment in Stockholm, Sweden, in 1972, the chairman of the Chinese delegation, Tang Ke, challenged those who would stop development. "We cannot stop eating for fear of choking," he scoffed. But his most memorable phrase was: "People are the most precious things on Earth." Any parent knows this.

And people throughout the Arctic need help. As old and new ways come in contact, we see conflict, confusion, and despair. Alcoholism and suicide run rampant across the North. Ironically, in Alaska these social ills have been worsened by federal policies. We have forced people to abandon their time-honored pursuits of hunting, trapping, preparing fish and meat, and sewing furs. “We don’t want you doing that anymore,” says the far-off federal government. “So here’s a government check.”

But by taking away work, they have stolen self-worth. Instead, we are learning that the best social program is a job. Work means more than a paycheck—it gives you a sense of meaning, that you, as an individual, are needed. Without that fundamental quality, life is not worth living.

LESSON 5. THERE IS NO WEALTH WITHOUT PRODUCTION.

Sustainable living in the Arctic does not mean making computer chips. Our challenge is to address sustainable living in a resource economy.

People need nature’s resources. To live on Earth, someone has to harvest God’s gifts—cut a tree, catch a fish, dig a hole. If no one is digging in the ground or harvesting from the sea, what goods will people stand in line for?

As the world population expands, most people who live in the temperate, tropic, and subtropic climates will eventually insist that development activities take place somewhere else and “not in my backyard.” That is real.

Therefore, the world’s future resources will come from the Arctic, the Antarctic, the oceans, and space. In the Arctic, instead of fearing resource use, we have the opportunity to wisely use resources.

Most nations would agree that 50 percent of their land would be a reasonable percentage for homes, communities, and an economic foundation. But in my lifetime, and my children’s lifetimes, we will not develop even 1 percent of Alaska.

We must first inventory our lands before they are set aside for a single purpose. To do this correctly, we must invent a yardstick that measures the full range of values important to our people—economic opportunities, space for our communities, the need to subsist off the land, and the intangibles such as the value of a wilderness or a sunset.

When it comes to economic values, we must look at our energy resources. Show me any area on Earth where there is a shortage of energy, and I’ll show you basic poverty.

LESSON 6. THE COST IS TO CARE.

Cleaning up pollution is no longer a luxury. It is an imperative. The best time to pay for the cost of making a product pollution free is when the product is made. Some people ask: “But how much will that cost?” The cost is to care.

In weighing and balancing the risks and rewards, we must set attainable standards based on science and subscribed to by the world community. A collective world demands enlightened policy from all industries, in all countries. There must be a level playing field.

In Alaska, we strongly oppose those who demand standards of us that are neither based on science nor accepted elsewhere. This mentality, the result of a "politically correct" antidevelopment bias, prevents us from exploring for oil in a small part of the 7,692,308-hectare Arctic National Wildlife Refuge to the east of Prudhoe Bay. This is colonialism under a new name.

LESSON 7. WHEN NO ONE OWNS ANYTHING, NO ONE CARES.

No one owns the oceans. No one will ever buy a lot in the ocean or homestead there. This lack of ownership has turned the great fishing ground of the North Pacific into a battleground, a mad scramble for our valuable marine resources. When challenged, a fishing worker replies, "If I don't take the last fish, someone else will."

The whale was the first victim. Then, in our part of the Arctic, scientists wondered what caused the sudden collapse of the king crab population. Some thought it might be a disease. They were right. It was a disease called *greed*. The lesson is to harvest living resources on the basis of sustained yield.

As U.S. Secretary of the Interior in 1970, in the face of angry opposition, I placed all eight species of great whales on the U.S. endangered species list. At the 1972 Stockholm conference, I was instrumental in lobbying for a resolution that called for a ten-year whaling moratorium.

Now, scientists of the International Whaling Commission estimate there are 80,000 minke whales in the North Atlantic. Harvesting several hundred a year will not harm the stocks and will continue a time-honored Norwegian way of life, not dissimilar to our Eskimo whaling tradition in Alaska.

LESSON 8. WE MUST CARE FOR THE WHOLE ENVIRONMENT—PEOPLE, PEOPLE'S NEEDS, AND NATURE.

Sometimes in our drive for economic progress or our commitment to protect nature, we forget about people and their needs. For example, in eastern Russia, northern Canada, and Alaska, soapstone and ivory carving are traditions that fit a subsistence lifestyle. These cottage industries provide income and the pride that comes from creating world class art objects.

Recently, in order to stop poachers who have been killing walruses, a well-meaning U.S. law placed a ban on international ivory sales. We are already seeing the financial and psychological harm this is doing to

our Eskimo peoples. As a result, we may preserve the species but destroy the people who have lived in harmony with nature for thousands of years.

Through trust and working together, we can care for both the wildlife and the people who depend on them. After all, if we can place coded tags on salmon in the ocean, why not use modern technology to identify ivory that has been legally obtained?

LESSON 9. THE ARCTIC IS NOT AS DIFFICULT AS IT IS DIFFERENT.

Arctic people's greatest challenge is to cope with decisions made in the South that don't work in the North. Mostly, these policies are not born of malice, but of ignorance.

For instance, on the North Slope, we had to completely overhaul construction techniques and government regulations designed for warm climates that just didn't work. In the Arctic, heat is the enemy, cold is the friend. We don't drill in the summer, but the winter. Heavy rigs move across the frozen, ice-covered tundra without leaving a trace. They operate from a frozen drilling pad that later disappears.

Likewise, the best form of on-land, surface transportation is not a road. It is an iron wheel and a rail. The Russians proved this with the Trans-Siberian Railway. In Denali National Park in Alaska, home of Mount McKinley, we are looking into a light-rail system to augment the dangerous park road on which noisy, diesel-burning buses carry thousands of tourists, risking their lives and often disturbing the wildlife.

Our greatest environmental problems in the Arctic are not what most people imagine. They are solid-waste disposal, fuel storage, and high-cost energy. The time-honored system of letting the rivers or tides carry away a community's refuse is no longer acceptable. But what is the answer? Landfills don't work on permanently frozen ground. The garbage just piles up. Incineration, which is sometimes a problem in urban communities, may be the answer for the Arctic.

In the summer of 1993, I held a summit meeting to work on the problem of leaking oil tanks in our small communities. The cost to upgrade these tanks may run into tens of millions of dollars. The real answer is to shift from expensive diesel oil to alternative energy sources such as natural gas, small-scale hydroelectric power, and low-sulfur coal. We are also working to combine the present multiple electrical-generating system into a more efficient, collective approach.

Our new-found cooperation between the regional representatives of The Northern Forum is helping us find and share answers to these problems. That is our best hope.

LESSON 10. THE GREATEST FRONTIER IS WITHIN OURSELVES.

Alaska has been called The Last Frontier, but in reality there will be frontiers as long as there are humans. Every child born is given new frontiers to explore. God's way to test us is to give us our own frontiers in our hearts and minds.

Our pioneering days are not over. After all, Arctic peoples can communicate now without being blocked by iron and ice curtains. We can work together to improve our living standards. If we are wise, we will preserve our old values and welcome the new ones. And, on that foundation, we will build a way of life that is truly sustainable. Who knows? We may become a model for the rest of the world.



SUSTAINABLE MANAGEMENT OF THE POLAR REGIONS

Thorbjørn Berntsen

The polar regions have a special appeal. People are fascinated by their ecosystems, which are uniquely adapted to extreme conditions. Hopefully, these highly sensitive and vulnerable parts of the global environment will retain their character, but our knowledge about them must first be expanded.

Among Arctic specialists, polar areas are recognized as a part of nature's data base and contain important information about the planet. However, human activities in the areas and the long-range transportation of pollutants by air and sea threaten the Arctic character. Our common challenge is to protect these unique environments for future generations and ensure that natural-resource use in these areas is sustainable.

The polar ecosystems contain relatively few species, and some of them have low reproduction rates. Damage to one link in the chain may have serious impact on the whole system. Low temperatures and short summer seasons slow down biological and biochemical processes in polar ecosystems, and pollution may have greater effects than at lower latitudes. Also, the effects of human activities take longer to repair.

SCIENCE AND RESEARCH

The virgin state of polar areas make them especially interesting for scientific research, which has shown that changes in climate due to global

warming and ozone depletion will be more severe and may be detected at an earlier stage in these areas. The Arctic has an important impact on global climate, which is why scientific studies on global warming and changes in the ozone layer take place in the Arctic and Antarctic.

The Antarctic

The international cooperation taking place under the Antarctic Treaty of 1959 introduced non-Arctic countries into the group actively involved in protecting polar regions. Norway welcomes this cooperation. The regional and global characteristics of the threats affecting polar wilderness call for wide cooperation among governments, private organizations, and individuals. The Protocol on Environmental Protection in Antarctica is a strict regime that will help retain the environmental character of Antarctica. Even with only 2,000 residents, Antarctica needs strict rules to safeguard its future.

The Arctic

Environmental monitoring in the Arctic indicates that pollutants from human activities far to the south are being transported to the area through wind, ocean, and river currents and are accumulating in the environment and its ecosystems. The Arctic Monitoring and Assessment Program has found that the Arctic's seas are collecting substantial and consistent levels of organic compounds such as PCB and DDT from local sources and land-based sources in Europe, America, and Asia. These pollutants accumulate in the fatty tissues of mammals and fish consumed by local residents and cause health problems.

Studies confirm that the Arctic acts as a sink, collecting heavy metals from local and distant sources. Alarming levels of mercury have been found among Greenland residents, whose diet includes a high proportion of fish and marine mammals.

Crude oil disperses slowly in Arctic temperatures, and severe pollution has been observed from oil activities in northern Siberia. A more extensive search for hydrocarbons in Arctic waters combined with the opening of the northern sea route to general shipping will attract more ocean traffic and increase the risk of oil-spill accidents. I am, however, pleased to announce that an agreement between Norway and Russia to jointly combat oil pollution in the Barents Sea will soon be signed.

Norway has started a limited search for hydrocarbons in the Barents Sea, in which special restrictions strengthen safety and minimize the risk of oil spills. No new areas will be opened for oil activities until an extensive risk assessment has been made to ensure that these activities can be carried out without unacceptable risks to the marine environment.

Radioactivity

Monitoring recently carried out in the Barents and Kara seas indicates that levels of radioactivity in the Arctic do not currently pose a threat to human health or the environment. There is significant concern, however, about the potential risk of radioactivity from nuclear waste dumped in the Kara Sea. The Norwegian government is also deeply concerned about the possibility of radioactive pollution from inland sources like Mayak in western Siberia and from other unsafe concentrations of nuclear waste. Additionally, there is always the possibility of accidents at civil and military nuclear facilities in or near the Arctic.

The level of radioactivity found in the Barents Sea is only half of that measured in the North Sea and is lower than that found in the Atlantic Ocean. The important fish resources in the Arctic are, therefore, still among the least polluted in the world.

The Norwegian government will prepare a white paper on the danger of radioactive and chemical-weapon pollution from the former Soviet Union and eastern European countries that may be a threat to our region. This will be an important basis for formulating our policies and cooperation with other countries in order to meet these environmental challenges.

The threat of radioactive pollution in the Arctic has attracted considerable international attention. Therefore, for two years, Norwegian and Russian authorities cooperated on the investigation and assessment of the risk of radioactive contamination of the northern seas from nuclear waste dumped in the Kara Sea and from other sources. The conclusions of this cooperation will be drawn after a complete examination of the main dumping areas in the Kara Sea, which are also the targets of the second joint examination currently in operation. Experts representing the International Atomic Energy Agency and various European communities are heading this second cooperative study.

The Norwegian-Russian study group inspected the first dumping site at Tsivolki Bay on the east coast of Novaya Zemlya. They performed various systematic water, sediment, and organism sampling studies; preliminary measurements indicated low levels of radioactivity in the area. No measurement above 10 Becquerel per cubic meter has been registered so far, which corresponds to expected background levels.

The study group is now starting its inspection of the second dumping site on the coast of Novaya Zemlya. The preliminary results from the study will be reported at the Consultative Meeting of the London Dumping Convention in November 1993. The final results will be made public in 1994.

The study group has four dumping sites on the coast of Novaya Zemlya on its priority list. However, permission has only been granted to visit three

of them. No final assessment of the risk of future radioactive pollution from nuclear waste can be made until all sites have been thoroughly investigated.

The Russian Federation is facing the formidable task of safeguarding its nuclear facilities and waste deposits. The magnitude of this task calls for international cooperation to provide for sufficient technology, financing, and implementation of effective measures.

SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

Another polar wilderness challenge is to ensure that its abundant natural resources are being managed in a sustainable way. The history of large-scale industrial whaling in the Antarctic is an example of unsustainable harvesting of living resources in polar areas. Such practices fortunately belong to the past.

Overfishing of several important species have also caused periodic imbalances in the polar ecosystems. Today, however, increased scientific knowledge and modern management procedures enable the sustainable harvesting of marine resources.

Many critics have condemned traditional Norwegian coastal whaling practices; some believe that whales are unique and should not be hunted at all. However, few people question the Norwegian minke whaling policy, which is based on sound ecological grounds of sustainable harvesting using stock estimates agreed upon by the Scientific Committee of the International Whaling Commission.

The whaling issue has become mainly political. However, in a politically, culturally, and socially pluralistic world, the only lasting basis for international cooperation in resource management is scientific knowledge and responsible application of international agreements. This also indicates the need to use an ecosystem approach in sustainable management, which ensures that the harvesting of an individual species is managed to retain balance in the ecosystem.

Other human activities could also be managed in a sustainable way, including hydropower development, hydrocarbon exploitation, mineral extraction, forestry practices, marine transportation, industrial production, and extensive military operations. These activities must be carried out in ways that minimize effects on the natural habitats of species that already live under marginal conditions.

The question now facing the international community is: How will it be possible to implement a future policy of natural-resource management in the Arctic and Antarctic that will ensure the survival and sustainable nature



Mating Capercaillies (Tetrao Urogallus). The Capercaillie is a species typical in wilderness areas dominated with vast pine and pine-spruce stands. (Photo by Martti Rikkonen.)

of polar ecosystems? The answer to this question may not be simple, and it will undoubtedly require sacrifice from those who have traditionally regarded polar resources as free booty.

In 1993, the environment ministers from the eight Arctic countries met at Nuuk, Greenland, to review the implementation of the Arctic Environment Protection Strategy (AEPS). One of the objectives of the strategy is to provide for the protection, enhancement, and restoration of environmental quality and the sustainable use of natural resources.

While gathered in Nuuk, a Russian icebreaker chartered by an American tour operator flagrantly violated a protected-area rule at Svalbard. Several other tour operators also recently violated the rules for the protection of Svalbard's natural environment. This is a strong reminder of what happens if tourism is not controlled and carried out in a responsible manner. I will personally follow up on this matter to prevent future incidents and to ensure that tourism in the Norwegian Arctic is developed with careful consideration of this fragile environment.

At Nuuk, the ministers adopted the Conservation of Arctic Flora and Fauna program, which includes measures to protect Arctic habitats through a review of management practices and regulations, assessment of gaps in the protected area system, and examples of effective habitat conservation measures in other areas. The adoption of this program is a concrete example

of using international cooperation to implement the measures called for in the Convention on Biological Diversity and to manage for the sustainable use of natural resources using an ecosystem approach.

In addition, the ministers initiated the preparation of a plan for developing a network of protected Arctic areas that will ensure the future of polar ecosystems, recognize the role of indigenous cultures, and provide a common process to advance formation of protected circumpolar areas. The ministers specifically identified initiatives for developing a process of collecting and integrating indigenous ecological knowledge in the AEPS. It is an important objective to safeguard the needs, rights, and active participation of Arctic indigenous peoples and local populations in relation to regulatory measures for the sustainable management of the region's natural resources.

In recognition of the urgent need to implement the provisions of the AEPS and the Ministerial Declaration on Cooperation in the Barents Euro-Arctic Region, the Norwegian government is working towards identifying the priority areas where Norway can contribute to sustainable management of the northern region. We are ready to cooperate on concrete projects with other circumpolar governments and nongovernmental organizations also devoted to this task, recognizing that we may have a unique opportunity to achieve major regional and global results to ensure sustainable development in the Arctic.



CONCEPTS OF WILDERNESS AND SUSTAINABLE USE OF THE ARCTIC

Bent Muus

Details of the general environmental crisis are now well known. The two great forces of population growth and rising incomes are putting an ever increasing strain on nature's resources. If we consider the United Nation's low estimate for population size for the year 2050, and if it is assumed that the accommodation and feeding of each extra person will need at least 0.25 hectares of new land, the estimated 7.8 billion persons will require an extra 5.75 million square kilometers of arable land—and this will have to be extracted from what is now more or less self-grown nature. If we consider the United Nation's high estimate of 12.5 billion persons, then an extra 17.5 million square kilometers of arable land will be needed, which is an area the size of South America. Therefore, apart from all the other calamities of the global environmental crisis, the overruling development that is threatening the future of natural ecosystems is lack of space.

Modern biogeographical and ecological theory has accumulated substantial evidence on the importance of area size in relation to any attempt at preserving viable populations of plants and animals in nature. Even if we assume the rather unrealistic scenario of a stable, unchangeable physical world, we now know that most protected natural reserves are too small and isolated to hinder long-term accidental extinctions of plant and animal species.

Among the strong arguments for making protected areas such as national parks as big as possible is the newly recognized threat of climate change. Until recently, nobody had seriously reflected upon this possibility. But an increasing concertedly scientific community tells us that climatic

change—brought about by the so-called greenhouse effect—may well be a reality by the middle of the next century.

Agriculture and forestry may be able to actively adapt to climatic change through selection and use of different crops or strains of crops, despite the difficult nature of such a transition in marginal world economies. But natural ecosystems such as the bits and pieces of protected areas and nature reserves scattered as isolated fragments in a denatured landscape of urbanization and agriculture will consequently experience severe difficulties. All organisms are adapted to a certain climatic regime of precipitation and temperature, and these will invariably die out if their basic needs are not met.

When the large ice sheets retreated after the last ice age, the fauna and flora were able to spread northwards following the biological and climatic conditions to which they were adapted. Similar dynamic translocations are no longer possible for most species. Their way is now barred by the modifications to the landscape wrought by 5 billion human beings. Only organisms with great dispersal ability such as birds and flying insects may be able to find new territory after climatic change.

Most biologists have realized by now that the inertia of the world community is such that great and irreversible losses in biological diversity are unavoidable within the next few decades. The necessary, radical changes in production and market practices that will bring this about are bound to occur. All one can hope for is that humans come to their senses in time to save a reasonable proportion of what we may call original ecosystems and sceneries.

One step in that direction is the recent canonization of sustainability. All sensible people will agree that exploitation of living resources should be done in a sustainable way, and that it is stupid to ruthlessly exploit natural resources that are useful or otherwise valuable to humans. Thus, we may define *sustainability* as “exploitation of natural resources that is done at a tempo within the capabilities of plants and animals to renew their populations and is accomplished in a way that secures the diversity and continued existence and viability of the species and ecosystems of which they are a part.”

Unfortunately, besides being intelligent, humans are also greedy and selfish, and their societies are without laws and rules about environmental exploitation that are as strictly enforced as the Income Tax Act. As a result, the world will lose its biological assets one after another through the collective effect of thousands of small but unwise interferences with nature. This is happening in industrialized and developing countries worldwide.

The concept of sustainable utilization cannot be left to diverse private interpretation. To have meaning, it must be defined, adopted, and carried

into effect by political instruments. A great step in this direction was the Brundtland Report, "Our Common Future," which presented national environmental problems as integrated aspects of global concern to politicians worldwide.

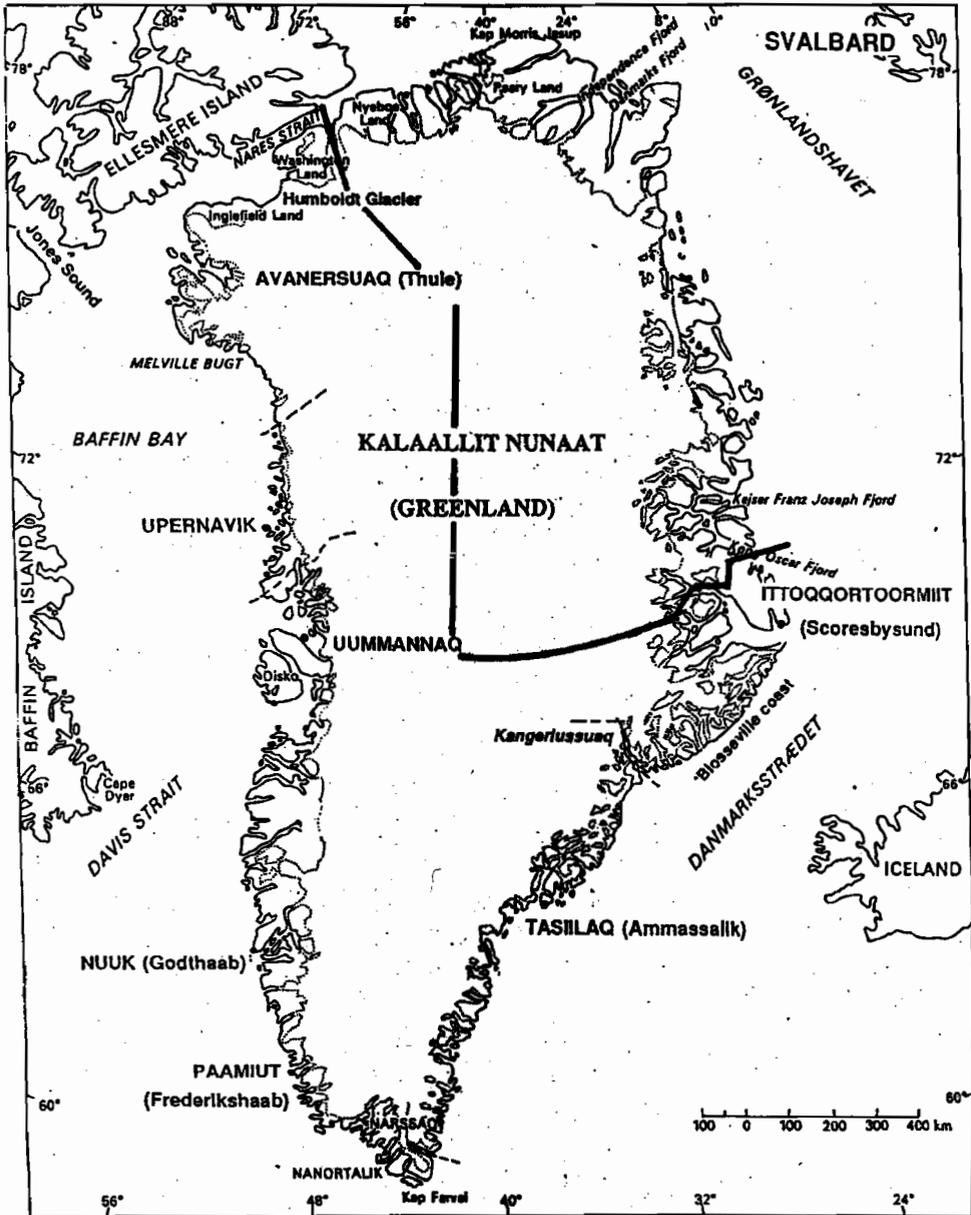
The term *sustainability* implies that there are limits that should not be transgressed. The phrase *sustainable development* was coined in order not to frighten away economists and other conventional believers in the concept of ever-increasing material wealth.

Sustainable development is not an easy concept to understand and even more difficult to practice. For example, although the Arctic and Arctic-boreal indigenous peoples often claim to practice traditional sustainable natural-resource extraction, modern techniques and rising population pressures have forced them to change their means of exploitation. Speedboats, snow scooters, nylon nets, telescopic-sighted rifles, and helicopters are now commonly used "vehicles" for natural-resource extraction among the modern Sami of northern Scandinavia and the Inuit peoples of the Arctic. Criticism of these "traditional" methods is usually not well received.

Unfortunately, because intrinsic human shortsightedness and opportunism seem to be equally well developed in cold and warm latitudes, the ubiquitous signs of overexploitation in the rest of the world are now also plainly visible in the Arctic. Several signs of this are particularly evident in Greenland. For example, the formerly rich bird cliffs near West Greenland settlements are now desolate due to excessive hunting from speedboats; the walrus has disappeared from the southern parts; the Arctic char is being overfished in the rivers; and overgrazing by sheep has caused soil erosion to land that will take hundreds of years or millennia to form new, fertile top soil. Thus, Greenlanders share with the rest of the world the problems, blessings, and curses of modern exploitation techniques, but their environment is far more fragile than those more southerly, and their ecosystems are in precarious balance.

Everybody seems to agree that using a sustainable approach is the only sensible way to administer natural-resource extraction and exploitation. Yet, despite all the talk, this goal is difficult to achieve. The concept of sustainable development has, in fact, become fashionable to such a degree that it is now often understood to mean that all natural resources that can be utilized should be so, if done in a sustainable way. But this is a severe misconception. If a reasonable fraction of the world's biodiversity and geodiversity is to survive the human impacts in this and the next century, we must set aside the necessary space for its survival.

There are several unpopulated or sparsely populated natural areas and fragile ecosystems in this world that would be best left as intact ecosystems



and sceneries and not implicated in “sustainable development.” Such “wilderness” areas can still be found in Arctic and Arctic-boreal regions. East Greenland Park is a good example. The park was established in 1974 and, with the latest expansion in 1988, it covers 972,000 square kilometers. One might wonder how such a grandiose and unusual gesture towards nature was politically made possible. The explanation is that the establishment was practically cost-free. Eighty-five percent of the park is the two- to three-kilometers-thick icecap, and the ice-free land is largely uninhabited, apart from the Sirius Patrol military headquarters and a couple weather stations. Only about forty people live more or less permanently in the park.

Even without the icecap area, the park is still large, roughly 150,000 square kilometers. It is a magnificent coastal landscape with large mountains intersected by fjords and valley systems, directly stretching 1,400 kilometers over 13 degrees latitude.

Along the coast, running southerly, is the cold and ice-filled East Greenland Current, which limits mainland access. Only the southern half of the park is accessible by ordinary ships in the summer. It is a wilderness area if ever there was one.

The national park is one of the 215 Man and Biosphere (MAB) reserves under the United Nations Economic, Social, and Cultural Organization (UNESCO). A MAB reserve is a large, compact area chosen as example of an ecosystem that the world community does not want to lose. According to UNESCO, the fifty-eight countries that established the MAB reserves will create long-term research projects to learn about the areas' climatology, topography, geology, and natural history.

The MAB reserves are important steps towards achieving collective international responsibility for environmental resources of international significance. We must encourage the attitude that even if nations have legal power over their natural resources, the world community has the moral right to expect that each country protect and preserve unique features of world-wide importance.

Thus, East Greenland National Park is not just an amenity and a feather in the cap of the Greenland Home Rule—it is a serious international commitment. As a protected area, the park shares a lot of problems with other reserves in the Far North.

Among the dangers threatening most of the existing parks and wilderness areas worldwide is the search for mineral deposits and oil. Ministries for energy and raw materials generally seem to be staffed by people utterly insensitive to arguments other than economic ones and to whom the preservation of nature is as unpronounceable as a Greenland settlement. To them, a natural area is only worth protecting until valuable minerals or oil are discovered.

Since the establishment of East Greenland National Park, the Nordic Mining Company and Geological Survey of Greenland have been searching for minerals there. A large molybdenum deposit was discovered in 1953, and deposits of lead, zinc, copper, gold, silver, tin, uranium, strontium, and barium have also been found. Fortunately, most of these ore reserves cannot currently be profitably exploited because extraction and transport costs are so high. However, sooner or later world market prices or new findings of high-grade ores will change this.

Another Sword of Damocles hanging over the park is oil and gas prospecting. Jameson Land, bordering the park on the south, is being explored for oil. Also, geologists suspect that certain offshore, although inaccessible, areas contain promising oil reserves.

Hopefully, there is no oil in the park that is worth drilling for now or in the future, and any mining will be short-lived and small-scale. It is utterly unacceptable that mining and oil drilling take place in an otherwise highly protected national park where shooting animals and harvesting plants are not allowed.



East Greenland National Park. (Photo by Bent Muus.)

Arctic nature is vulnerable, and scars from human activities remain for centuries. Extraction of subsoil raw materials invariably causes pollution, and the construction of roads, storage space, harbor facilities, houses, and airstrips to support the mining industry cause topographical transfigurations, not to mention the direct mining effects. Such enterprises may be necessary in other areas, but not in such a rare, natural area.

Human activities in the park have thus far not spoiled its natural qualities to any serious degree. Oil drums and rubbish remain from early expeditions, but this is slowly being removed, and, apart from a few permanent stations that have special rules, no one visiting the park is allowed to leave behind any kind of everlasting junk. And, plans for clearing and reestablishment must always be made for geological investigations and drilling or mining activities.

What could be considered sustainable and acceptable management of East Greenland National Park? We can quickly dismiss extraction of raw materials, which is an irreversible process and incompatible with the concept of conservation.

A viable train of thought is that the park is in the unique position of being, in principle, uninhabited. The nearest settlement is Ittoqqortoormiit (Scoresbysund), a town in the southern part of Jameson Land with about five hundred inhabitants. The only other community is Tasiilaq (Ammasalik), a town 850 kilometers further south with about three thousand inhabitants. A few hunters from Ittoqqortoormiit are allowed to kill polar bears in the park using dog sledges, but snow scooters are not allowed, and only in emergencies are hunters allowed to shoot other animals. This system is called *traditional hunting*, which perhaps is a rather liberal interpretation because Ittoqqortoormiit was established in 1925, and its settlers came mostly from Ammasalik and were not traditional polar-bear hunters like those in north-west Greenland (Thule).

This hunting is thought to be permissible because a surplus of bears comes down with the East Greenland Current ice flow and the bears are sometimes swept even to southwest Greenland, where they are invariably shot in the sheep-farming districts. The only other hunting allowed in the park is that by the crews of the permanent stations who shoot a few seals as supplementary food for their sledge dogs and hares and ptarmigans to break the monotony of canned food. With the exceptions mentioned, hunting is thought neither necessary nor compatible with preserving Arctic fauna in its natural setting.

Another asset that is more consistent with sustainable management of the park is regulated tourism. The southern end of the park could gently be developed for that purpose. Suitable buildings and a large airstrip exist at Mestersvig, left over from a lead and zinc mine that closed down in 1962.



*Old hunting cabin at Zackenberg in East Greenland National Park.
(Photo by Bent Muus.)*

The park has been divided into three zones of varying protection priority. In valuable and highly vulnerable areas (zone 1), admission is only given in special cases, usually for scientific purposes. In important but less sensitive areas (zone 2), only experienced and trustworthy visitors are allowed. The *interesting localities* (zone 3) are open to all visitors, provided they obey the rules and possess approved safety equipment.

Tourism has developed into the world's greatest civil industry. Dedicated ecotourists, amateur naturalists, and student groups are among the obvious potential users of the park. It is large enough to allow each visitor the feeling of being alone in the whole world. Furthermore, tourism in the southern end of the park will provide welcomed employment to people from Ittoqqortoormiit as guides, sledders, and rangers.

About twenty Danish and other international expeditions visit the park each year for mountaineering in Stauning's Alps, natural science research, archaeology, or other outdoor-adventure activities. The size of the park and costly logistics will ensure that the park is not overrun by people.

Another of East Greenland National Park's important assets is its scientific field-research potential in glaciology, geology, and biology. There are

no permanent research facilities in the park, but a permanent field station near Clavering Island at Zackenberg is being planned. A research program called Zackenberg Ecological Research Operations (ZERO) has been developed in connection with the international Global Climate Change research initiative. The project's goal is to describe the natural structure and dynamics of the undisturbed, high-Arctic ecosystems of northeast Greenland; its objective is to obtain reference data at "zero-time" that can be used to assess and monitor global climate change.

For such a project, it is important that the protected wilderness is large enough to cover a wide spectrum of climatic conditions and has a diverse topography. This will enhance the viability of many plant and animal populations during a climate change because there will be room for "patch-dynamic" translocations. Also, East Greenland National Park's north-south extension allows many organisms to alter their present distribution after precipitation and temperature changes.

Theoretic considerations based on ecological evidence point to the fact that most reserves created to protect local biodiversity are too small to serve their long-term purpose. The threat of global climatic change accentuates this problem. As regards nature reserves, governments and their ministries of energy should free themselves from their oil and mineral syndrome and live with the notion that billions of dollars worth of natural resources may be hiding safely protected in the ground under a national park.

In addition, sustainable utilization of renewable biological resources is easier to talk about than to practice. For example, an incredibly wasted nonrenewable resource like gasoline is now cheaper to buy than bottled water in the United States.

If sustainable use is to be effectively practiced, activities like hunting and mining need to be carried out with extreme delicacy and sensitivity to the environment. Simultaneously, expansive areas need to be set aside as highly protected wilderness reserves and, apart from regulated ecotourism and scientific research, be free of *any* kind of development, sustainable or otherwise. East Greenland National Park is one such example.



SUSTAINABLE WILDERNESS IN THE ARCTIC

Pamela Miller

The founders of The Wilderness Society in 1935 had a vision of legally protecting large areas of untrammelled wild nature as wilderness, and they had a special interest in the Arctic. My ideas stem from their strong roots, but the question of sustainability is even more critical today because the pressures on Arctic wilderness—and wilderness worldwide—have accelerated so that opportunities to protect it are rapidly diminishing.

As an Alaskan, I am compelled to comment on Alaska Governor Walter Hickel's remarks as an introduction to my own. My favorite quote of his, something he said during the recent controversy over the state's wolf control plans, is: "You can't just let nature run wild."

One of his favorite projects is the proposed water pipeline to ship fresh water to thirsty California. No, we haven't built it yet. However, Governor Hickel clearly cares about Alaska and understands that the state needs big projects. Small oil fields, coal projects, or hard-rock mines are not economically viable because of the vast distances and costs involved.

So too, wilderness in the Arctic must be big. To be sustainable—even more so than at lower latitudes—large wilderness areas are needed in order to encompass the requirements of animals that generally have larger home ranges in the North and to protect habitats with sparse, slow-growing plants. Wilderness must also be big to maintain the traditional subsistence activities and cultures such ecosystems support and retain the intrinsic qualities of such untrammelled expanses for future generations.

For tens of thousands of years, the Inupiat, Gwichin Athapaskans, and other indigenous cultures lived sustainably. With the arrival of the Yankee



Children at Gwitch'in gathering, Venetie, Alaska, 1992. (Photo by Pamela Miller.)

whalers and other Europeans, borderlines were established, with the straight demarcation of the United States and Canada border one of the first imposed on the wilderness ecosystem.

The first call for wilderness protection in the Arctic was *really* big. It came in 1938 from Bob Marshall, a Wilderness Society founder who had extensively explored northern Alaska. He said: "All of Alaska north of the Yukon River, with the exception of a small area immediately adjacent to Nome, should be zoned as a region where the federal government will contribute no funds for road building and permit no leases for industrial development. ... In the name of a balanced use of American resources, let's keep Alaska largely a wilderness."

But much has happened since 1938 to change the Arctic. Oil was discovered at Prudhoe Bay. As a result, the U.S. Arctic was bisected by the Trans-Alaska Pipeline, and with the settlement of native claims and state land conveyances, opportunities for legally protecting big wilderness in the Arctic are now on a different scale. Further expansion of the North Slope oil fields, including the recent discovery of a huge field, Kuvlum, located in the Beaufort Sea 24.1 kilometers offshore from the Arctic National Wildlife Refuge, poses further threats.

In the Arctic, in contrast with lower latitudes, we still have opportunities to protect whole ecosystems and conserve biodiversity at a landscape scale. In Alaska, we have had some remarkable successes. The establishment of national parks, preserves, refuges, and wilderness areas by the Alaska National Interest Lands Conservation Act in 1980 was a farsighted beginning.

As Secretary of the Interior Cecil Andrus testified before Congress in 1979 during deliberations on this legislation, “a basic premise of our recommendations was that in Alaska we were able to draw boundaries that would be ecologically sound, thus avoiding the costly mistakes of the past and the compromises dictated by trying to salvage remnants of natural systems.” It was Alaskans—biologists, guides, fishing-industry workers, and citizens from the Alaska Wilderness Coalition—who compiled key maps used for drawing the boundaries of special, natural places.

Some say that we have already protected enough of Alaska. The Alaska Lands Act set aside 51,417,004 hectares in national parks, preserves, and refuges. That’s 38 percent of Alaska’s 148,987,854 hectares. Another 35,627,530 hectares, also in federal ownership, is managed by the USDA Forest Service and USDI Bureau of Land Management under “multiple use” mandates allowing extractive timber harvesting, mining, and other commercial activity, not the more specific conservation purposes that are drawn up for the parks and refuges.

Most of the areas established by the Alaska Lands Act were conceived of as wilderness parks and refuges with the primary goal of retaining intact ecosystems for their biological diversity. Congress recognized in the legislation that wilderness designation in Alaska would be somewhat different than in the rest of the United States—except in parks that had been established prior to 1980—because indigenous peoples were still an integral part of the ecosystems, as they had been for thousands of years. Therefore, subsistence and other traditional activities, including the use of snow machines, aircraft, and motorboats, are allowed in most wilderness areas, and sport hunting is allowed except in national parks. The emphasis was on habitat protection.

But less than half the acreage of the parks, preserves, and refuges in Alaska is included within the National Wilderness Preservation System, the most protective U.S. land designation. Most of this wilderness is in parks. In other areas, the restrictions on what kinds of development activities may be legally allowed are not strictly defined, contrary to popular perception that the Alaska Lands Act “locked it up.”

Indeed, we have designated 22,429,150 hectares—15 percent of the land-mass of Alaska—as wilderness. But have we protected critical parts of the ecosystems in order to adequately conserve biodiversity? This is particularly crucial because elsewhere, ecologists have realized that designated wilderness and other protected areas in the continental United States are of inadequate size and number to maintain biodiversity. Because of this, there has been a major shift in thinking from wilderness preservation to sustainable management, according to Reed Noss in “Sustainability and Wilderness” from

the March 1991 edition of *Conservation Biology*. Yet, Noss and others, including the Wilderness Society, advocate protection of huge, roadless areas that extend beyond existing parks or wilderness tracts. For example, the Greater Yellowstone Coalition is trying to correct the problems resulting from boundaries that were too small for animals dependent on wilderness, such as grizzlies or wolves, to thrive.

Sustaining wilderness in the Arctic is still the best way to protect biodiversity on a landscape scale. It is therefore premature to shift emphasis away from a wilderness preservation-of-ecosystem level to a type of management allowing “sustainable development” everywhere. There is still room for large areas to be “managed” (i.e., set aside) as wilderness. There is no such thing as multiple use that would conserve wilderness in the long term. The two concepts are incomparable because of our propensity to think we can just go elsewhere to find more oil, or water for California, instead of modifying consumption to live within limits.

Recent events in Prince William Sound show the failures of “multiple use.” Many believed that the passage of oil tankers from the Valdez Trans-Alaska Pipeline terminal would be transitory and that consequently the nearby wilderness would remain unaffected. The millions of gallons of oil that spilled from the wreck of the *Exxon Valdez* changed all that, with the obviously soiled wilderness beaches. But it also resulted in a surge of commercial activity and a busy time for hunting and fishing guides in the region.

Have we done better at preserving biodiversity in Alaska than in the continental United States where primarily scenic mountaintops—rocks and ice—where there were less controversy and productive valleys, were designated wilderness? A map of Alaska shows that we still have a long way to go in the Arctic. Most of the designated Arctic wilderness is located in the Brooks Range. We have established spectacular wilderness parks like Gates of the Arctic and Noatak National Preserve. But little of the productive wildlife habitat north of the Arctic Circle has been designated wilderness. In fact, the 9,311,741-hectare National Petroleum Reserve in Alaska has oil and gas exploration as its primary purpose, with inadequate protection for biodiversity. It has not even been studied for wilderness potential. The Arctic National Wildlife Refuge is, to some degree, the exception.

To protect biodiversity in the Arctic, Dr. Glenn Patrick Juday (Alaska ecological reserves coordinator, University of Alaska at Fairbanks) says that we should consider decisions to protect Arctic resources at landscape scale, pay special attention to diverse landscape regions, and find and protect or carefully manage the genetic wealth of glacial refugia.

The Arctic Wildlife Refuge lies in the northeast corner of Alaska. It is an extremely diverse landscape region where, as Juday notes, the juxtaposed

coastal plain-mountain-river-seashore-estuary-island areas represent a zone of exceptional diversity. The refuge includes the complete spectrum of sub-Arctic and Arctic habitats, from boreal forests (taiga) to the tallest peaks in the Brooks Range, which arch north close to the Beaufort Sea. The North Slope foothills sweep down to the narrow coastal plain, a glacial refugium bounded by lagoons and barrier islands on the north.

The Arctic Wildlife Refuge encompasses approximately 8 million hectares, of which some 3 million have been designated wilderness—more than in any other national wildlife refuge. The Arctic National Wildlife Range was established in 1960 “to protect its unique wildlife, wilderness, and recreational values.” In the Alaska Lands Act of 1980, the original range was greatly expanded to incorporate the wintering grounds of the Porcupine caribou herd, and its original purposes were revised to include conservation of natural diversity, maintain international treaty obligations, and support subsistence uses. The original refuge was designated wilderness, except for a critical 607,288-hectare area of the coastal plain that was coveted by the oil industry. I will expand on this later, as it epitomizes the difficulties in achieving sustainable Arctic wilderness.

Decades ago, conservationists who fought to establish the Arctic Wildlife Refuge envisioned preserving an undisturbed portion of the Arctic large enough to be biologically self-sufficient. Of particular concern was protection of the entire range of the Porcupine caribou herd, which is partly in the United States and partly in Canada. Olaus Murie, the great naturalist, studied the caribou in northeastern Alaska during the 1920s, and later, he and his wife, Mardy, played a major role in the effort to establish the Arctic Wildlife Refuge. By 1952, Dr. Aldo Starker Leopold and Sir Frank Frazer Darling recommended that the wilderness character of this area be preserved and noted in *Wildlife in Alaska* that already “the seemingly remote Arctic has been so changed by fire, reindeer herding, grazing, wolf control, hunting, and fishing that there is shockingly little of it left unaltered.” Also, the increasing loss of its remote character due to airplane access intensified concerns for wilderness protection.

By 1953, George Collins and Lowell Sumner of the USDI National Park Service (NPS) had outlined on maps an Arctic International Wilderness. In addition to a focus on wildlife, wilderness, recreation, and scientific study in this transboundary area, they believed it could provide a land base for indigenous cultures and recommended that the Inupiat and Athapaskan peoples play a major role in management of the area together with the federal and state government agencies. So, while Collins and Sumner had conceived the area as a park to allow continued subsistence hunting, fishing, and trapping by the indigenous peoples and not to foster overdevelopment of the area in

a promotion of mass recreation, a refuge was ultimately pushed for instead of a park.

Resurgence of interest in a big international protected area culminated in 1971 with the Arctic International Wildlife Range conference, followed by Canadian and NPS proposals. Today, the first large-scale wilderness reserve for wildlife ranging across international boundaries in the circumpolar Arctic is comprised of the adjoining Arctic Wildlife Refuge and Ivvavik National Park (northern Yukon), created in 1986, and Vuntut National Park, formed in 1993. Although these areas are still managed as separate entities, an international conservation agreement signed by the two countries in 1987 established the International Porcupine Caribou Board to further conservation of the Porcupine caribou herd.

Unfortunately, one of the most critical habitats—the controversial 607,288-hectare coastal plain sought by the oil industry—has yet to be adequately protected through wilderness designation by the U.S. Congress. The coastal plain is the most biologically productive part of the Arctic Wildlife Refuge and the center of wildlife activity, according to the USDI Fish and Wildlife Service.

This coastal plain area is used for extremely high-density calving and postcalving by the Porcupine caribou herd and contains its most sensitive habitats, according to the conservation plan in the 1993 assessment of the area made by the International Porcupine Caribou Board. This herd of approximately 180,000 animals travels thousands of kilometers to this area each year from wintering areas south of the Brooks Range in Canada and the United States. The Alaska Department of Fish and Game found that females with calves in the resident central Arctic herd near Prudhoe Bay are particularly sensitive to oil-field disturbance that has displaced caribou from some preferred calving areas. Biologists predict that the ten-fold larger Porcupine caribou herd would have even more severe reactions to disturbance and pipelines across their calving areas and migratory routes than has the central Arctic herd.

The oil industry and the State of Alaska claim the effects of oil development in the controversial 1.5-million-hectare coastal plain area would be minimal, that their “footprint” will be small even though oil fields involve networks of roads, pipelines, and other facilities. By contrast, the U.S. Department of the Interior concluded in its environmental impact statement that oil development in the coastal plain would have major effects on the Porcupine caribou herd, musk oxen, water quality and quantity, subsistence, recreation, and wilderness. Polar bears denning in high densities and as many as 300,000 staging snow geese that migrate there from Canada in the fall are also seriously threatened by oil development.



*Porcupine caribou herd on coastal plain, Arctic National Wildlife Refuge, Alaska.
(Photo by Pamela Miller.)*

This controversial coastal plain area in the Arctic Wildlife Refuge cannot be exploited without the approval of the U.S. Congress, and there has been intense pressure for this. A proposal to include oil drilling in the refuge as part of National Energy Strategy legislation was defeated in the U.S. Senate in 1991. Environmental nongovernmental organizations (NGOs) and the Gwichin people whose culture depends on the Porcupine caribou herd continue to build support for permanent protection of the coastal plain through wilderness designation. To allow oil development in this most sensitive part of the Arctic Wildlife Refuge threatens the sustainability of the larger ecosystem and “big wilderness.”

International protection for this ecosystem is being sought in a resurgence of effort. “Caribou Commons” is one of the areas nine U.S. environmental NGOs included in a recent proposal submitted as part of the habitat protection efforts in the Arctic Environmental Protection Strategy. “Caribou Commons” is proposed as an international bio-cultural reserve that seeks to have the existing Arctic National Wildlife Refuge (with needed wilderness designation for the coastal plain) and Ivavik and Vuntut National Parks as core protected areas, and would contain the entire range of the Porcupine caribou herd in order to carry out an ecosystem management approach.

Other Arctic transnational proposals exist, such as the Bering Land Bridge region proposal. Also, encouraging steps for establishment of the Beringia

Heritage International Park were taken with an agreement by former Soviet Union President Mikhail Gorbachev and former U.S. President George Bush in 1990. However, marine area conservation has been neglected to date. We proposed an Arctic Ring of Life Marine Biocultural Reserve, encompassing the dynamic and productive region south of the permanent Arctic icecap that includes open-water areas along the Arctic Ocean coastline.

To set up new, international protected areas is a major challenge, as is upholding the integrity of existing areas such as the Arctic Wildlife Refuge. Threats such as transboundary toxic contamination, global warming, and ozone depletion will not be solved by drawing lines on maps. But it is essential to have such lines that tangibly mark our intentions to have wilderness ecosystems in the future. Without them, wilderness will disappear before we even notice it. We simply don't have the scientific knowledge or the political will to balance extractive development with ecosystem maintenance.

I spent many summers on the coastal plain of the Arctic National Wildlife Refuge as a biologist studying the impact assessment of potential oil development on birds and monitoring winter seismic oil exploration. Recently, I camped alone on the refuge coastal plain for the first time.

I set up my tent in the path of the caribou, just eight kilometers from the shimmer of sea ice, in view of the Brooks Range. I climbed the easiest route up the bluff, where my boots pushed into the patterns made by hundreds of animals. Tufts of white hair were teased into hundred-year-old willow branches. Hard hooves had churned up a marsh. Dislodged from its promontory, a golden eagle floated the ridge. Below, a tangled calf, plucked clean except for shreds of skin on its legs, was heaped by the river. On the next terrace, tucked below a *Dryas* blossom was a small antler, its tip gnawed rough by voles or lemmings, with scattered caribou droppings alongside it. Caribou hair lining elbows of the river was matted together like rope. Bull antlers gripped a complete skull. Soft mud was filled with caribou tracks and the single passage of a wolf. I sat on a pingo lush with Jacob's ladder around fox den entrances, and a caribou with her tiny calf walked close by, curious. In four days, I saw just a dozen caribou. With every step, signs of caribou. In closing, some words Mardy Murie wrote about the Alaska lands battle in *Two in the Far North*:

Wilderness itself, the basis of all life, does it have a right to live on? ... Do we have enough reverence for life to concede to wilderness this right?



AN ECOSYSTEM APPROACH TO FISHING AND MANAGEMENT ACROSS THE NORTH ATLANTIC

Michael Earle

Cod stocks across the North Atlantic are generally in a perilous state, with biomasses at low levels and moratoria being imposed in some fisheries. After briefly reviewing the recent history of the principal stocks and examining the role of overfishing in their decline, I propose a new approach to fisheries resource management that is precautionary in nature.

A SHORT HISTORY

During the 1960s, the average catch of Atlantic cod was some 3 million tonnes per year. Almost 70 percent of that came from four stocks: (1) West Greenland cod, (2) northern cod found off the Newfoundland-Labrador coast, (3) northeast Arctic cod found in the Barents Sea, and (4) Icelandic cod.

By 1972, fisheries scientists were warning that the level of exploitation was excessive. A review of cod stocks across the North Atlantic stated that recruitment failure could occur unless spawning stocks increased, and that a desirable level of fishing effort would be approximately half the level of that currently being exerted. The review concluded with the prophetic comment that “exploitation [of cod stocks] is rapidly increasing, and opportunities for relatively painless diversion of surplus effort may not last much longer.”

The 1960s and early 1970s were the heydays of the distant-water fishing fleets. Coastal nations had not declared their exclusive economic zones (EEZs), and thus the fleets were free to fish relatively unhindered wherever they

chose. Restrictions on fishing were generally limited to measures such as minimum mesh and landing sizes, but they were virtually unenforced.

During the 1970s, many of the cod-fishing grounds were enclosed within newly declared EEZs, and coastal states began ejecting the distant-water fleets from their waters. More complicated management measures, such as total allowable catches and limitations on entry into the fishery, were introduced to allow the recovery of depleted stocks. Enforcement was increased, and sophisticated stock assessment techniques were developed.

Unfortunately, these measures have largely failed to maintain cod stocks at abundant and productive levels. The total catch of Atlantic cod in 1991 was less than 1.5 million tonnes or about half of the total during the 1960s. Recent assessments of major stocks have generally been dismal, with few exceptions:

- the Northern cod stock was reported in 1993 to be at “probably the lowest abundance in the 20th century”;
- in mid-1991, the offshore trawl fleet stopped fishing off West Greenland due to poor catch rates; and
- the International Council for the Exploration of the Sea declared in 1992 that the spawning-stock biomass of Icelandic cod was close to the lowest on record.

Alone among the major cod stocks of the North Atlantic, northeast Arctic cod has been increasing over the past few years from its low point in the late 1980s, following drastic reductions in fishing effort, and the stock seems to be recovering.

Possible Causes of the Declines

Many factors—both real and imaginary—have been suggested as causes of the current crisis in the North Atlantic cod fishery. Among the more frequently proposed factors are various types of multispecies interactions (usually involving predation by or competition with marine mammals). Interactions among species are poorly understood and extremely difficult to predict, and a full discussion is beyond the scope of this paper. Thus far, however, no convincing case has been made that either seals or whales are implicated in the declines of any of the cod stocks.

The possible role of changing environmental conditions (e.g., increased ice cover and colder water) has also been discussed. There is no doubt that climatic fluctuations have an impact on the abundance of cod through such processes as recruitment and food availability and could have contributed to the declines in some cases such as at West Greenland. Nonetheless, stocks

that are in a depressed state are the most vulnerable to such changes. Healthy stocks are able to resist short-term fluctuations because they contain more year classes, and fishing mortality is lower.

The Role of Overfishing

The common link among all of the declines has been overfishing, evident since 1972, and which can take many forms. The simplest and most blatant form occurs when total allowable catches (TACs) are set at levels that are higher than the scientific advice recommends. This was a common custom for North Atlantic cod in the 1980s. It has been most pronounced in Iceland, where it has happened every year since 1985 (with the exception of 1986). In 1985, the TAC was set at a figure that was 32 percent higher than the recommended level.

Once set, TACs are often exceeded. From 1985 through 1990 in Iceland, for instance, the nominal catches surpassed the TACs by up to 28 percent. For northeast Arctic cod, the catches have been as much as 40 percent higher than the TAC.

Similar problems have occurred with the northern cod stock. The TACs were generally established in line with scientific advice for the Canadian fishery until the critical state of the stock became evident at the end of the 1980s. Beginning in 1989, the TACs were established at levels higher than those corresponding to fishing mortality rates of $F_{0.1}$ (a fishing mortality rate used to set ground fish TACs in Canada, corresponding to the level of fishing at which adding one more boat increases the total catch by only 10 percent as much as the first boat to fish that stock), which was the government's stated policy. For instance, the $F_{0.1}$ TAC in 1989 would have been 125,000 tonnes, but the TAC was set at 235,000 tonnes. In the international waters outside Canada's EEZ, the European Community fished for northern cod for several years despite a moratorium established by the North Atlantic Fishing Organization (NAFO). Between 1986 and 1991, the community allocated itself 346,360 tonnes and reported catches of 207,272 tonnes.

Thus, nominal cod catches have generally been far higher than the scientifically recommended levels. For example, in 1984, the northeast Arctic cod catch was 85 percent higher than the recommended TAC; and, in 1987, the West Greenland cod catch was 275 percent higher than the TAC.

These examples of overfishing are only the "official" ones based on nominal catch statistics. In addition, there are a variety of other practices that increase fishing-induced mortality, but which are rarely quantified.

Discarding occurs when fishermen use gear that catches fish that they do not want because of its low market value or fish that they are not allowed to keep due to landing restrictions. Though the practice occurs in most

fisheries, estimation of its extent and impact is rare. A few studies have addressed the problem in North Atlantic cod fisheries.

Canadian work during the 1980s has shown that the discard rate from offshore trawlers was as much as 38 percent by number or 19 percent by weight of the total cod catch. While most of those were small fish of less than 42 centimeters in length, there were also fish greater than 48 centimeters in length being discarded. Cod traps in Newfoundland catch large numbers of small fish as well: 30 percent or more of the cod are less than 42 centimeters in length in some years. A study of the Norwegian fishery suggested that 960 million fish were discarded between 1986 and 1989.

Cod and other ground fish such as shrimp and redfish are incidentally caught in other fisheries and are discarded because either the vessel has no quota for cod, or it is uneconomical to conserve and land the by-catch. Recent technical advances in gear selectivity such as the Nordmore grill allow the reduction of such by-catch in some cases, but the impact of cod discards in other fisheries over the course of the past few decades could have been significant.

Another practice known to occur but difficult, if not impossible, to reliably quantify is misreporting of catches. Pressures created by excess fishing capacity in pursuit of less abundant resources often lead to various inaccuracies in logbooks and other records. Fish can be caught in one area yet be recorded as caught in another or not recorded at all. Catches of northern cod reported to the NAFO by the European Community for 1991 were 40 percent below the Canadian surveillance estimate: 24,464 tonnes compared to 41,900 tonnes, respectively. The type of regulations in effect influence the extent of misreporting; for example, individual vessel quotas serve to encourage it. Without effective surveillance programs, the extent of such deceit will remain largely unknown.

The upshot of all of this is overfishing: The fishing effort on the cod stocks is substantially higher than the recommended scientific levels. In the case of northern cod, levels of fishing mortality throughout the 1980s have ranged from 0.3 to 1.0 in 1989, while the management objective of the fishery is to fish at $F_{0.1}$, which equates to a mortality rate of 0.2. Fishing mortalities on the other cod stocks across the Atlantic have been of a similar magnitude during the 1980s.

Overfishing is not limited to cases in which more fish have been caught than the recommended scientific levels. The scientific advice itself can sometimes lead to overfishing, even if it is rigorously followed. For example, use of poor quality data can lead to errors in stock assessment, which may result in recommending catch levels that the stock cannot support.

This highlights one of the major problems confronting fisheries science: uncertainty over the abundance and dynamics of various fish stocks, the

ways in which they interact with each other and with their environment, and the true level and distribution of fish catches. Management decisions that are made without taking explicit account of such uncertainty can seriously increase the risk of the stock's collapse. This is well known, yet there are few fisheries management institutions that give serious consideration to the long-term consequences of this uncertainty.

Another problem has been the continued use of some variant of Maximum Sustainable Yield, or $F_{0.1}$, as the general objective of fisheries management across the North Atlantic. Yet, strict adherence to these reference points as an objective can result in highly variable catches, reduced stock abundance, and an increased risk of collapse.

Viewed from this perspective, it is not surprising that cod stocks are generally in a poor state. Environmental changes may have contributed to declines in some situations, but even in these cases, overfishing has reduced the stocks to the point that fluctuations in water temperature, ice cover, and other environmental parameters may detrimentally affect the stock. The current state of cod stocks across the North Atlantic is testimony to the shortcomings of the current management approach.

THE NEED FOR A PRECAUTIONARY APPROACH TO FISHERIES MANAGEMENT

An alternative approach is clearly needed, one which is precautionary in nature. It must be designed to maximize the probability that fish stocks and the environment remain healthy and productive. If it is to have any chance of success, this approach must be robustly applied to the various types of uncertainty previously outlined.

The first step in the creation of such a precautionary approach is the precise definition of the objectives of fisheries management. They must be clearly and unambiguously stated in order to avoid confusion over what management is expected to achieve and whether or not the objectives are actually being met. This will be a political process involving a wide range of interests, including the fishery, government, local communities, and environmental organizations. Among the objectives that are established, primacy must be given to those organizations that are geared towards conservation of both the fish stocks and the marine environment. One conservation objective should be to keep the stock at a high level of abundance, relative to what it would have been had there been no fishing, though the appropriate level would vary according to the stock being fished.

Once the objectives have been agreed upon, a procedure must be developed for determining the management measures that are to be imposed upon the fishery in various circumstances. Such a procedure forms a feedback loop and comprises:

- the collection and analysis of data (from the fishery and independent surveys);
- an assessment of the stock's status; and
- decision rules for setting the management measures (e.g., TACs and effort controls).

It is not enough to simply set up a procedure in this way and assume that it will meet management objectives. Due to our imperfect understanding of the dynamics of fish stocks and their interaction with the marine environment, such an approach will have a high probability of failing.

Rather, the ability of a procedure to meet management objectives must be evaluated. Its expected performance must be tested, not only under ideal or even average conditions, but also under a wide range of possible scenarios, including fluctuations in environmental conditions and fish recruitment, interactions among species, and the behavior of the fishery. In other words, it must take explicit account of the full range of uncertainties inherent in fisheries management. The most effective way of conducting extensive testing of this nature is through simulation studies.

It is difficult to be certain what will happen to a fish stock or fishery in any given situation. The purpose of the simulation studies is not to predict what will happen in a particular scenario but rather to examine how well a procedure would perform under a range of scenarios. There will usually be several candidate procedures, and the evaluation process will identify those that perform well in various situations. Those that perform poorly can be eliminated. The procedure ultimately selected for adoption should meet the management objectives, including conservation of the stock with a high probability over a wide range of plausible scenarios.

It is important that the evaluation of the procedure be conducted under realistic assumptions about the amount and quality of data that will be available on both the fishery and the fish stock. For instance, if the catch statistics for the fishery are suspected of consistently underestimating the true catch, then the procedure should be tested using a range of catch values to ensure that it is not overly sensitive to inaccurate data.

Account should also be taken of the extent to which the proposed management measures are enforceable and the results of noncompliance with the regulations. If a minimum mesh size is to be used, how likely are

the fishermen to respect that regulation, and what are the consequences of using a smaller mesh size? Will the procedure still meet the management objectives?

The procedure should be designed so that stocks are not put at risk due to poor or insufficient data. Controls on fishing should vary according to the information available on the stock and fishery so that the procedure allows less fishing in cases where the data are old or of poor quality than in situations where better data are available.

The output of the procedure is a clear list of management measures that should be used to regulate the fishery. Because the procedure results from a rigorous testing process to ensure that it maximizes the probability of achieving the stated management objectives, compelling reasons would be needed not to implement those measures. Thus, this approach has the advantage of minimizing the possibility for arbitrary political interference in management.

Enough is known about the cod fishery in the North Atlantic that management procedures could be developed and implemented relatively easily. This is true for most other fisheries in the region. There will be situations, however, where not enough information is available to determine the probable impact of exploitation so as to develop such procedures. In these cases, exploitation should be limited to an extremely small percentage (around 1 percent) of the estimated biomass. If even a minimum estimate of biomass is not available, no commercial fishing should be allowed at all.

Another important component of a precautionary approach to fisheries management is the way in which the fishing is conducted. Certain gear and practices are more harmful to fish stocks and the habitat than others, depending on the particular situation. In order to prevent damage to the environment, no new fishing method should be deployed on a commercial scale until sufficient research has been done to evaluate its total impact, including by-catch of undersized fish and non-target species and the degree of physical disturbance to the habitat. If the research shows the effects on the habitat and the productivity of the ecosystem to be adverse, the fishing method should not be deployed unless it can be modified to eliminate its harmful effects. Even in the absence of adverse effects on productivity, any fishing method that results in significant disturbance to the habitat should not be allowed in representative closed areas so as to conserve at least part of the habitat in its undisturbed state or allow its recovery if it has been disturbed.

Marine environments are deteriorating in many parts of the world. Pollution is adversely affecting the survival and productivity of fish and other species in some regions; and the occurrence of eutrophic waters and algal blooms are increasing both in frequency and extent while coastal habitats such as estuaries, *mangals* (mangrove communities), and sea grass beds, of

vital importance to many fish species at various stages in their life cycle, are being greatly altered or destroyed. Trends in human population growth, much of it occurring on the coastal zone, strongly suggest that these developments will continue to reduce the productivity of fish stocks; this, in itself, is a powerful argument in favor of adopting a precautionary approach to fisheries management.

Another important component of fisheries management includes consideration of its social and economic impacts. Fish is an important food source, and its importance in this regard to dependent communities must not be ignored. For instance, fisheries that supply food for human consumption or waste less of the fish that are caught should be favored. Policies and government subsidies that encourage the buildup of fishing capacity beyond what is needed to catch the available fish should be discouraged.

There is nothing to prevent the development and adoption of such a precautionary approach to management for the various cod fisheries across the North Atlantic and for other fish stocks. The current state of most cod fisheries clearly shows that such an approach is necessary.

The crisis should be viewed as an opportunity to fundamentally reform the management process, pull back from the brinkmanship that has characterized fishing for so long, and at last put fishing on a conservation basis.

All that is needed is the political will.



FISHERIES MANAGEMENT IN AN OVERUTILIZED OCEAN

Clem Tillion

Unrestricted trawling and wasteful harvest have reduced productivity of our world oceans to but a shadow of their true potential. The North Pacific, the last fishing frontier, currently has healthy stocks, but healthy fish stocks alone do not make a healthy fishery.

The “tragedy of the commons” will guarantee an economic misuse of the resource. Think of what the long-range production oil fields would be like if, instead of a lease system that guarantees exclusive use of an area, any nation’s citizens with means to finance a platform and drill for oil were allowed to come near a producing well and drill another well! The thought itself seems idiotic, but that was the system used only a few decades ago and, sad to say, is the system still in use over much of the world for the management of fisheries.

When Alaska was a territory of the United States prior to 1959, all decisions on resource issues concerning fish, minerals, or timber were made in Washington, D.C., several thousand miles away. By 1958, our salmon runs were but a shadow of the size they had been when the United States purchased Alaska from the Czar of Russia in 1867. In short, in a land where the local population was dependent on their natural resources, distant management or colonial rule was not working well. Therefore, when statehood was offered to Alaska, the management of our living resources was the crown jewel of the benefits we, as a state, were to receive. An initiative was put before the citizens of the territory of Alaska, and they voted to become a state and simultaneously adopted a state constitution.

Among the first laws passed were those giving management biologists almost dictatorial powers over the fisheries and rehabilitation of their individual areas. Other laws gave our courts the power to punish those who took undersized crab or violated salmon regulations. Vessels were seized, and fines were heavy. In one case, a million dollars was assessed against a vessel for its second offense of harvesting undersized crab. Other laws even made it possible to fine the parents of a child who took salmon from a stream closed to salmon fishing.

In our largest population area, Cook Inlet (south of Anchorage), a fifteen-year moratorium on the taking of *chinook* (king salmon) by both sport and commercial fishermen was instituted. The tough part came ten years after the moratorium when people could see all the fish returning and were still not allowed to harvest them. Lodges dependent on sport fishing went bankrupt, and fishermen lost a major portion of their season's catch.

When the fishery opened again there were still too many fisherman chasing too few fish, so a constitutional amendment was proposed that would limit entry into the fisheries. Some Alaskans, unsatisfied with how the right to fish for salmon had been allocated, gathered enough signatures to bring before the public an initiative to repeal the limited entry law, but, on a margin of three to one, the Alaskan people voted to keep it. The limited entry regulation has been in force for twenty years, since 1973, and for the fishermen of Alaska, the buying and selling of the right to fish is so natural it is hard to understand why the passage of the legislation was so bitterly contested.

In almost every area, salmon fishermen have voted to tax themselves above and beyond the state taxation rate to support aquaculture and rehabilitation programs that they also administer. Alaska's salmon runs are larger today than any on record since Alaska came under the U.S. flag. This does not mean there are no problems. For example, there are allocation and mixed-stock interception problems, but few people object to the conservation ethic or limited entry, and many Alaskans recall with fondness one governor who addressed his area managers by saying, "Gentlemen, if you allow an overescapement, expect to be criticized, but if your management decisions result in an underescapement to the spawning grounds, expect to be fired."

When the United States at long last extended jurisdiction to 200 miles off-shore, the U.S. Fisheries Conservation Management Act divided the coastal waters into eight regional councils—three on the Atlantic Coast, one in the Caribbean, one on the Pacific Coast, one off the Alaskan coast, and one in the western Pacific Ocean. The North Pacific Fisheries Management Council manages the harvest of over 50 percent of the fish landed under the Ameri-

can flag. The council has eleven voting members, most of whom are chosen by the U.S. Secretary of Commerce from a list of names submitted by the governors of the affected states. Congress wisely removed any conflict-of-interest restrictions so that those actively engaged in the fisheries managed by this group could serve.

When the council first met in 1976, it chose Anchorage, Alaska, as its headquarters. The choice was made for the convenience of a central point with major airport links throughout the state, for Alaska spans several time zones and has few roads.

The council's first chairman was not a scientist or fisheries manager, but president of Alaska's largest bank and a man with deep roots in the state and a long-term view of its economy. Elmer Rasmuson, the son of a Swedish missionary turned banker, was close to seventy years old when he was bestowed the chairmanship of the council. His stated policy that good fisheries management, like good banking, requires large reserves has not changed with his retirement; the council still holds back approximately 35 percent of its total allocation to assure that in the mad race to harvest short-lived species, some of the long-lived species within this complex are not destroyed.

Alaskan fish stocks are in good condition, but Alaskan fisheries are in trouble, and therein lies the next battleground. Good stock condition is only the basic foundation that must be achieved to make step two possible.

The council's goal is, and should be, to give the public a quality product at a reasonable cost. As long as our fishery managers are given only some of the tools needed to attain this goal, the management system will fail. To give to a manager only the ability to set gross tonnage will result in ever shorter seasons and poor quality. To address only gear restrictions will reduce efficiency at a cost to the public.

With a growing number of vessels fishing on a common pool, the mad race to catch will result in massive waste. Alaskan fisheries waste 150,000 to 200,000 tonnes of fish each year because the fishing fleet is racing for the high-value product.

Without individual vessel shares for each fishery, the incentive to maximize the value of all fish landed does not exist. Without some individual reward in the future, who can forego today's profits to ensure a larger return tomorrow?

The arguments about individual freedom should never be used as an excuse to plunder the sea. Without some system of individual responsibility and reward, the system will fail. Who can afford to slow down and maximize the return for every species?

The North Pacific Fisheries Management Council has embarked on an individual transferable quota program for our long-line fishery, which in-

volves dividing the catch into three categories—(1) vessels under 35 feet, (2) vessels under 60 feet, and (3) vessels over 60 feet—and allocating individual shares on past landings. The shares are a property right and as such are saleable and subdividable, but only within particular vessel size categories. Ownership is further limited to those who are part of the crew aboard at the time of harvest, and there is a 1 percent ownership cap.

In many ways, this is similar to the system used off Canada's British Columbia coast, in which community development quotas (CDQs) are used. A CDQ sets aside 7.5 percent of the Bering Sea pollock stock primarily for the benefit and use of the aboriginal peoples along the Bering Sea coast.

The villages eligible under the CDQ program formed five corporations, and the governor of Alaska, with the concurrence of the U.S. Secretary of Commerce, allocated shares of this 7.5 percent (approximately 100,000 tonnes of fish) to the corporations based on their proposals for the use of the funds. Welfare programs are prohibited, and the funds are required to be used for fishery-related expenditures. In some cases, however, sewer and water projects for existing fish plants, training scholarships, boating upgrades, and other projects are awarded.

As the CDQ shares were not based on the same seasons as the common-property fishery, the village recipients were able to contract a fixed amount of product from each vessel. The result soon became apparent. Because vessels involved in the CDQ fishery no longer rushed out for high volume, they were allowed more time to harvest their share, and they consequently spent more time prospecting for larger fish. Smaller fish that would have been discarded were sorted, and the machinery was adjusted to process them. Other species of lower value were utilized because the vessel could now stop to make a delivery without fear of the quota being taken by another vessel. The profit per tonne of fish increased considerably.

The new system requires weighing all fish, discarded or otherwise, and government observers are required to supervise this task. Alaskans are not only determined to save the biomass but to curtail, in so far as possible, the waste. As the world population grows, it is necessary to keep in mind that the production of fish for food is an obligation and a source of employment and well-being for coastal peoples.



DEVELOPING THE NATURAL RESOURCES OF THE BARENTS REGION: OPPORTUNITIES AND DANGERS

Vladimir Kalinnikov and Anatoly Vinogradov

The industrial development of northern regions is a common world tendency. In Russia, the population in the North recently exceeded 10 million inhabitants. The economic structure of developed areas is based on the natural resources in the Arctic. More than one hundred fifty enterprises are functioning there, and some of them are the largest in Europe. For example, the company Apatite in Kivovsk mines and processes apatite and nepheline, and the company Severonickel in Monchegorsk smelts copper-nickel.

As estimated, less than half of the available natural resources are used nowadays, so the region has a good potential for further extractive enterprises. The Murmansk Region is now the most industrially developed and urbanized region in the circumpolar area. During the twentieth century, it has been the most dynamic region in industrial development. Unfortunately, this positive tendency can have harmful effects on the Arctic environment if the current strategy in raw-material use is not changed.

Northern ecosystems are usually near the limit of sustainability. They easily undergo irreversible changes under anthropogenic impact. The ecological capacity of the northern area is strongly restricted in spite of enormous territories that are not used. It should be emphasized that a disturbance of the northern ecosystems produces a global change in climate and oxygen-carbon dioxide balance owing to the southward shift of the forest and permafrost boundaries and reduction of northern marsh activity in carbon dioxide bio-extraction.

Uncontrolled growth of population and expansion of industry in the North brings unwanted ecological aftereffects. That is extremely evident, for instance, in the Murmansk Region.

NATURAL RESOURCES OF THE MURMANSK REGION

Owing to a great variety of valuable raw materials on the Kola Peninsula and surrounding seas, mining and fishing have become the predominant sources of income here. The region produces up to 18 percent of fish products, about 70 percent of phosphate and ceramic raw materials, 75 percent of various mica, eight percent of iron ores, and a good portion of aluminum, copper, nickel, cobalt, and rare metals manufactured in Russia. Several oil and gas deposits have been found on the Barents Sea shelf. Large reserves of alumina, zirconium, tantalum, yttrium, lithium, caesium, precious metals, molybdenum, and niobium are still waiting to be exploited. Unfortunately, an abnormal enrichment in mineral resources hides in itself a danger for the environment.

POLLUTION OF THE BARENTS REGION ENVIRONMENT

Solid Wastes and Geophysical Disturbances

Mining enterprises output more than 150 million tonnes of ores and produce more than 300 million tonnes of crushed wastes and tailings annually. The intense disturbance of the geophysical environment around huge pits provokes local technogenic earthquakes with magnitudes up to 4.5.

Air Pollution

Metallurgical enterprises, heat power plants, and transportation emit harmful pollutants into the Arctic atmosphere. In the Murmansk Region, annual emission is estimated at 836,000 tonnes, including solids: 71,000 tonnes of sulphur dioxide, 568,000 tonnes of carbon monoxide, 144,000 tonnes of nitric oxides, and 24,000 tonnes of hydrocarbons. Main emission contributors from the stationary sources are the nonferrous enterprises (78.4 percent), power plants (6.6 percent), military forces (5.3 percent), public services (2.3 percent), agrochemistry (2.3 percent), and transportation (14 percent). In the Archangel District, annual emission is around 550,000 tonnes, mainly from heat power, cement, and pulp plants. Heavy metals, chlorine, and formaldehyde are the most toxic components of local industrial emissions.

POLLUTANT AGENT	NORTHERN EUROPE	WESTERN SIBERIA	EASTERN SIBERIA
SO ₂ (million tonnes)	1.1	0.7	2.7
H ₂ SO ₄ (million tonnes)	0.7	1.1	30.7
NO _x (million tonnes)	0.14	0.52	0.17
H ₂ S (million tonnes)	0.02	0.03	0.07
Pb (tonnes)	2.1	42.0	45.7
Hg (tonnes)	0.16	1.1	3.14
Benzopyrene (tonnes)	0.26	2.2	0
TOTAL (million tonnes)	3.2	4.7	4.5

TABLE 1: Annual Emissions into the Northern Russia Atmosphere from Fixed Sources in 1990.

The total output was estimated in 1989 as follows: nickel, 3,400 tonnes; copper, 2,400 tonnes; chlorine, 400 tonnes; sulfuric acid, 200 tonnes; and formaldehyde, 600 tonnes. The tendency of an emission increase is observed, and in 1990, total pollutant generation grew 5 percent.

It is necessary to emphasize that the same high level of air pollution is typical for all northern territories of Russia (see Table 1). Moreover, in the Siberian atmosphere, the scale of pollution by the most toxic components (lead, mercury, and benzopyrene) is higher than in the European North.

Water Pollution

Enterprises and towns situated on the Kola Peninsula put out a lot of waste water. In 1989, the total volume of effluents into the regional terrestrial water basins was 2,389 million cubic meters; 103 million cubic meters of them were nonpurified, and a further 256 million cubic meters were insufficiently purified. The total annual content of adverse compounds in sewage is estimated at 272,000 tonnes (including nickel, 144 tonnes; copper, 4.5 tonnes; fluorine, 124.5 tonnes; and oil, 159 tonnes). The output of the Archangel District is four times less and is estimated at 640 million cubic meters. The river runoffs are 71 cubic kilometers in the Murmansk district and 372 cubic kilometers in the Archangel District, so the latter has more possibility for self-cleaning in comparison to the former.

Regional industrial effluents, together with fallouts from local and international air flows, have made essential changes in the hydrochemical regime of the largest lakes of northern Europe, located on the Kola Peninsula (see Table 2). Before urbanization, the Kola lakes contained extremely clean fresh water, but now the lakes at the industrial centers contain up to 300

PARAMETERS	PRIMARY NATURAL BACKGROUND	ZONES CLOSED TO METALLURGICAL PLANTS	ZONES CLOSED TO APATITE MINING
Total Mineralization	17–24	90–210	96–100
Sulfates	3	29–105	28–43
Suspended Substances	0.5	2–30	2–45
Toxic Organic Agents	0	0–1	0–0.7
Heavy Metals	2	3–200	3–10
Fluorine	0.15	0.15	0.1–10
Phosphorus	1	1–110	10–300
Nitrates	1	10–30	10–3,800

TABLE 2: *Hydrochemical Features of Water in the Kola Lakes Affected by Technogenic Stress (in milligrams per liter).*

milligrams per liter of salts (including 105 milligrams per liter of sulfates) and up to 45 milligrams per liter of suspended matter. As a result of technogenic impact, the fluorine concentrations in water increased to 10 milligrams per liter, and toxic heavy metals such as nickel, copper, and sulfur oxide exceeded the critical loads by 100–400 times.

Radioactive Pollution of the Barents Sea

Now is the time to discuss the problems of international radioactive pollutants in the Northern Atlantic, which is the main fishery region for Russia and Norway. The mass media and public opinion usually correlate this type of pollution with nuclear testing on Novaya Zemlya or with the Chernobyl accident. But the latest joint investigation shows that the highest pollution by radiogenic cesium-137 is near the shores of Norway and not near the Russian coast. This is a result of systematic disposal of radioactive waste waters from radiochemical plants, located on the shores of France, England, and Scotland. The Gulf Stream transfers all the “dirt” to the fishery zone, which can accumulate in fish and mollusks. Information concerning radioactive-components distribution in the ecosystems of the Barents Sea is not profuse, but it is enough to cause anxiety in far-sighted prognoses. It is time for deeper research and analysis of the radioactive pollution problems spreading in the transborder water streams. Obviously, the efforts of the whole of European society are needed to find an effective solution.

Oil Pollution in the Arctic Seas

Problems of water protection in cold-climate regions are far from being solved. This is true for both the Northern Sea region and Alaska. For the

Barents and White Seas, where there is practically no oil extraction yet, this wouldn't be a high-priority issue if there were no Gulf Stream, Northern Sea Route, or good prospects for oil and gas development and extraction on the Barents shelf. In Gulf Stream water, the content of dissolved oil hydrocarbon compounds varies between 60 to 90 milligrams per liter; the value of natural background in pure ocean water is not more than 0.01 milligrams per liter. The abundance of undissolved oil balls transported by the Gulf Stream reached up to 7 milligrams per square meter. In the zones of the Gulf Stream that disappear within the Barents Sea, the water is contaminated by hydrocarbons up to 1.5 milligrams per liter and in some closed bays by up to 31 milligrams per liter. The dissolution of oil is promoting the contemporaneous pollution of water with different chlorine-organic compounds and detergents so that in the frontal zone of the North Atlantic stream, the abundance of these compounds sometimes exceeds 200 milligrams per liter, and detergents reach 1,200 milligrams per liter. (For comparison, the background content in clean water is less than 1 milligram per liter.) In the future, exploitation of shelf oil deposits in the Barents Sea could cause accidents similar to that of the *Exxon Valdez*, so it is time to start protecting these waters.

It should be noted that oil pollution in the Arctic will be far more difficult to handle than in warmer regions in the Atlantic and the Pacific oceans. This happens because the natural marine ecosystem's ability to self-purify is reduced at low water temperatures. At 25 degrees Celsius, an oil film on the sea surface can be oxidized and destroyed within one to two weeks, while at 5 degrees Celsius, this process can take six months. In below-zero Arctic temperatures, an oil film may remain on the water surface for decades.

Why is oil film dangerous? First, it diminishes by 50–90 percent the gas exchange on the ocean-atmosphere boundary, thus worsening living conditions for all oxygen-consuming forms of biota. Second, as Norwegian scientists have proven, heavy oil components are highly toxic. At concentrations of 1–5 parts per thousand, 50 percent of cod eggs die, and the surviving embryos and larvae are seriously affected.

Discharged Fleet and Platform Pollutants of the Barents Region

Relatively rare catastrophes divert public attention from the small-scale but chronic pollution of seas by oil-containing discharge waters from ships and drilling platforms. "Regulation" of the amount of such effluences by law only creates a seeming well-being. According to international conventions on sea law, tankers are allowed to drain 60 liters of discharge water per mile starting just 12 miles off the coast. English platforms in the Northern Sea are permitted to dump water with an oil concentration of 40 grams per tonne,

which amounts to 1,430 tonnes of oil drained into the sea over a five-year period. Thousands of fishing boats add 10–20 tonnes of oil products to the Barents Sea. The total polluting effect of “normally” (i.e., legally) operating fleets and drilling platforms is comparable to a large accident or natural disaster every year. Consequently, further efforts are necessary to improve all ship’s and platform’s effluences purification.

Environment Pollution and Human Life

The urbanization of the Arctic has changed the northern environment and caused the loss of some national traditions in an ecologically balanced economy. In the Arctic, compared with the Temperate Zone, the negative influence on human health from both the extreme climatic conditions and physical processes in the magnetosphere of near space is intensifying many times. A large number of newcomers have difficulties with adaptation, especially when chemical pollution of the environment in industrial areas has passed the limits of admissible safe values, and the death rate has grown two to five times in comparison to similar regions in the Temperate Zone. In the Archangel District during the last twenty years, the number of affected people exceeds the average for the Russian Federation by 12–15 percent. The average lifetime of inhabitants in the Russian Barents Region is significantly less than in Scandinavia.

Mining and Metallurgical Wastes As a Source of Arctic Nature Contamination

Mining and metallurgic enterprises form the major part of the technosphere in the Barents Euro-Arctic Region. There is a common opinion that they are responsible for the large-scale pollution of the Arctic with heavy metals and other dangerous contaminants (see Tables 1 and 2). As to emissions from smelting plants, the conclusion is evident and proven, but the real share of mining activity in hydrospheric and the atmospheric contamination of the Arctic has not been estimated. A simple example will provide an illustration of the volatility of mining projects. Before mineral extraction, rocks do not have any features as “polluters” of the environment, even when the content of potential pollutants is high, because the chemical exchange between solid mass and hydrosphere is restricted. After their crushing and transfer into water-penetrated dumps, however, the chemical reactions of rocks increase many times and some trace or accessory components appear as polluting agents.

For instance, in the Lovozero mining area in central Kola the wall rock hosting the titanium ore bodies contains up to 10 percent of water-soluble fluorides (e.g., sodium fluoride). Before mining operations began, the lakes

in the surrounding Lovozero massif area were free of fluorine. But after twenty years of mining activity, the fluorine concentration in Lovozero Lake has increased to 10 milligrams per liter. In the largest lake of the European North—Imandra Lake—the salt contamination has increased two to three times under the influence of apatite-nepheline mining enterprises. Both above-mentioned lakes are the main sources of fluvio-tributaries to the White and Barents Sea basins.

THE PRINCIPLES OF WISE MANAGEMENT FOR SUSTAINABLE DEVELOPMENT OF THE BARENTS EURO-ARCTIC REGION

Taking into account all the factors listed above and issuing from seventy years experience of Kola Region industrialization, five basic principles for rational utilization of Arctic natural resources could be suggested:

1. restrict industrial activity in the Arctic to enable the extraction and nonwaste processing of only those resources that cannot be satisfied by non-Arctic sources;
2. prohibit industrial activity that causes critical impacts on the local ecosystems and regenerate disturbed natural landscapes afterwards;
3. manage the population migration to minimize the influx of able-bodied workers to the North and to provide optimal conditions for resettlement of the disabled population to the Temperate Zone;
4. preserve the ratio between disturbed and undisturbed territories to keep a stable ecological balance in the region and preserve both natural genetic foundation and biological variety, and to provide development of traditional economies by indigenous peoples; and
5. develop an ecologically harmless, resource-saving energy supply.

As a first step along this endless path of transformation from presently a harmful technosphere into the ideal “Arctic Noosphere,” a conversion of useless wastes into effective cleaning agents or profitable harmless products might be implemented in the Barents Region.

A REMEDY FOR NORTHERN ENVIRONMENTAL PROTECTION

There are some ways to diminish the negative influences on the Arctic environment. Traditionally, all attempts were focused on the all-around utilization of poly-component ores. A new approach is to transform the tailings and slag wastes into "cleaning" materials (e.g., absorbents and coagulants) or building materials. The Kola Science Center offers different advanced technologies to convert industrial wastes into valuable goods for tackling environmental problems in the Barents Euro-Arctic Region. An integrated approach to Kola minerals exploitation will yield a series of valuable materials for tackling environmental problems.

Vermiculite Adsorbents Used as Protectors against Arctic Oil Spills

One of the promising directions in combating oil spills seems to be the removal of "chocolate mousse" (an oil-aqueous emulsion) by adsorption-active materials having high oil capacitance and buoyancy and that are environmentally harmless. The Kola Science Center has been developing such materials for a number of years now. Having tested a variety of adsorbent types, we have concluded that the best adsorbents are based on vermiculite. Vermiculite is a kind of mica that, when calcined, increases twenty-fold in volume, porosity, and inner surface area, thus ensuring high buoyancy. Natural vermiculite occurs in soil in many regions, but large economic deposits are known only in South Africa and in the Murmansk Region. The Kovdorsluida mining enterprise is exploiting reserves that are large enough to cover future work requirements in raw materials for adsorbents production.

At the Kola Science Center, a new adsorbing agent with excellent buoyancy and oil capacitance, called *c-verad* has been synthesized (see Table 3). *C-verad* is an effective oil collector not only in the summer, but also at low ambient temperatures. In 15–30 minutes, at 0 degrees Celsius, each

GRAIN SIZE (MM)	BLACK OIL BINDING ABILITY	MACHINE OIL BINDING ABILITY	DIESEL OIL BINDING ABILITY	TOLUOL BINDING ABILITY	BUOYANCY (DAYS)
-8 + 5	1.9	1.1	1.0	1.0	8–14
-5 + 2.5	2.4	2.9	2.2	2.2	4–6
-1.25 + 2.5	4.3	3.7	2.9	2.9	1–3
-1.25 + 0.63	6.1	3.9	4.1	3.9	0.5–1

TABLE 3: Buoyancy and Capacitance of *C-Verad* (as to Granulometric Sorts).

SAMPLES	OIL OXIDIZING BACTERIA CONTENT (MG/G)	DECOMPOSITION COEFFICIENT OF OIL PRODUCTS (DAYS)
Thermally Treated Vermiculite	15.35	42
C-Verad	18.2	31

TABLE 4: *The Results of Vermiculite Bio-Adsorbent Testing (at 0 degrees Celsius).*

gram of c-verad is capable of collecting 1.2–3.1 grams of oil product. The smaller the adsorbent particles are, the faster they absorb pollutants. Water purification may be increased noticeably by applying bio-activated adsorbents. However, at present, commercially produced preparations (of “Putidoil” type) are capable of operating with oil-oxidizing bacteria strains only at temperatures over 10 degrees Celsius and are unsuitable for Arctic waters. The Kola Science Center has searched for Arctic forms of bio-oxidizing bacteria and has succeeded in creating collections of strains that can vigorously decompose a wide range of oil products at low temperatures and that are easy to commercialize. As microorganisms, substrata ceolite, perlite, burned clay, and vermiculite were tested, the best results were obtained from thermally treated vermiculite and c-verad. Both adsorbents possess all the properties necessary to maintain bacteria in substrata: they are insoluble in water, have high filtering ability and macroporosity and large specific surface areas, and are chemically and biologically resistant. Experimental lots of bio-adsorbing agents created on the basis of vermiculite and c-verad were tested at 0 degrees Celsius in a medium whose composition approached that of sea water with the addition of crude oil (oil content—10 milliliters per liter of water). The bio-adsorbent was used in the ratio of 10 gallons per liter of oil-containing solution. The outcome is shown in Table 4. The briefly outlined results form a sufficient basis to start large-scale production of adsorbents and create reserve funds for protecting potentially hazardous Arctic areas. Such a preventive measure would enhance transportation and oil-extraction safety in the region and make it possible to drastically reduce the number of accidents.

Vermiculite Filters Used to Purify Ship-Discharged Water

Filtration of oil-containing discharge waters through a stationary layer of c-verad diminishes pollutant concentration by 75–99 percent. The filters preserve high adsorption capacitance even at 5 degrees Celsius. The highest

filtration rate is achieved when medium- and coarse-grained types of adsorbent are used. Adsorption capacitance of c-verad for emulgent products is 8 grams per kilogram of adsorbent. The used filter media are replaced by new portions of c-verad while the used adsorbent is thermally regenerated at 600–650 degrees Celsius.

Thus, c-verad could resolve a number of ecological problems in the Barents Region such as the removal of oil pollutants during emergencies and ship and platform maintenance.

Tailing Dumps as Technogenic Mineral Deposits

Traditionally, industrial wastes were considered only as useless pollutant agents. But recently developed chemical technologies have made it possible to regard them as a new class of raw materials, the so-called technogenic deposits. The nepheline-bearing tailings of the Apatite company near Apatity contain 550 million tonnes of sands that comprise the best nepheline “ores” that can be used successfully. The bulk of the tailings is formed by nepheline containing such valuable components as aluminum (Al_2O_3 ; 28 percent), sodium, and potassium (20 percent). The Kola Science Center has proposed a nitrogen-acid method for processing both nepheline concentrate and the tailings of apatite floatation, making it possible to produce as much alumina, potassium carbonates, sodas, phosphorus-potassium fertilizers, amorphous microsilicas, potassium-sodium nitrates, and coagulants as needed for the Barents Region and Northern Russia. In this way, the waste output and pollution of Imandra Lake will also be minimized.

Using secondary raw materials from technogenic sources in Murmansk will increase the total industrial output with marked improvement of the ecological situation. Use of tailing dumps is an alternative strategy that allows further expansion of a northern technosphere and protection of northern nature.

Summing up this brief analysis of the modern situation and perspectives for techno- and biosphere development in the Russian part of the Barents Region, we can state with confidence that the scientific base and technological potential exist for restricting the negative effects induced by one of the largest polluters in the Arctic region—the Kola mining and metallurgy complex—in the near future, and for drastically improving the ecological situation in the Barents Euro-Arctic Region. But time for decision making is rather limited. The style of natural-resource management and the human-nature relationship need to be changed today, because tomorrow it will be too late.



REGIONAL DEVELOPMENT IN THE RUSSIAN FAR NORTH

Victor Mikhailov

The Northern Zone of Russia covers of 11.2 million square kilometers of territory (two-thirds of the territory of Russia) and includes different territories such as federal republics, autonomous regions, oblasts, and administrative territories. The natural resources of the North are the main source of resources for the entire country. The population of the Northern Zone as of January, 1993, was 9.7 million people, which is 6.5 percent of Russia's entire population of 148.6 million people. In addition, the Northern Zone has fully determined, over the last several years, the volume and growth in production of oil, gas and coal, some types of raw minerals, essential timber, and marine products.

Northern resources are important resources for Russia. The North accounts for 10 percent of the industrial production of Russia, 92 percent of the gas, 75 percent of the oil, and a large part of gold, diamond, silver, tin, and other mineral resources. In 1992, exports of northern natural-resource products amounted to 53 percent of all Russian exports. The North provides 20 percent of the Russian national income.

But the intensive mining and quick exploitation of the most readily available and accessible mineral deposits and other natural resources, and the politics of fast economic and social reforms, have raised the cost of utilizing raw materials. A noticeable decline in effective production has been observed in almost all the northern regions. For example, the extraction of oil and gas-condensate was down from 390 million tonnes (2.9 billion bar-



*Dying trees near Norilsk. Taymyr, Russia. Project 9E0077.
(Photo by WWF/Peter Prokosch.)*

rels) in 1986 to 260 million tonnes in 1992. Northern coal production fell by 22 percent in 1992, and fish production fell by 13 percent.

This situation in the northern industrial complex has intensified emigration from the region. The total population of the Russian North fell by 0.8 percent in 1991 and by 1.5 percent in 1992. There were large territorial differences in emigration, with the highest rates occurring in the Tyumen, Magadan, and Murmansk oblasts and in the Saha (Yakutia) and Komi republics. Net natural population growth has fallen too.

The declines in the industrial production and in the population of the North are not positive indications for northern regions. They must be stopped.

The state government has moved to regulate this problem through a resolution of the Congress of Russian People. The North of Russia program's immediate task is to stop the industrial and the population decline of the North.

The situation of native peoples is complex, involving some 181,500 people in twenty-six groups. Seven native populations have autonomous state structures. The new (nonnative) industrial population is 1.7

million in the regions where these native groups live. The death rate for natives is higher than the population as a whole due to accidents, poor nourishment, trauma, and heart disease (which accounts for one-half of all deaths in the region).

The intensive development of natural resources without necessary governmental control led to the disruption of the natural ecosystems of the North and, in some areas of development, caused serious and irreversible results. For example, the use of heavy machinery, strip mining, and other technologies not adapted to the ecosystems of the North led to the degradation of more than 7 million hectares of reindeer pasture. The North of Russia Program will contain special recommendations for issues affecting native peoples and ecological problems.



WEIGHING THE NEEDS OF ENVIRONMENTAL MANAGEMENT AND ECONOMIC DEVELOPMENT— THE CHALLENGE FOR PUBLIC AUTHORITIES IN THE ARCTIC

Paul Fubs

People are a normal part of the Arctic ecosystem, and we can view them in one or several of four ways: (1) as predators such as hunters and fishermen who eat food from the land and sea, which is part of the Arctic culture; (2) as prey, where unsuspecting humans are eaten by bears or overcome by the harsh environment; (3) as protectors of wildlife and habitat, being the only animals to think for the future in this way; or (4) as producers of resources, creating materials and jobs.

In Alaska, we are proud of being net exporters of materials to other regions. We consider it strange when our regional people are thought to be an exotic part of the landscape and not as essential elements of it. Our environmental policies correct past mistakes and guide us to the future. In fact, we can't imagine wilderness as devoid of people. This is an alienated approach.

In Alaska, less than 0.5 percent of the land is developed, and even if all development proposals were acted upon immediately, only 1 percent of the land would be developed. North of the Arctic Circle, 57 percent of the Arctic is already declared as wilderness.

We sometimes think that further wilderness declaration is a panacea for people in the South who won't change their own destructive or overconsumptive lifestyles. We also think that people in the South view people in the Arctic as expendable, with fewer rights than the tourists who come to visit. And, above all, we feel that people in the South often have contradictory views about the environment of the North and its peoples; for

example, they support wilderness for indigenous peoples, but don't allow their trade in sea mammals or walrus ivory. We view indigenous peoples not as artifacts, but rather as people who need jobs, conduct politics and business, and need improved conditions, like anyone else. We also feel that additional wilderness designations in the Arctic can work against their best interests.

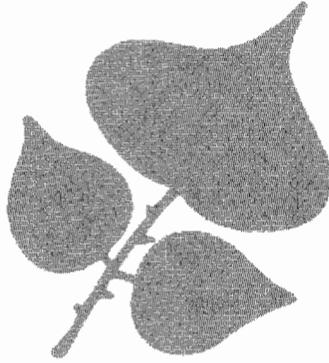
Oil production is an important part of Alaska and of America. If we don't produce oil in Alaska, then such production is simply pushed off to other, less environmentally aware countries. Alaska has some of the most important aspects of oil production, such as good production regulations and good reclamation afterwards. Poorly regulated agriculture and housing development have done far more damage to the environment than oil production. However, the question remains: Must we practice "environmental elitism" by simultaneously not decreasing our demand for oil and by not allowing it to be produced in our own country?

Besides oil production, Alaska helps the South with many other things such as the reclamation and reintroduction of moose, deer, and other wildlife. Alaska produces 15 percent of the world's fish proteins, as well as other raw materials for plastics, steel, fuel, artificial fibers, and more. We think one of the problems is that people in the South are so divorced from the production of natural resources that they don't realize where things come from or what it takes to extract them.

Certainly, we need to recycle more, change conspicuous consumption, and (most importantly) practice population control. The key to population control is a good, strong economy. Protecting the environment is expensive, and it needs a strong economy.

Alaska has a strong commitment to the balance between environmental protection and economic development. We've helped clean up radioactive and military nuclear waste in Russia, pioneered oil cleanup, passed the Forest Practices Act to protect marine habitat, and were part of the U.S. Energy Council, pursuing the important issues of conserving energy, developing alternative fuels, and enacting strong regulations. The Alaskan government also has preference for recycled products, and we led the fight against high-seas drift-net fishing. Furthermore, Alaska has a model indigenous whaling program.

Section IV



**GREEN LEAF
AWARD**



THE GREAT ARCTIC RESERVE— TAYMYR PENINSULA

Rakel Surlien

The Green Leaf Award is awarded to an individual, organization, or institution that has contributed significantly to wilderness conservation through environmental protection, habitat restoration, sustainable development, or cultural and philosophical activities. It has been awarded once before—at the 4th World Wilderness Congress in 1987. On that occasion, the recipient was the Ministry of Forestry, Peoples Republic of China. The award was given in recognition of their work in reforestation and environmental restoration in rural areas. I would like most sincerely to thank Dr. Ian Player, Founder of the World Wilderness Congress (WWC), for giving the Governing Board of the 5th World Wilderness Congress the honor of selecting the recipient of the Green Leaf Award on this occasion.

The theme of the 5th WWC has been *Wild Nature and Sustainable Living in Circumpolar Regions*. For eight busy days, we listened to lectures and discussed with friends and colleagues many aspects of conservation and commerce, law and management, and philosophy and politics as they concern the wild places of our planet Earth. Mentally, we traveled from the South to the North Pole, and, on the way, we touched many countries and states. But, for the most part, we concentrated on life at high latitudes.

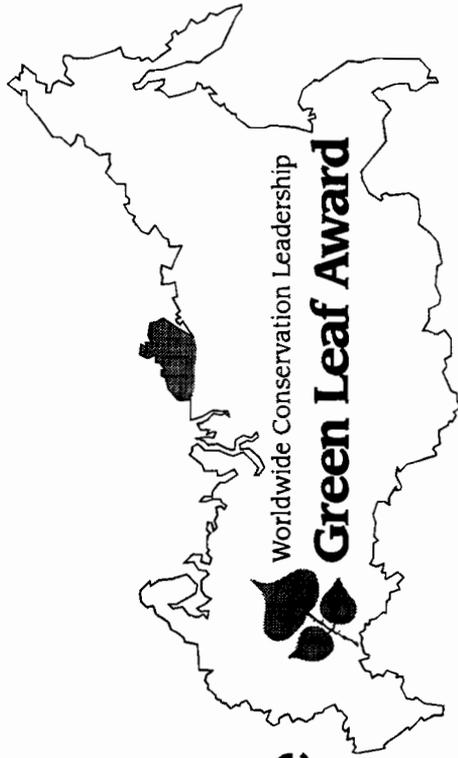
For this reason, the Governing Board decided early in its deliberations that the winner of the Green Leaf Award should be found within circumpolar regions. This decision, ladies and gentlemen, is intended as a tribute to those who first determined that the 5th WWC should focus on polar regions. These are the cold lands of the Earth, cold lands with a warmth, richness of

Be it hereby known that the

People of Taymyr

have established the

Great Arctic Reserve



In so doing, they have demonstrated outstanding Worldwide Conservation Leadership

 protecting a vast wilderness area of diverse and important values for worldwide conservation;

 fostering international cooperation with the Worldwide Fund for Nature and others; and

 creating an example that encourages optimism for further nature conservation projects;

and are therefore recognized by the International Wilderness Leadership (WILD) Foundation and the 5th World Wilderness Congress (Norway) with the Green Leaf Award, presented in Tromsø, Norway

24 September through 1 October 1993

Rakel Surlien, Chair
Governing Board
5th WWF (Norway)

Dr Ian C. Player
Founder
World Wilderness Congress

Vance G. Martin
President
The WILD Foundation

You are tired with years of civilization. I come and offer you what? A single green leaf.
Grey Owl, 1934

life, and culture that many of the speakers at this congress have so eloquently described.

The polar regions—the Arctic and Antarctica—have, until recently, remained almost completely unknown to science. In just a few decades, our knowledge of these regions has expanded explosively, but it is still dwarfed by the vastness of these areas. As we learn more about them, so we learn to wonder more at their magnificence. But if we value them, so must we protect them, for the world is such that we can no longer afford to be complacent. Conservation requires action.

The natural environment—the human environment—of the polar regions of the world is today threatened in many ways. It needs protection. Many people—many of you here today—are vigorously engaged in working to protect them.

Hence, when we pondered whom we should honor with the Green Leaf Award, we sought a project that was both important in itself and which serves as an inspiration to all people working for conservation of polar regions.

It is in recognition of this that I have the pleasure to confer the 1993 Green Leaf Award to:

The people of Taymyr in Russia and the international team responsible for the combined work that culminated in the creation of the Great Arctic Reserve on the Taymyr Peninsula.

What is the history of the Great Arctic Reserve? In the northernmost reaches of the continent of Eurasia lies a vast expanse of tundra on the Taymyr Peninsula of Siberia. This area of 400,000 square kilometers of wilderness is one of the largest nature treasures on Earth. Russia wants to secure this region for the benefit of future generations of humankind. Its effort in this respect is a landmark in international nature protection.

In July 1993, an area of some 4 million hectares—a region about the size of Denmark—was officially set aside and declared as the Great Arctic Reserve. This reserve has been designated a *zapovednik*. This is a Russian word describing the strictest category of environmental protection. The Great Arctic Reserve is the largest *zapovednik* in Russia.

The idea for the Great Arctic Reserve was conceived in 1989 when, for the first time, an international expedition—German and Russian—visited Taymyr, an area which, at that time, was part of the Soviet Union. Several joint expeditions were subsequently carried out by the Russian Academy of Sciences and the World Wide Fund for Nature (WWF). Considerable support for the project has been provided by the German Federal Ministry for the Environment and the Royal Dutch Government.

The Great Arctic Reserve includes several different land areas, parts of the Kara Sea, and several islands. White whales, walrus, bearded seals, ringed seals, and polar bears live there. A herd of 700,000 wild reindeer also live there and is one of the largest herds of reindeer in the world. But the Great Arctic Reserve is important not only because of large, conspicuous animals like these. It is also a major part of a network of reserves that includes the breeding grounds of many millions of coastal birds.

Ladies and gentlemen, people are as important a part of nature conservation as plants and animals. The Taymyr Peninsula is a vast area. It is about as big as Germany and the Netherlands combined. Approximately 340,000 people live there, the majority, almost 300,000, in the city of Noril'sk. Hardly anybody lives in the northern part of Taymyr where the reserve has been established.

The people of Taymyr are aware of the wilderness value of their region. Accordingly, when from 1991 to 1992 public hearings on establishing the reserve were held in Dudinka, the governor, Mr. Genadi Pavlovitch Nedelin, and all the other decision makers involved, including the authorities of the Autonomous Region of Taymyr and of the Rajon Dickson, readily agreed to and actively supported the idea of the reserve. These people, and all the people of Taymyr, are the recipients of this award.

The Green Leaf Award includes a beautiful statue and a plaque. It is our wish that the plaque be placed in the parliament building of the Autonomous Region of Taymyr. We hope that it will help to stimulate further conservation work in the magnificent natural environment of Taymyr.

The text on the plaque reads:

Be it hereby known that the people of Taymyr have established the Great Arctic Reserve. In so doing, they have demonstrated outstanding Worldwide Conservation Leadership:

- protecting a vast wilderness area of diverse and important values for worldwide conservation;
- fostering international cooperation with the World Wide Fund for Nature and others; and
- creating an example that encourages optimism for further nature conservation projects;

and are, therefore, recognized by the International Wilderness Leadership (WILD) Foundation and the 5th World Wilderness Congress (Norway) with the Green Leaf Award, presented in Tromsø, Norway, 24 September through 1 October 1993.

The text on the statue reads:

The Worldwide Conservation Leadership Green Leaf Award.

To the people of Taymyr for their commitment and vision in establishing the Great Arctic Reserve.

Presented at the 5th World Wilderness Congress, Tromsø, Norway, 24 September through 1 October 1993.

“You are tired with years of civilization. I come and offer you what? A single green leaf.”—Grey Owl, 1934

Many persons have been involved in this project, but I would like to draw your attention, in particular, to four people who have been instrumental in its success. Dr. Jevgeni Jevgenjevitch Syroechkovsky from the Institute for Evolutionary Morphology and Animal Ecology at the Russian Academy of Sciences in Moscow was the partner for the WWF from 1989 onwards in the cooperative conservation research project on Taymyr and the Wadden Sea. He was one of the originators of the idea to create a new reserve in Taymyr. It was he who conceived the name *Great Arctic Reserve*. When support for the project was received from relevant decision makers in Russia and from the public in Taymyr, Dr. Syroechkovsky served as scientific adviser for the WWF in the next stage of the work. He apologizes that he is unable to be here today; he is engaged in scientific work on the Yenisey River.

Andrei Alexeievitch Ivanov-Smolensky, who works for a nongovernmental organization called the Social Ecological Union, managed the logistical part of the project in Moscow from 1991 to 1993. He was able to bring many people—scientists, decision makers, and others—together. His contribution has been crucial to the success of the project.

Victor Vladimirovitch Nikiforov worked on the project from 1991 to 1993 as an experienced planner on Taymyr. He did the main evaluation and planning work and transformed the idealistic ecological views into the pragmatic planning proposals that were finally presented to the Russian authorities. He is now the deputy director of the Great Arctic Reserve administration in Dudinka.

Dr. Peter Prokosch from the WWF (International) in Oslo joined several expeditions to Taymyr and was leader of the project on behalf of the WWF. He has been a catalyst for the project ever since he followed coastal birds from the Wadden Sea north to their breeding grounds on Taymyr. The WWF

has provided considerable economic support for this great project. The Governing Board of the 5th WWC has, therefore, decided that the WWF should be honored separately. Dr. Prokosch is, therefore, asked to receive a plaque on behalf of the WWF. The text of this plaque reads:

Be it hereby known that the World Wide Fund for Nature has helped establish the Great Arctic Reserve:

- protecting a vast wilderness area of diverse and important values for worldwide conservation; and
- fostering international cooperation with the people of the Autonomous Region of Taymyr;

and are, therefore, recognized by the International Wilderness Leadership (WILD) Foundation and the 5th World Wilderness Congress (Norway) with the Worldwide Conservation Leadership Green Leaf Award, presented in Tromsø, Norway, 24 September through 1 October 1993.

Warmest congratulations to the recipients from The WILD Foundation and all the participants at the 5th World Wilderness Congress.

Section V



**SUPPLEMENTARY
MATERIAL**

Symposium Summaries



THE IDEA OF THE WILD

David Rothenberg

Our symposium is one of philosophy, with no demand for consensus or resolution. We set out to determine how much of the idea of the wild lay within and outside us. When I set up the session, I shied away from using the term *wilderness* because I anticipated the difficulty the word would face. What I describe below are the sentiments of the panelists and audience respondents involved in The Idea of the Wild symposium.

We have heard local northern representatives say that wilderness is a foreign concept to them, set up by “urban people” who only want to spend

their free time in nature. We have also heard native people demand that they not be pigeonholed or stereotyped so that they cannot enjoy the pleasures of development that the rest of us have experienced. We have heard others speak of the need for wilderness to be experienced firsthand, or, as Peter Matthiessen wrote of the elusive snow leopard, it may be enough for some to know that wilderness exists and is guaranteed in this world, without the need to ever see it.

One of the few points of agreement in our session was the sense that people mean many different things when they speak of wilderness. In Canada, wilderness usually includes native peoples; in the United States, however, they are often excluded. In Nepal, there is hardly any wilderness below 5,000 meters because people have lived close to the land for centuries. We need to recognize the differences in our understanding of the term before we try to reach some consensus on how to successfully live in wild places.

Our session participants universally opposed use of the term *sustainable development*, which is a slippery term that can be used to define sustaining just about any practice the promoter wants to sustain or develop. We affirmed the right of native peoples to manage their local resources; however, they, like everyone else, must test their specific knowledge against a worldwide environmental crisis. We cannot let support for local cultures disguise nationalism because environmental issues affect all nations and cultures.

Our session participants universally supported use of the term *wild culture*, where nature and humanity are not opposed to each other. We spoke of classical and romantic notions of wilderness, where fear and evil dwell or where we go to escape a "civilized world" and regain our sanity. Both notions are no longer appropriate. The wild will transcend the tame and untamed, the jungle and the city. It will instead refer to our progress towards a culture that can understand nature without hemming it in through management and control. The wild should not be thought of as bad and unruly, and we should not rely on too many rules to define it. We face a challenge to conceive a new kind of civilization, one that does not require the destruction of our world to improve itself. However, we will not find the model for this improvement in the past or present. We must look to the future.

This conference has conjoined the issues of wilderness and development, which I don't believe fit neatly together. I have met many people who are either for destroying the wilderness or for saving it, with little chance of communication between them. It seems that for any communication to take place, we must not think of wilderness and civilization in opposition to one another. Instead, we must think about the wild, from which everything once developed, and see if we can communicate. Take people out there. Listen to the silence. Find a way to live within the wilderness, literally and figura-

tively. We in the developed world must change our way of life—for example, consume less of the wilderness, and sense more of it.

The wild is not just for people; it is also for the nonhuman or more-than-human: the water, trees, plants, and animals. We need to care for more than humanity, especially for those who have not wasted the world.

In addition to science, we also need to use reflection and art in caring for our world. The Norwegian *selfefløyte*, for example, is piece of wild culture to be shared and appreciated. It is a simple instrument, made from a willow stalk wrapped in birch bark. There are no holes for the fingers, suggesting no particular choices to the user. It plays natural overtones like wind ruffling through trees. The music is rhythm and pitch, a dynamic between the player and the played. It is a beautiful offering from this country to the world.

Canadian composer R. Murray Schafer wrote: “The art of the South is the art of excess. The art of the North is the art of restraint.” Hence, it is possible to understand the Greek word *techné*, suggesting the art of *technology* (the systematic treatment of an art).

The following words capture the essence of life in the North:

I am a Northerner.
 My heart is pure.
 My mind is cool as an icebox.
 And the cold of the forest will be in me until my extinction.
 Between me and the North Pole may be a few dozen people.
 But I rarely meet them.
 Mostly I wander alone, making my peace with the northern lights.
 My head is a thousand acres of wilderness.
 At night my imagination howls with wolves.
 But no matter how you cherish the wolf,
 it will always look back to the forest.



INTERNATIONAL WILDERNESS ALLOCATION, MANAGEMENT, AND RESEARCH

John Hendee and Vance G. Martin

The symposium on International Wilderness Allocation, Management, and Research featured forty-eight presentations by seventy-two presenters and coauthors in six sessions. Participants included wilderness leaders worldwide from land management agencies, environmental organizations, universities, and the scientific community from Norway, the United States, Canada, Australia, Russia, the Republic of South Africa, Finland, and Kenya. Some highlights need to be mentioned, although we do so at the risk of slighting some of the many excellent presentations and important topics.

The need to integrate the wisdom and views of indigenous peoples into wilderness allocation and management was a strong theme in ten of the presentations. If asked to select the single most important idea from the symposium, we would say it came from the paper by Bill Overbaugh and Angela West Berger, "Integrating Management of Ecological and Cultural Diversity in Wilderness." The main theme of the paper was that traditional knowledge and approaches, such as oral agreements, aboriginal land-use patterns, indigenous communication strategies, and authority hierarchies can and must be integrated into wilderness management. From the paper's discussion emerged the idea that indigenous knowledge can be used to bridge international wilderness management beliefs and practices.

The power of wilderness as a teacher and classroom for environmental education and human restoration, growth, and development was another strong theme. The presentations on solitude by Bill Hammitt and Steve Hollenhorst and others provide scientific leadership in advancing our under-

standing of how wilderness functions for personal growth, restoration, and inspiration. Such use of wilderness is growing, and the eight presentations on this subject provided new ideas and connections for wilderness experience program operators in several countries.

Canada and Australia presented their rapid progress on inventorying, planning, proposing, and otherwise structuring their wilderness systems. Finland is particularly noted as having the newest wilderness law, with innovative ventures in wilderness research and management.

Two papers described the efforts of wilderness managers in South Africa to integrate people into wilderness landscapes in undeveloped countries; two papers on the Adirondack State Park Wilderness in New York described wilderness as a living landscape in the modern world. Their common theme, integrating people and wilderness, may be the ultimate wilderness challenge worldwide.

The U.S. wilderness agencies—USDA Forest Service and USDI National Park Service, Bureau of Land Management, and Fish and Wildlife Service—addressed numerous important issues such as fire ecology and air quality, the limits of the acceptable-change approach to wilderness planning, management of subsistence activities, aboriginal claims in Alaska park wilderness, the circumpolar Biosphere Reserve Network for monitoring change, park wilderness and biodiversity, managing Arctic wilderness, wilderness rivers, integrating biological and ecological diversity in planning, and monitoring wilderness to detect global change.

The essence of what we learned was that steady progress is being made in international wilderness allocation, management, and research. However, we were continually reminded not to take wilderness for granted.



ARCTIC WILDLIFE AND WHALING: CONFLICTS IN MANAGEMENT

Ian Stirling

Just as there is a wide range of opinions about the definition of *wilderness*, there is also a wide range of opinions about how to deal with any single biological question by different individuals or groups. Of particular significance is the fact that differing philosophical value systems sometimes make it difficult to reach a common ground to answer such questions. For example, people with secure incomes who live in high-density urban areas far removed from wilderness tend to have different perceptions from those who live in the wilderness and depend to some extent upon animals such as caribou or certain whale species. Similarly, those who live in cities often perceive the wilderness value of large predators rather differently from those who feel themselves or their livestock threatened by bears or wolves. In contrast, those who live largely by subsistence in remote areas of the Arctic, for example, may not want their existence disrupted by exploitation of non-renewable resources, even though they probably use gas and oil in their houses or snowmobiles.

Despite the extent of the differences that exist on some environmental issues, this symposium highlighted some encouraging examples of collaboration to address mutual concerns. For example, on the North Slope of Alaska, where there is a potential for hydrocarbon exploration to have a detrimental impact on caribou, waterfowl, and other species, industry and government have come together to fund research to address these concerns. This is not to suggest that all the problems are solved, but the important point is that people are talking about and collaborating on these issues.

One of the most contentious issues in the conservation of Arctic wildlife is that of whether or not humans have the right to manage wolves or, put more bluntly, to kill wolves for the purpose of allowing more ungulates to survive for human consumption. We learned of an enlightened approach, taken in the Yukon, where members of the public, representing the full gamut of opinion from wilderness guides to native peoples to the most ardent of preservationists, worked together to develop a management plan for wolves. No one person was completely satisfied with everything in the plan, but each had some of his or her concerns represented and, therefore, had some input in the final product. The most significant aspect was that progress was only made after people established their common ground. For example, everyone wanted to ensure the survival of viable populations of wolves. Differences developed over aspects such as where they should be, how many there should be, and whether the goal should be achieved with or without human influence.

It was also clear from several symposium papers that to make any progress in the resolution of controversial issues, there needs to be a clear separation between facts and feelings. Nowhere was this more apparent than in the discussion, such as it was, of whaling. Leaving aside concerns about whether or not the differing viewpoints were equally represented, some fundamental aspects were not addressed. Although it seemed everyone wanted to ensure preservation of healthy populations of all whale species, even this most fundamental point was never actually clarified. In theory, a population of whales can remain healthy if it is not harvested at all, if it is harvested at Maximum Sustained Yield, or if it is maintained at Optimum Sustainable Population, as it is somewhat nebulously defined by the U.S. Marine Mammal Protection Act. Thus, in theory, we could have healthy whale populations whether we harvest them on a sustained basis or don't harvest them at all. Consequently, the ultimate issue appears to be less one of conservation than one of personal values. This does not mean that one view is more moral than another, but simply that there are differences. For example, some symposium participants supported sustainable aboriginal whaling, but not sustainable whaling by nonaboriginal peoples. But are these two circumstances really different? This example illustrates the need to clarify the differences between factual material and personal value systems. This is easier said than done, but it is essential if we are to make any progress in the resolution of this issue or similar ones.

Finally, another common theme of the symposium was the need for long-term monitoring and ecological studying of wildlife populations. The Arctic environment is so variable that most trends, if they exist at all, will not be detectable in a short-term study.



TRANSLATING WILDERNESS

Nina Witoszek

Wisdom can be viewed as something that exists independently, whether we want it to or not. At the same time, we inherit its meaning through stories endowed with values, whether we want to or not. Wisdom, much like nature, is mediated by and through culture, and any description or definition of it is always a translation project and is often a betrayal of the original meaning. Thus, the definitions of *wisdom* and *wilderness* are often convoluted and ill-defined.

One way to gain a better understanding of wilderness is to study language, mythology, religion, ideology, human psychology, natural behavior, and social policy. By doing so, we can identify key patterns and issues such as the need to “rediscover” wildness and nature in general, an awareness of the limitations of language and how it can be a barrier to achieving a necessary oneness with nature, the importance of indigenous ideas about “wilderness” as more relevant to modern society than are contemporary definitions of “wilderness,” the potential danger of the ideological agendas often used by wilderness advocates, and the reality of the genetic constraints of our heritage. These issues and others are encountered when translating “wilderness” and must be dealt with if we are to “reinhabit” the planet.



STRATEGIES FOR PROTECTING ARCTIC WILDERNESS

Thor Larsen and Pamela Miller

While Russia's establishment of the Great Arctic Reserve is commendable, the establishment of additional Russian reserves is a priority due to the low percentage of protected areas in the Russian Arctic. International funding support for the new reserves is required. Numerous countries have moved to identify and fill the gaps in protected areas, but, in general, more efforts are needed to identify gaps in the United States, Greenland, Iceland, and Russia. General observations and recommendations of this symposium were:

1. A short time is available for necessary conservation and habitat protection due to the intensity of ongoing or planned industrial development.
2. Moratoriums, like that which Norway has, on new development in areas proposed or under consideration for protected status are needed.
3. Planning, establishment, and management of protected areas will need the meaningful involvement of indigenous peoples.
4. Strict protection areas such as Russian *zapovedniks* or U.S. designation in the National Wilderness Preservation System in Alaska are required for critical habitats.
5. Existing protected areas need to be defended from incompatible development.

6. A system of biosphere reserves with strict protection for caribou calving grounds in the Canadian Arctic could be well suited to provide critical habitat for traditional indigenous use and carnivore conservation.
7. Consideration must be given to upgrading areas (especially World Conservation Union categories VI through VIII) that do not have adequate protection.
8. More attention to conserving marine areas in the Arctic Ring of Life is particularly needed.
9. Cultural preservation issues need to be considered, including recognition of cultural values of some contemporary installations.
10. Biogeographical classification and mapping must be compatible between countries, but this must not be an excuse to slow down conservation efforts.

Recognizing the need for healthy habitat within protected areas, this symposium called for concerted actions to halt global transboundary pollution sources that affect the Arctic. Further international agreements are needed to provide proper levels of protection to Arctic habitats, especially to facilitate establishment of marine protected areas, and may include:

- extension of existing agreements about the Arctic (e.g., the Paris Convention);
- new agreements to cover specific problems and high-sea areas, particularly because the Arctic Ocean is not covered by an international treaty or regional sea convention under the United Nations Environment Program;
- coordination among relevant agreements and progress towards comprehensiveness in coverage so that gaps are filled and impetus gained that could lead to a framework convention;
- stronger national legislation and regional agreements linked to existing treaties and conventions where feasible and appropriate; and
- political strategies that are necessary to protect Arctic habitat.

In addition to its general task of providing recommendations to the 5th World Wilderness Congress, this symposium also acted as a planning session that provided advice to Norway's Directorate for Nature Management in revising its second draft of "The State of Habitat Protection in the Arctic."



THE POLAR BASIN AND ITS ARCTIC RIM: PRODUCTIVITY AND GLOBAL CHANGE

Paul Wassmann

Two years ago, two scientific icebreakers reached the North Pole and consequently doubled the amount of data we have about the Polar Basin, illustrating that this is the least-known part of the world's oceans and that our knowledge of this area is merely rudimentary. Scientists also tell us that this area is important for global environmental change.

The aim of the Arctic scientific program is to understand the basic physical, chemical, and biological features of the Polar Basin. More research is needed, however, especially regarding mathematical models. While scientists tell us that the Polar Ocean is important for global change, the existing models for change don't function well or even show all the details currently known about the Polar Basin. In addition, we should have a much better understanding of the past climatic variation that is hidden in the geological record of the Polar Ocean, and which would teach us a lot about the existing variables and how quickly changes may occur.

Finally, simply measuring pollution or monitoring certain substances does not give a clear picture of the Arctic, just as a patient with heart trouble will not improve through having his or her blood analyzed. Doctors need to understand something about the whole body in order to correctly analyze the blood sample. Similarly, it's important for scientists not to waste money on monitoring programs that will not significantly contribute to improving our knowledge about the Polar Ocean. Otherwise, we will believe that we are doing something while we are actually doing nothing.



TRADITIONAL INDIGENOUS KNOWLEDGE AND MODERN RESOURCE MANAGEMENT

N.C. Stenseth

As a part of the Norwegian Man and Biosphere Program (within UNESCO), this symposium explored traditional and indigenous knowledge in our efforts to achieve sustainable development and management of natural resources in northern and high-altitude ecosystems. A common theme throughout this area is that humans must be considered as an integrated part of nature, as has been done in indigenous societies. This is a different approach from that in Western society, where humans are often viewed as separate from nature.

Some of the key issues identified, and upon which further work needs to be done, are: gender aspects of traditional and indigenous knowledge; cooperation between traditional and modern management of natural resources such as occurs in various parts of India, Canada, and the High Arctic; and incorporation of traditional (“integral”) knowledge into modern computer-based systems such as geographical information systems.

Resolutions of the 5th World Wilderness Congress



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FOREWORD

The 5th World Wilderness Congress (WWC) convened in Tromsø, Norway, in September 1993 under the theme *Wild Nature and Sustainable Living in Circumpolar Regions*. For eight days, participants from twenty-five countries and states discussed environmental and cultural conservation at high latitudes. Problems of international consequence were examined from many different angles and perspectives. Topics ranged from digital satellite mapping and global change to wilderness philosophy and the value of silence, and from international conservation legislation to the rights of minority peoples who number less than polar bears. Conservation of the Arctic and of Antarctica—vast and still relatively inaccessible—was considered in the light of recent changes in world politics and of the lessons learned from wilderness conservation at lower latitudes. We were reminded of the complete redundancy of assuming that remoteness affords pristine nature any protection.

Despite the enthusiasm and interest generated during the event itself, the lasting value of congresses of this kind lies in the useful information exchanged, the new ideas they spawn, and the influence they have on decisions in the world of policy, economics, and education. Key aspects for these new ideas and influences are the resolutions for future action that emerged from the meetings and discussions held.

This document includes the text of the “Resolutions of the 5th World Wilderness Congress,” which is, thus, perhaps the most important tangible product of the congress. It is our hope that the resolutions included here will

receive the widest possible distribution and the greatest possible attention.

On Saturday, 2 October, the day after the closing of the congress, Ms. Rakel Surlien, Chairman of the Governing Board of the 5th WWC (Norway), presented these resolutions to the chairman of the Northern Forum, Governor Walter Hickel of Alaska, at the opening of the 1993 General Assembly of the Northern Forum in Tromsø. Copies were also given to each member of the board of directors of the Northern Forum and further copies will be distributed to the offices of all regional authorities that participate in the Northern Forum. In this way, we intend that these resolutions reach as many as possible of the people directly responsible for government of the North. We hope, too, that the participants at the 5th WWC will distribute them far afield and will see to it that they are acted upon and implemented.

Included at the end of this document is a description of the procedure by which the resolutions were proposed, reviewed, and finally accepted by the Resolutions Committee on behalf of the congress. Reviewing, revising, and, in some cases, rewriting the original proposals that delegates submitted was an arduous task carried out under a series of short deadlines. It is a pleasure to acknowledge and to thank, on behalf of all participants at the 5th WWC, each member of the Resolutions Committee: Paul Dingwall (Chairman), Lars Anders Bær, Robin Pellew, Pål Prestrud, Peter Prokosch, Fred Roots, and Elin Pierce for their outstanding work and their time freely given.

—*Nicholas Tyler*
Chairman, Program Committee
Tromsø, Norway
14 October 1993



PRESENTATION OF RESOLUTIONS TO THE NORTHERN FORUM

Mr. Chairman and honored delegates to the First Northern Forum Conference, as I am sure you are aware, the 5th World Wilderness Congress (WWC) closed in Tromsø yesterday and, for those of us who attended it, there now begins a period of reflection about the congress and its significance. The lasting value of such an event lies in the useful information exchanged, the new ideas developed, and the influence this exchange and development has on policy, economics, and education. The first tangible product of the congress, therefore, is the resolutions that emerge from it.

These resolutions achieve two things. First, they represent, in summary, the thinking of an extremely diverse group of people, experts in many relevant fields and amateurs, all of whom share a deep concern regarding conservation of the environment and, particularly, in this case, conservation of polar regions. Secondly, they provide a set of guidelines for action.

I am here this morning to formally present these resolutions to you on behalf of the 5th WWC. In doing so, I represent the four hundred delegates from twenty-five countries, states, and regions who were present at the congress.

Allow me, as a former minister of environment, to say that being chairman of the congress has given me renewed inspiration to work for protection of the environment here in the North, in a region where conditions are hard. And I do hope, Mr. Chairman, that you and the delegates at the First Northern Forum Conference will share this inspiration and optimism.

I also give my most warmhearted thanks to the host of Northern Forum, the Regional Authority of Northern Norway, and its chairman, Governor

Erling Fløtten of Finnmark, for considerable help without which we would not have been able to arrange this congress. Furthermore, I would like to emphasize the value of the exchange of experience and ideas we have seen here during the past week between environmentalists of the congress on one hand and the politicians of the Northern Forum on the other.

Our prime minister, Mrs. Gro Harlem Brundtland, has persistently—and I may add, as is her nature!—stated that without grassroots action, personal involvement, and both local and regional engagement backed with the advice of experts, the politics of environmental conservation could never move forward. This is especially true in those parts of the world that have “traditionally” been neglected in this regard.

The theme of the 5th WWC has been *Wild Nature and Sustainable Living in Circumpolar Regions*. For eight busy days, we listened to lectures and discussed with friends and colleagues many aspects of conservation and commerce, law and management, and philosophy and politics as they concern the wild places of our planet Earth. Mentally, we travelled from the South to the North Pole, and, on the way, we touched many countries and states. But, for the most part, we concentrated on life at high latitudes.

There is no doubt that the Arctic, both by land and by sea, is vulnerable and threatened. There is also no doubt that strong conservation measures are absolutely necessary in this region. But I am glad to say that the outlook is not altogether bleak. Only this year, 4 million hectares of tundra—an area the size of Denmark—on the Taymyr Peninsula in northern Russia were officially protected. In recognition of this, the Governing Board of the congress conferred the Green Leaf Award to the people of Taymyr.

The award itself is a small bronze statue of a North American Indian chief called *Grey Owl*. Let me tell you a secret: Grey Owl was, in fact, an Englishman. He emigrated to Canada where he adopted the culture of the North American Indians. The leaf he is holding is actually from a tree that grows in South Africa. It is the emblem of The WILD Foundation. So, this is an interesting situation in which an award is given on behalf of an American foundation, depicting an Englishman dressed as a North American Indian holding a South African leaf, presented by a Norwegian to the Russian people of Taymyr in recognition of work they carried out that was inspired by a German. Environmental conservation is truly international!

I would like to draw your attention to two specific areas of interest at this congress: Antarctica and the Arctic. The congress emphasized the absolute requirement that Antarctica should be managed in the interests of humankind, in a manner that conserves its unique environment, preserves its value for scientific research, and retains its character as a demilitarized, non-nuclear zone of peace.

Hammering out an internationally supported consensus on Antarctica is a huge task. Yet, such a consensus is the only way to prevent a tragic plundering of that silent continent and to maintain Antarctica as a symbol of peaceful international cooperation and environmental protection.

The challenge of the Arctic is far more complex. There was a concerted call from the 5th WWC for an Arctic Conservation Strategy that integrates the traditional and subsistence practices of native peoples of the North with the need for protection of wilderness values and wildland areas for future generations of all societies.

I would like, in this respect, to quote from the closing remarks at the congress given by Vance Martin, president of WILD:

The conservation and protection of wild nature and wilderness values for all peoples of the North has now been placed firmly in the center of the Arctic development debate. The challenge outlined by this congress is for the Arctic to no longer be seen as a frontier, ripe for exploitation, but rather as a cultural, biological, and economic model for the entire world, of an ecosystem allowed to be self-sustaining through the wise stewardship, cooperation, and farsighted vision of all the peoples of the Arctic.

The spirit and ideas of the congress reflected the following passage from “Our Common Future”—the report from the World Commission on Environment and Development (1987):

The ability to choose policy paths that are sustainable requires that the ecological dimensions of policy be considered at the same time as the economic, trade, energy, agricultural, industrial, and other dimensions—on the same agendas and in the same national and international institutions. That is the chief institutional challenge of the 1990s (p. 313).

There are significant proposals in the thirty Resolutions of the 5th World Wilderness Congress. They call for action at international, national, and regional levels. They call for action from you, ladies and gentlemen. You are the decision makers. You can influence your governments. I hope that you will be influenced by us through the resolutions of this congress.

I would like to remind you of the six priority areas for institutional and legal change necessary to make the transition to sustainable development. Again, to quote “Our Common Future,” these areas are:

- getting at the sources,
- dealing with the effects,
- assessing global risks,
- making informed choices,
- providing the legal means, and
- investing in our future.

These themes recur throughout the resolutions, and the resolutions themselves fall into six main categories that I believe are directly relevant to the Northern Forum's work and our common future in the northern regions.

Five resolutions concern international conventions and agreements and twelve concern protected areas. Three resolutions concern an extremely important topic—the definition and assessment of wilderness. Of critical importance, two resolutions address issues that concern indigenous peoples. There are two resolutions about the sustainable use of renewable natural resources, and, finally, there are four resolutions about pollution and development issues.

You are all completely familiar with these themes, but your perspectives are perhaps somewhere different from ours. This is a good thing. We are ultimately confronted with the same challenges. We all can benefit by examining common problems from different angles.

It is my hope that you will examine these resolutions carefully and that they will strongly influence future policy for the government of the North for which you are responsible. Finally, Mr. Chairman, the 5th World Wilderness Congress wants you all to act.

—Rakel Surlien
Chairman, Governing Board
Tromsø, Norway
2 October 1993



RESOLUTIONS

A. INTERNATIONAL CONVENTIONS AND AGREEMENTS

1. Convention on Biological Diversity and Designation of Wilderness

A fundamental requirement for the conservation of biological diversity is conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings. In the context of human-induced climate change, one of the most effective long-term measures for the protection of biodiversity is the identification, monitoring, and management of the world's remaining wilderness areas. This has been recognized through including wilderness as one of the special characteristics of ecosystems to be identified by states ratifying the Convention on Biological Diversity under Article 7, Annex 1.

The 5th World Wilderness Congress:

1. recommends that all states act as rapidly as possible to ratify the Convention on Biological Diversity and enact national measures for its implementation;
2. requests that in preparing their national biodiversity strategies and action plans in compliance with Article 6 of the convention, contracting parties shall conduct and complete inventories of their lands that are suitable for designation as wilderness; and

3. recommends that all contracting parties give serious consideration to the inclusion of lands representative of each important ecosystem within their boundaries as protected wilderness, in consultation with the indigenous peoples.

Proposer: Karenne Jürd, Wilderness Society of Australia, 1 James Lane #A, Sydney 2000, New South Wales, Australia

Seconder: Verne McLaren, Amaroo, Post Office Box 114, Robe 5276, South Australia, Australia

2. A Regional Arctic Strategy for Implementation of the Convention on Biological Diversity

The eight arctic nations recently signed the Convention on Biological Diversity. Norway and Canada have already ratified the convention. Ratification by all Arctic states would reinforce the effective implementation of the Arctic Environmental Protection Strategy and its program of Conservation of Arctic Flora and Fauna.

The 5th World Wilderness Congress:

1. urges those Arctic countries that have not ratified the Convention on Biological Diversity to do so as rapidly as possible; and
2. recommends the development of an Arctic regional strategy for the implementation of the Convention on Biological Diversity.

Proposer: Ian Stirling, Canadian Wildlife Service, Edmonton, Alberta, Canada

Seconder: Peter Johan Schei, Directorate for Nature Management, Trondheim, Norway

3. Polar Bear Treaty

The Polar Bear Treaty involving five cooperating countries is the first and longest-standing treaty concerning conservation in the Arctic. The treaty has helped to ensure that the distribution of polar bears is still close to its original extent. This is true for no other species of big carnivores in the world today. Polar bear populations offer a unique resource for biological studies from which we can learn much that has direct relevance for the conservation of other large carnivores.

At its meeting in January 1993, the World Conservation Union Polar Bear Specialist Group presented data indicating that some of the polar bear sub-populations in Canada are already overexploited. The Russian government's

recent consideration to lift the ban on polar bear hunting in Siberia after nearly forty years of total protection, therefore, gives cause for international concern.

The 5th World Wilderness Congress:

1. urges that Russia and Norway maintain their ban on polar bear hunting and harvesting for commercial or subsistence purposes;
2. urges all Arctic nations to strengthen the Polar Bear Treaty through further financial commitments for management and research; and
3. urges those Arctic nations harvesting polar bears to apply the precautionary principle so as to ensure that over-exploitation never happens.

Proposer: Andre Ivanov-Smolensky, Social Ecological Union, Chapaevsky St. 12/1, 24, Moscow 125252, Russia

Secunder: Victor Nikiforov, Deputy Director, Great Arctic Reserve, Novo-Cheremyskinskaya, Moscow 117418, Russia

4. Comprehensive Protection of the Antarctic Environment

In Madrid in 1991, the Antarctic Treaty states adopted the Protocol on Environmental Protection to the Antarctic Treaty. The protocol provides for comprehensive protection of the Antarctic environment and the dependent and associated ecosystems; designates Antarctica as a natural reserve devoted to peace and science; imposes a ban on all mineral resource activities for at least fifty years; and includes extensive measures for environmental impact assessment procedures, protection of antarctic flora and fauna, management of wastes, prevention of marine pollution, and establishment of areas for special protection and management, including recognition of wilderness values.

Although the treaty parties have agreed to observe the provisions of the protocol on a voluntary basis, the protocol will not take effect until all the consultative parties to the Antarctic Treaty have enacted domestic ratifying legislation. To date, only five of the twenty-six consultative parties (Norway, Ecuador, France, Peru, and Spain) have ratified the protocol.

The protocol also remains incomplete, particularly in respect to rules governing liability for environmental damage and response action. Moreover, while the protocol is intended to govern all human activities in the Antarctic, the treaty nations have not yet reached complete agreement on how adequately the protocol relates to management of tourist activities.

The 5th World Wilderness Congress:

1. applauds the Antarctic Treaty parties' adoption of the Protocol on Environmental Protection to the Antarctic Treaty;
2. requests the treaty parties to continue to implement the provisions of the protocol on a voluntary basis during the interim period;
3. urges the treaty consultative parties to ratify the protocol and allow it to take effect as a matter of urgency and to promptly proceed with revising their domestic regulations to comply with it;
4. further urges the treaty parties to complete the liability provisions of the protocol to ensure that clear, legally binding obligations are imposed on all who administer or conduct activities in the Antarctic; and
5. requests the treaty parties to review the provisions of the protocol with respect to the management of tourism and, if necessary, recommend measures to ensure more stringent environmental protection.

Proposer: Edgar Wayburn, Antarctica Project, Washington, D.C., USA

Seconder: Harold Eidsvik, Commission on National Parks and Protected Areas, World Conservation Union, 20 bis rue Jean Grandoux, Paris, France

5. Support for the Proposed Chamela-Cuixmala Biosphere Reserve

Biosphere Reserves of UNESCO's Man and Biosphere Program have been established for protection of biological and cultural diversity and associated research, monitoring, education, and training in 130 countries. There is a need, however, to nationally and internationally extend and develop this network of biosphere reserves through establishment of additional reserves in areas that provide opportunities for the development of biosphere reserve objectives.

One such example is the Chamela-Cuixmala bio-region on the coast of Jalisco State in Mexico. This site has:

- one of the highest concentrations of migratory birds in the Western Hemisphere, composed of more than 140 Canadian and U.S. species, which, under international treaty, Mexico has pledged to protect;
- the largest numbers of endemic and endangered vertebrate

- species in Mexico and Central America, many of which are protected by law;
- one of the largest areas of undisturbed tropical dry forest in one ecosystem;
 - a unique occurrence of rivers, oceans, wetlands, and tropical dry forests in one ecosystem;
 - the only estuary that is protected among the six estuaries on the coast of Jalisco; and
 - nesting sites for endangered marine turtles that are protected under presidential decree.

This site is, nevertheless, threatened by encroaching development. Leading scientists and environmentalists in Mexico have, therefore, developed a comprehensive and authoritative proposal for establishing a biological reserve in this area. Through the research efforts of the National Autonomous University of Mexico, which has maintained a biological station in the Chamela-Cuixmala bio-region for the past twenty-three years, and of many foreign scientists, the environmental importance and wilderness values of this endangered biosphere have been conclusively demonstrated.

The 5th World Wilderness Congress:

1. recognizes the importance of biosphere reserves and the need to strengthen their numbers, protection, and management;
2. reinforces the need to develop biosphere reserves as sites for research and monitoring of the relationships between natural areas and human resource use;
3. supports the efforts of Mexican and other scientists to establish a protected biosphere in the Chamela-Cuixmala bio-region; and
4. requests the president of Mexico to affirmatively act on behalf of the proposed Chamela-Cuixmala Biosphere Reserve.

Proposer: Vance Martin, President, The WILD Foundation, 2162 Baldwin Rd., Ojai, California 93023, USA

Seconded: Ian Player, Founder, Wilderness Leadership School, P.O. Box 53058, Yellowwood Park 4011, Natal, Republic of South Africa

B. PROTECTED AREAS

IDENTIFICATION AND STRENGTHENING OF PROTECTED AREAS

6. *A Circumpolar Network of Arctic Protected Areas*

An important opportunity to protect biodiversity at a landscape scale now exists in the Arctic but will become more difficult as development pressures increase. There is a need for an international network of large-scale protected areas covering terrestrial and marine ecosystems, in which the overriding purpose is conservation of natural diversity and habitat but where indigenous subsistence on living resources may still occur. The need for conservation measures is especially pressing in the vulnerable near-shore and marine areas of the Arctic Ring of Life.

Existing transboundary protected areas such as the Arctic National Wildlife Refuge (USA), Ivvavik and Vuntut National Parks (Canada), and Beringia Heritage International Park (endorsed by the USA and Russia) form a strong basis for an international network of Arctic protected areas. The integrity of the first large-scale Arctic wilderness reserve for wildlife ranging across international boundaries, consisting of the Arctic National Wildlife Refuge and the adjacent Ivvavik and Vuntut National Parks, is threatened by proposals to allow oil drilling over 6,072,875 hectares of the U.S. coastal plain.

The Arctic Wildlife Refuge is the only area protecting a broad spectrum of sub-Arctic and Arctic habitats in the United States. It comprises 10 percent of the remaining U.S. Arctic coastline not already open to oil exploration or development, and its coastal plain supports internationally significant resources subject to treaties or agreements, including polar bear denning areas, snow goose autumn staging habitat, and critical calving and postcalving habitats for the porcupine caribou herd. This caribou herd supports Canadian and U.S. indigenous peoples, and development particularly threatens the subsistence livelihood and culture of the Gwichin people.

The 5th World Wilderness Congress:

1. thanks the ministers of the eight Arctic nations for supporting planning efforts for developing a network of Arctic protected areas in the Arctic Environmental Protection Strategy;
2. requests the governments of the eight Arctic nations to begin urgent action to fill gaps in their terrestrial protected area systems, providing habitat protection measures at least as strict as those of U.S. wilderness designation in Alaska for critical areas, and to designate marine protected areas in the Arctic Ring of Life;

3. recommends that the governments of the eight Arctic nations give high priority to development of an Arctic network of protected areas in terrestrial and marine ecosystems;
4. recommends that the U.S. government actively pursues permanent wilderness designation of the 6,072,875-hectare coastal plain area of the Arctic National Wildlife Refuge due to its international significance;
5. thanks the Gwich'in people for their dedicated work in protecting the internationally important Arctic ecosystem spanning the United States and Canada; and
6. recommends that the U.S. and Russian governments work closely with indigenous peoples to establish the Beringia Heritage International Park.

Proposer: Pamela Miller, Wilderness Society, 430 West 7th Avenue #21, Anchorage, Alaska, USA

Seconded: Michael McCloskey, Chairman, Sierra Club, 408 C Street NE, Washington, D.C., USA

7. *Russian Arctic Wilderness*

The Russian Arctic includes one of the largest areas of wilderness in the world. Recent events in the country have the potential either to threaten these natural areas or advance their conservation.

Some Russian Arctic areas are extremely polluted (e.g., Noril'sk, Kola Peninsula, and parts of Yamal). New oil and gas developments in which certain Western companies are involved have the potential to destroy new areas. However, if confined to already industrialized areas, these developments could advance environmental safety and encourage more effective resource management.

Political destabilization within the region could result in an escalation of threats to the environment. On the other hand, strengthening the rights of local authorities and indigenous peoples may safeguard the protection of natural and cultural values and thus ensure sustainable use of local natural resources.

To protect wilderness, Russia has developed the category of *Zapovednik*, a special type of area for the protection and study of natural habitats. The concept of this type of protected area could be adopted by other nations for protecting wilderness. Russia may also introduce other types of protected areas, such as Man and Biosphere (MAB) reserves, to achieve a wider range of management or the integration of nature and culture conservation.

The 5th World Wilderness Congress:

1. welcomes Russia's commitment to develop guidelines for a circumpolar protected-area system within the framework of the Arctic Environmental Protection Strategy and its contribution to the network of MAB circumpolar reserves;
2. welcomes Russia's commitment to complete a network of protected areas in the Arctic;
3. congratulates the Russian government for establishing the Great Arctic Reserve on Taymyr Peninsula, which doubles the size of the country's strictly protected areas in the Arctic;
4. encourages other nations and international nongovernmental organizations to increase cooperation with Russian authorities in order to safeguard existing wilderness protection and set up further reserves of different categories;
5. urges joint ventures on environmental issues to:
 - clean up the most polluted areas;
 - improve the monitoring of the state of the Arctic environment;
 - improve ecological education of local administrators, business people, and other environmental decision makers; and
 - establish ecologically sound tourism in the Arctic that supports local communities and wilderness conservation objectives; and
6. urges oil and gas companies to confine their joint activities in the Russian Arctic to already existing industrialized areas and develop improved techniques and standards for environmental safeguards and efficiency before developing oil and gas reserves in other pristine areas.

Proposer: Alexander Drodzov, Geographical Institute, Russian Academy of Sciences, Moscow 55-2, F. 40, Russia

Seconder: Victor Nikiforov, Deputy Director, Great Arctic Reserve, Novo-Cheremyskinskaya, Moscow 117418, Russia

8. Conservation of Wilderness and Biodiversity in the Norwegian Arctic

Norway has officially protected 25 percent of its Arctic land area, most of which is in Svalbard. However, Arctic ecosystems on the Norwegian mainland and in the marine areas are not adequately protected.

The former continuous wilderness areas of northern Norway have been increasingly transected and altered by roads and hydroelectric developments.

Semidomesticated reindeer appear to have degraded the vegetation in parts of Finnmark, while modern forestry practices with clear-cutting and spruce plantations have altered the natural biodiversity of the forests. Wolves are nearly extinct in Norway; and wolverines, brown bears, and the mainland Arctic fox are endangered.

The southern Barents Sea has been opened to oil and gas development, and Norwegian authorities are considering extending this development in the near future to the northern Barents Sea, which is partly ice-covered. Oil spills in coastal and icy waters represent a major risk to the seabirds, marine mammals, and fisheries of the Barents Sea. No adequate technologies exist to manage major oil spills in waters with floating ice.

Norway has an international responsibility to protect northern alpine areas, coastal areas, fjord systems, and northern/oceanic coniferous forests in the Norwegian Arctic. The latter three of these habitats and marine areas are not adequately represented among existing protected areas.

The 5th World Wilderness Congress:

1. recommends that Norway develop a strategy to conserve biodiversity and the remaining wilderness areas of the Norwegian Arctic, taking into account the needs of indigenous peoples;
2. requests that Norwegian authorities develop and implement a system of protected areas that covers the full diversity of terrestrial and marine ecosystems and habitats in the Norwegian Arctic, the management of which must comply with World Conservation Union criteria; and
3. recommends that Norwegian authorities discourage further oil and gas activities in the Barents Sea and prohibit development in areas adjacent to bird colonies and with seasonal ice cover.

Proposer: Fredrik Theisen, Norges Naturvernforbund, Box 2113 Grünerløkka, N-0505 Oslo, Norway

Seconder: Tom Dybwad, Hermansverk, N-5840 Norway

9. Wilderness Areas in Europe

Few people realize that there is wilderness in parts of central Europe, a perception that has been dulled by the consequences of prolonged, continuous human impact on the land and the political confusion and complexity caused by warfare. However, wilderness does exist in central Europe, and, no matter how small or diffuse, these areas must be protected.

After considerable action in Italy over the last fifteen years, several wilderness areas have been proclaimed in principle. The 3rd and 4th World

Wilderness Congresses adopted resolutions in support of wilderness designation for what is perhaps the largest remaining wild area in Italy, Val Grande, by means of regional government statute. At the 4th World Wilderness Congress, the Piedmont regional government pledged to establish this wilderness. The first step in this process was taken in 1992.

The 5th World Wilderness Congress:

1. praises the various Italian councils and municipalities that have already declared one or more wilderness areas, noting that this designation is unique in central Europe;
2. encourages these and other authorities to continue this wilderness protection process and increase their understanding of wilderness values as a model for the European continent;
3. recognizes that wilderness exists in other nations and regions in Europe, which, because of their small size and proximity to large population centers, need special management to regulate visitor numbers and usage;
4. requests the Piedmont regional government or other higher bodies to recognize and protect the unique wilderness values of Val Grande by designating a significant portion of Val Grande National Park as "area wilderness," as was pledged at the 4th WWC; and
5. asks all European governments, nongovernmental organizations, and research and management organizations to identify and press for legal protection of the remaining wilderness areas in Europe.

Proposer: Associazione Italiana per le Idee di Wilderness

Seconder: Vance Martin, President, The WILD Foundation, 2162 Baldwin Rd., Ojai, California 93023, USA

10. Buffer Zones to Protect Wilderness

If they are to fulfil their objectives in the long-term protection of biological diversity, protected wilderness areas must be of adequate size and include surrounding buffer zones and corridors.

The 5th World Wilderness Congress:

1. requests that the 6th World Wilderness Congress gives attention to the scientific and cultural issues relevant to the development of buffer zones of appropriate size and scale for protection of wilderness values.

Proposer: Laura Westra, International Society for Environmental Ethics, Windsor, Ontario, Canada

Seconder: Reed Noss, Conservation Biology, Corvallis, Oregon, USA

11. Funding Protected Areas

The protection of habitat and species in cooperation with indigenous populations is a complex social, economic, and political issue. Most protected areas in developing countries are seriously underfunded. This fact was emphasized by Recommendation 7 of the IV World Congress on National Parks and Protected Areas held in Caracas in February 1992.

Areas protected under international conventions and programs such as World Heritage sites, Ramsar sites, and Man and Biosphere reserves provide opportunities to conserve biological diversity throughout the world. The Global Environment Facility, through grants and trust funds, is one of the key mechanisms for funding biodiversity conservation. Such funding must be endorsed by the participating nations of the Global Environment Facility, and it will be the role of the Conference of Parties of the Convention on Biological Diversity to assign priorities for receipt of funds, including those for protected areas.

The 5th World Wilderness Congress:

1. requests recognition of the funding needs of developing countries in the management of protected areas; and
2. urges the contracting states of the Convention on Biological Diversity and the Global Environment Facility to give priority to funding protected areas.

Proposer: Harold Eidsvik, Commission on National Parks and Protected Areas, World Conservation Union, 20 bis rue Jean Grandoux, Paris, France

Seconder: Thor Larsen, NORAD, Norway

12. International Federation of Parks and Wilderness Community Support Groups

South Australia has one of the world's best systems of community support for national parks and wilderness areas. The Friends of Parks program has approximately six thousand members and has been extended to cover all the Australian states.

It is proposed that the program should now become international, developing a network with similar park support schemes in other countries such as the United States, Canada, and the United Kingdom. The network

would involve correspondence between participants with regularly updated lists of contact names and addresses to whom newsletters would be sent. This would enable park support managers and volunteers to keep each other informed about new ideas and methods of providing community support for parks and wilderness. The proposed International Federation of Parks and Wilderness Community Support Groups would facilitate exchange of information and contacts worldwide and link people of different cultures who share common interests.

All 5th World Wilderness Congress participants are invited to take part in the federation, which will be developed out of, but independent of, the congress. It will be self-financing through membership subscriptions.

The 5th World Wilderness Congress:

1. encourages the formation of an International Federation of Parks and Wilderness Community Support Groups for the purposes of linking community volunteers worldwide and enhancing the interchange of ideas, methods, and experience.

Proposer: Dene Cordes, 121 Sheok Road, Belair 5052, South Australia, Australia

Seconder: Verne McLaren, Amaroo, Post Office Box 114, Robe 5276, South Australia, Australia

MARINE PROTECTED AREAS

13. Marine Protected Areas

Oceans cover approximately 70 percent of the world's surface. However, with the exception of some coastal marine reserves established by a few coastal and island states, ocean ecosystems have been largely neglected by those who plan and promote protected areas. The 4th World Wilderness Congress recommended that each nation develop a system of marine protected areas that included designated wilderness areas.

In accordance with the revised system of classification of Terrestrial and Marine Protected Areas adopted by the World Conservation Union Commission on National Parks and Protected Areas following the IV World Congress on National Parks and Protected Areas in 1992, all marine areas are eligible for protected-status consideration.

The United Nations Convention on the Law of the Sea (UNCLOS) will possibly take effect in 1994. The UNCLOS is an appropriate agency to assume responsibility for developing a plan for marine protected areas.

The 5th World Wilderness Congress:

1. encourages coastal and island nations to establish, under national legislation, representative systems of marine protected areas, including areas with wilderness designation;
2. recommends that appropriate international agencies establish protected areas in international marine waters, including areas designated as wilderness; and
3. recommends that the International Maritime Organization be involved in developing a plan for marine protected areas because it has already developed criteria for designation of Special Areas and Particularly Sensitive Sea Areas.

Proposer: Maxine McCloskey, Defenders of Wildlife, 1244 19th Street NW, Washington, D.C. 20036, USA

Seconder: P.H.C. Lucas, 1/268 Main Road, Tawa 6006, Wellington, New Zealand

14. Whale Sanctuary in the Southern Ocean

A majority of voting member nations of the International Whaling Commission (IWC), at its 45th meeting in Kyoto, Japan, in May 1993, supported the French government proposal that the Southern Ocean south of 40 degrees south latitude be designated as a sanctuary, in which commercial whaling would not be permitted for an initial period of fifty years under a specific provision of the International Convention for the Regulation of Whaling 1946. The IWC also resolved by a vote of nineteen to eight to endorse “... the concept of establishing a sanctuary in the Southern Ocean.” A formal decision on this matter will be made at the commission’s 46th Annual Meeting to be held in Mexico in May 1994. This will follow a special Working Group of Members meeting (21–25 February 1994) that will provide advice on relevant legal, political, ecological, geographical, managerial, financial, and global environmental issues.

Additionally, the IWC unanimously confirmed the continuation of the Indian Ocean whale sanctuary that protects some whale populations from commercial whaling on their breeding grounds. The General Assembly of the Global Legislators Organization for a Balanced Environment met in Tokyo, Japan, 30 August through 1 September 1993 and adopted an Action Agenda on Whaling that “... supports the proposal by the government of France to establish a circumpolar whale sanctuary in the Southern Ocean in order to guarantee the protection of at least one biological population of each of the great whale species which are globally distributed,” especially on the feeding grounds of these migratory species.

The proposal for a Southern Ocean sanctuary is harmonious with, and complementary to, other internationally agreed actions directed to the conservation of the Antarctic and surrounding ocean, including the Protocol on Environmental Protection to the Antarctic Treaty; designation by the International Maritime Organization of most of the Southern Ocean as a Special Area; the decision by the Commission for the Conservation of Antarctic Marine Living Resources to establish a precautionary quota for krill fishing; and consensus by the United Nations Conference on Environment and Development in June 1992 affirming the competence of the IWC as the " ... appropriate international organization for the conservation, management, and study ... " of whales.

The 5th World Wilderness Congress:

1. urges all IWC member states to support the proposal for a circumpolar whale sanctuary in the Southern Ocean; and
2. urges the World Conservation Union, at the 19th Session of its General Assembly, to be held in Buenos Aires, 17–26 January 1994, to reaffirm its support of the proposal for a circumpolar whale sanctuary in the Southern Ocean.

Proposer: Susan Alexander, Earth Island Institute, 300 Broadway, San Francisco, California 94133, USA

Seconder: Maxine McCloskey, Defenders of Wildlife, 1244 19th Street NW, Washington, D.C., USA

15. A Transboundary System of Protected Areas in the Northern Barents Sea

The northern Barents Sea area, including the northern part of Novaya Zemlya and the archipelagos of Svalbard and Franz Josef Land, is the last extensive wilderness remaining in Europe. Ecosystems in this area are still largely self-regulating, and their structure has not been extensively modified by humankind.

Both the marine and terrestrial ecosystems of the northern Barents Sea region are critically dependent on the productivity and biodiversity of the marginal ice zone. Protection strategy for the northern Barents Sea area must, therefore, focus on measures to protect this partly ice-covered mobile belt that lies in a zone between continuous ice and the open sea.

The marginal ice zone and tundra areas are especially vulnerable to the impact of oil and gas development, mining, shipping, and military activities. Offshore oil and gas activities in the Barents Sea are rapidly expanding into areas with seasonal ice cover. No adequate technologies exist to manage major oil spills in waters with floating ice.

The inclusion of marine habitat in an expanded Arctic protected-area system is a matter of urgency, as nearly all existing protected areas in the Arctic are terrestrial. Protection of marine habitat in the Arctic Ring of Life should, therefore, receive the necessary governmental attention through national protection strategies, through bilateral cooperation, and internationally through the Conservation of Arctic Flora and Fauna program of the Arctic Environmental Protection Strategy. A transboundary protected-area system in the northern Barents Sea has the potential to serve as a good example of international cooperation and marine habitat protection in the Arctic Ring of Life.

The 5th World Wilderness Congress:

1. urges the Russian and Norwegian governments to develop a transboundary system of marine and terrestrial protected areas in the northern Barents Sea region; and
2. requests that the Russian and Norwegian governments jointly act to protect the marine and terrestrial ecosystems of the northern Barents Sea area while paying special attention to the ecological processes of the marginal ice zone, the vulnerability of these processes to large-scale industrial development, and the unique wilderness qualities of the area.

Proposer: Fredrik Theisen, Norges Naturvernforbund, Box 2113 Grünerløkka, N-0505 Oslo, Norway

Seconder: Robin Buzza, Arctic Wilderness Experience, Post Box 110, N-9170 Longyearbyen, Norway

THREATS TO PROTECTED AREAS

16. Safeguarding Internationally Designated Protected Areas from the Threat of Mining

The 4th World Wilderness Congress recommended that representative samples of the world's major ecosystems be protected to ensure the preservation of the full range of biological diversity and wilderness. At the 5th WWC, attention was drawn to the threat of mining facing a number of internationally significant protected areas, including at least one site designated under the Ramsar Convention. Drastic exploitation such as large-scale mining threatens irreversible change to natural systems and prejudices the long-term benefits that protected areas and associated ecotourism can provide.

For example, the Greater St. Lucia Wetland Park has recently been established in South Africa and incorporates the St. Lucia Game Reserve (established in 1895 to protect Lake St. Lucia). This area includes extensive

wetlands and terrestrial and marine ecosystems that contain natural communities not protected elsewhere in the Mozambique Plain. High levels of biodiversity are present, and a substantial wilderness core exists within the park. Much of the park is designated as a Wetland of International Importance under the Ramsar Convention.

A mining proposal has been lodged with the South African government for the southern portion of the park. A recently completed Environmental Impact Assessment (EIA) predicts that the proposed mining will not have an adverse effect on the biological diversity in adjacent ecosystems within the park or on the wilderness character of the central core. However, the findings of the EIA are based on research carried out over a relatively short period of time.

The 5th World Wilderness Congress:

1. requests all nations to ensure that protected areas designated under international instruments are not subjected to destructive forms of exploitation such as mining;
2. urges the South African government not to permit mining within the Greater St. Lucia Wetland Park and Ramsar Site unless, and until, more detailed and long-term EIA research can categorically demonstrate that the proposed mining can be undertaken without ecological degradation; and
3. recommends that the South African government undertake an extensive search for alternative mining sites where mining would have no impact upon designated protected areas.

Proposer: E.A. Zaloumis, Wildlife Society of Southern Africa, Wilderness Action Group

Seconder: Ian Player, Founder, Wilderness Leadership School, P.O. Box 53058, Yellowwood Park 4011, Natal, Republic of South Africa

17. Maintenance of Wilderness Areas

Significant progress has been made in establishing transboundary wilderness areas. These afford protection to the natural environment without regard to political boundaries and serve as important and effective examples that adjacent governments share wilderness values and cooperate in maintaining them. An important example is the Quetico-Superior Ecosystem, a complex of wilderness lands and lakes in Ontario, Canada, and Minnesota, United States, totalling 1,000,000 hectares. A key part of this complex is Quetico Provincial Park in Ontario, consisting of 475,000 hectares and classified as a *wilderness park*, the highest protection category.

Under pressures for economic development, including assistance to the expansion of the tourist industry to benefit the Lac La Croix people who live to the west of Quetico Park, the Ontario government is considering a change of policy to allow float aircraft and motor boats in the western one-third of the park, including international boundary lakes. This action would significantly degrade the wilderness character of the entire Quetico-Superior Ecosystem and amount to declassification of the legally designated wilderness category of a significant portion of the park. Quetico-Superior Ecosystem wilderness and Quetico Provincial Park are important and significant examples of international wilderness area issues, problems, and management opportunities. Without infringing upon the rights of international authorities to make decisions about the classification and management of their own territories, the questions of classification and development, on one hand, or protection of international wilderness areas, on the other, needs to be addressed in a wider international context.

The 5th World Wilderness Congress:

1. urges the Ontario government not to open the Quetico Provincial Park to float aircraft and motor boats; and
2. urges the Ontario government to pursue, in consultation with members of the Lac La Croix First Nation, alternative programs that will not degrade the wilderness character of Quetico Provincial Park and the Quetico-Superior Ecosystem.

Proposer: Kevin Proescholdt, Friends of the Boundary Waters, 1313 5th Street SE #329, Minneapolis, Minnesota 55414, USA

Seconder: Edgar and Peggy Wayburn, Sierra Club, 730 Polk Street, San Francisco, California 94121, USA

C. DEFINITION AND ASSESSMENT OF WILDERNESS

18. Definition of Wilderness

The 5th World Wilderness Congress has shown the multiplicity of approaches to wilderness—philosophical, spiritual, cultural, scientific, and others. All are equally valuable. Wilderness means different things to different people and cultures. This is both its strength and weakness; its strength because of the diverse array of interests it attracts and displays; its weakness because it has no unambiguous, standard, or widely accepted definition. Clarity is essential in reinforcing the long-term security of wilderness.

So long as wilderness remains an ill-defined concept, it will lack the political credibility it deserves. Resource planning inevitably gives greater recognition to features that can be measured and mapped. There is an urgent need to reinforce the definition of *wilderness*. Measurable objective criteria for its identification are required to reinforce its conservation status, particularly in developing countries. It is, for example, no accident that the concept of wilderness is not incorporated in the text of the Biodiversity Convention, where it is relegated to Annex 1.

The need to identify wilderness on the basis of measurable scientific criteria does not detract from its philosophical or spiritual values, nor does it conflict with the resource-use rights or livelihoods of indigenous peoples. The motivation is to provide wilderness with a definable geographical basis that enables it to become a more effective tool in conserving its many diverse values through defining wilderness areas, monitoring wilderness loss, refining wilderness management, and predicting the effects of potential development upon wilderness.

The current World Conservation Union (IUCN) classification of protected-area categories includes a wilderness category based on management criteria. However, under the IUCN system, the wilderness category can only be applied to areas that have already been designated as protected areas. There is an additional need to develop objective criteria to identify and map all wilderness areas. The increasing pressures upon the world's remaining wildlands, especially in developing countries, and the fact that only a small proportion of the world's wilderness actually lies within protected areas (e.g., less than 10 percent in Africa) heightens this imperative.

The 5th World Wilderness Congress:

1. encourages the IUCN to elaborate its management criteria for wilderness as soon as possible, including the unique cultural values of areas to indigenous peoples, and present these criteria to the IUCN General Assembly in Buenos Aires in January 1994;
2. recommends that the IUCN establish a small working group for the further elaboration of objective and measurable criteria for the identification of all wilderness areas. Such criteria might include relative naturalness of the land cover, remoteness, size, and human population density;
3. encourages, subject to the availability of the necessary resources, the World Conservation Monitoring Center (WCMC) and other similar institutions to map wilderness worldwide and prepare analyses of its status, distribution, and biogeo-

graphic-region representation as may be needed to support efforts for its protection;

4. requests funding agencies, including both governmental and nongovernmental organizations, to provide the financial support required for the working group, the IUCN, the WCMC, and other participating institutions to complete this work; and
5. requests the working group to present a report at the 6th WWC on progress made in defining and mapping wilderness.

Proposer: Harold Eidsvik, Commission on National Parks and Protected Areas, IUCN, 20 bis rue Jean Grandoux, Paris, France

Secunder: Vance Martin, President, The WILD Foundation, 2162 Baldwin Rd., Ojai, California 93023, USA

19. *The Australian Wilderness Inventory*

The Australian continent contains a great diversity of lands and ecosystems, and Australians have become world leaders in the promotion of the international instruments for environmental protection.

The 5th World Wilderness Congress:

1. acknowledges the leadership that the Australian government and wilderness groups have shown in developing the National Wilderness Inventory and recognizes its methodologies as important tools applicable to a wide range of ecosystems for the identification and assessment of wilderness quality;
2. congratulates the Australian government on its continued funding of the Australian National Wilderness Inventory, thereby making an important contribution to biological conservation worldwide;
3. recommends that, in anticipating completion of the National Wilderness Inventory in 1994, the Australian government create a register of Australian wilderness areas, implement a code for their management in consultation with aboriginal and Torres Strait Islander landowners, and enact legislation to provide long-term protection for areas included on the register; and
4. urges the Australian government to explore opportunities to apply the methodology developed by the National Wilderness Inventory to the identification and assessment of wilderness in other countries.

Proposer: John Hendee, Dean, College of Forestry, Wildlife, and Range Sciences, University of Idaho, Moscow, Idaho 83843, USA

Seconder: P.H.C. Lucas, 1/268 Main Road, Tawa 6006, Wellington, New Zealand

20. *Wilderness Legislation in the Arctic*

Wildland areas and values are increasingly seen as vitally important world elements and are under a growing threat from many sectors. The biological, scientific, economic, and spiritual values of wilderness are relevant to both industrial societies and traditional and subsistence communities. Finland has adopted a Wilderness Reserves Act that seeks to coordinate the needs and interests of indigenous peoples of its northern wilderness with those of forestry, recreation, and science.

The 5th World Wilderness Congress:

1. welcomes the foresight, innovation, and initiative of the Finnish people and government in adopting the Wilderness Reserves Act;
2. recognizes the act as an example from which can be drawn valuable insight and information for further wilderness law and policy throughout the Circumpolar North; and
3. requests relevant ministries, nongovernmental organizations, and research and management organizations of all circumpolar nations and regions to develop wilderness legislation for protection of cultural, biological, and scientific wilderness values and for provision of the cultural needs and subsistence practices of indigenous peoples.

Proposer: Vance Martin, President, The WILD Foundation, 2162 Baldwin Rd., Ojai, California 93023, USA

Seconder: Wilderness Foundation, Republic of South Africa

D. INDIGENOUS PEOPLES' ISSUES

21. *Strategy for Ecological and Cultural Sustainability in the Arctic*

The Arctic is a complex ecosystem and the least disturbed biome in the Northern Hemisphere. Indigenous and local peoples are an integral part of the Arctic.

Commercial interests regard the Arctic as the last frontier for large-scale industrial development of oil, gas, and mineral resources. Others seek to

experience it as the “last great wilderness.” However, for the indigenous peoples of the Arctic, the circumpolar region is their ancestral homeland. Arctic indigenous peoples have a distinctive and profound spiritual and cultural relationship with their physical environment that can provide valuable lessons for the rest of the world.

No comprehensive management regime or binding agreement among the Arctic nations currently exists to guide the development of resources in a manner that protects the environment and ensures equitable and sustainable resource utilization for indigenous peoples of the region. In an effort to prompt timely action, the Inuit Circumpolar Conference initiated the development of principles for a comprehensive Arctic policy, which they adopted in 1992. The policy was endorsed by the Nordic Sami Council and other Arctic indigenous peoples’ organizations.

The traditional ecological and environmental knowledge of Arctic indigenous peoples, and their direct and meaningful participation in decisions affecting their homelands, their livelihoods, and those of future generations must be central components of Arctic conservation and development policy.

The 5th World Wilderness Congress:

1. affirms the determination of the IV World Congress on National Parks and Protected Areas, held in Caracas in February 1992, that the establishment and management of protected areas and the use of resources in and around them must be socially responsible and just, particularly supporting the preferential right of Arctic indigenous peoples to utilize the resources of the Arctic in a sustainable manner compatible with conservation objectives;
2. recommends that the World Conservation Union (IUCN) continue to pursue the policy of its Perth General Assembly Recommendation 18.16, which recognizes the role of indigenous communities, and that of Recommendation 18.24, which recognizes sustainable wildlife use;
3. requests that the IUCN within available resources, appoint an Arctic Task Force to facilitate the design of a comprehensive resource management strategy that applies the principles of the 1991 Caring for the Earth, and build upon the substantial work already done by the Inuit Circumpolar Conference in its Principles and Elements of a Comprehensive Arctic Policy and the Inuit Regional Conservation Strategy; and
4. urges delegates to promote implementation of Chapter 26 of Agenda 21 of the Rio Earth Summit.

Proposer: Evelyn Hurwich, Circumpolar Conservation Union, 312 5th Street SE, Washington, D.C. 20003, USA

Seconded: Caleb Pungowiyi, Inuit Circumpolar Conference, 3201 C Street #608, Anchorage, Alaska 99503-3934, USA

22. The Rights of Indigenous Peoples to Safeguard the Integrity of the Arctic Environment

Indigenous peoples are diverse peoples with distinct cultures, languages, lands, resources, traditions, and laws. They possess the same rights as all other peoples under international human rights standards, including the right of self-determination. One aspect of this is the right of indigenous peoples to self-government. As members of the international community and in collaboration with state representatives, indigenous peoples are committed to exercising their self-government rights to preserve, strengthen, and develop their cultures and recover their rights to control their lands, resources, and wildlife.

The universality and indivisibility principles of human rights require that indigenous peoples be recognized as holding the right of self-determination as expressed in Article 1 of the International Covenant on Economic, Social, and Cultural Rights and Article 1 of the International Covenant on Civil and Political Rights. International indigenous rights are further elaborated in the International Labor Organization's Indigenous and Tribal Peoples Convention 169 and in the Draft Universal Declaration on the Rights of Indigenous Peoples as revised in August 1993.

To effectively exercise their responsibility as custodians of the Arctic wilderness, indigenous peoples require the legal recognition of their right to self-determination. Given this recognition, indigenous peoples will be able to manage Arctic resources for sustainable use, thus safeguarding the integrity of the Arctic environment.

The 5th World Wilderness Congress:

1. calls upon all nations to recognize indigenous peoples as the custodians of the Arctic wilderness with the right to full participation in decision-making bodies having authority in any Arctic region;
2. calls upon all nations, in particular the Arctic nations of Canada, Denmark, Finland, Iceland, Russia, Sweden, and the United States, to follow the commendable lead of the Norwegian government and promptly ratify the International Labor Organization's Indigenous and Tribal Peoples Convention 169; and

3. requests that the United Nations and its associated bodies promote and ensure that fundamental human rights and freedoms, including equal rights among people, are incorporated in the Universal Declaration on the Rights of Indigenous Peoples.

Proposer: Caleb Pungowiyi, Inuit Circumpolar Conference, 3201 C Street #608, Anchorage, Alaska 99503-3934, USA

Seconded: Leif Halonen, Nordic Sami Council, Lulit Gahkorluodda 8, N-9520 Kautokeino, Norway

E. SUSTAINABLE USE OF RESOURCES

23. Sustainable Use of Marine Mammals by Indigenous Peoples

Marine mammals comprise a major component of cold-water ecosystems. Coastal peoples have depended on the hunting and utilization of these resources for their social, economic, cultural, and nutritional needs, a situation that continues today and will continue as long as these regions remain the home of the descendants of these peoples. Over many generations, local residents have developed detailed traditional knowledge about the environment and its resources, knowledge that scientists, governments, and management agencies in these regions find to be essential components of sustainable and equitable utilization and management.

There are a number of international agreements that assert the rights of local peoples to a secure livelihood and the right to use resources in a sustainable manner. These rights are under threat from diverse government and nongovernmental organizations that oppose the harvesting of marine mammals and marketing of their products.

The 5th World Wilderness Congress:

1. recommends that governments and environmental organizations avoid any actions that threaten the rights of Arctic residents to utilize marine mammals on a sustainable and equitable basis; and
2. recommends that in recognition of the cultural and economic rights of Arctic residents, actions that abrogate these rights be repudiated and that greater sensitivity be shown to all peoples' right to choose their own livelihood in accordance with national and international laws.

Proposer: Amalie Jessen, Indigenous Survival International, P.O. Box 269, 3900 Nuuk, Greenland

Secunder: Caleb Pungowiyi, Inuit Circumpolar Conference, 3201 C Street #608, Anchorage, Alaska 99503-3934, USA

24. Precautionary Approach to Fisheries Management

The viability of marine ecosystems and the security of global food production are threatened by the impact and management of fishing in all the world's oceans, especially in the high seas and northern waters. The world's fish catch is declining. This clearly demonstrates that present fisheries management systems are not maintainable.

The most obvious cause of this decline is overfishing. This has been clearly manifest for the North Atlantic cod stocks and in the fishing grounds off Iceland, Canada, Greenland, and Norway.

Management must address the impact of fisheries on target species, incidentally caught species, and the viability of the entire ecosystem. Fisheries management procedures must make adequate allowance for inherent uncertainties such as environmental variability and recruitment fluctuations. Additionally, management objectives must be clearly specified and give priority to the precautionary approach to marine resource conservation.

The 5th World Wilderness Congress:

1. urges delegates to influence the international community, particularly the ministers of circumpolar countries, international fisheries bodies, and the commercial fishing industry, to accept the need for an alternative approach to fisheries management that follows the principle of precautionary action to protect both commercial fish stocks and the entire marine ecosystem; and
2. urges the implementation of binding measures for the management of fisheries through the United Nations Conference on Straddling and High Migratory Fish Stocks, including adequate provisions for the traditional fisheries of indigenous peoples.

Proposer: Kirsten Sander and Michael Earle, Greenpeace International, Linnesgade 25, DK-1361 CPH.K, Denmark

Secunder: Edgar Wayburn, Sierra Club, 730 Polk Street, San Francisco, California 94121, USA

F. POLLUTION AND DEVELOPMENT ISSUES

25. Global Action to Protect Arctic Marine Ecosystems from Climate Change and Transboundary Pollution

The long-term health of the oceans and coastal areas and the diversity of marine plant and animal life are critical to all life on Earth. The Arctic is a unique and sensitive ecosystem of vital importance in stabilizing the global climate. Its environment is especially slow to recover from the adverse effects of human activities and, therefore, requires special protective measures.

Globally, there is already a significant increase in the concentration of atmospheric greenhouse gases from the production and burning of fossil fuels. The reduction in ice area and thickness, which may be an indication of climate change, is already happening in the Arctic. Its ecosystems contain significant amounts of greenhouse gases—predominantly methane—which may be released by the warming climate, exacerbating climate change. Thus, the immediate implementation of the agreement, signed by the world's governmental representatives at the Rio Earth Summit, of a Framework Convention on Climate Change, which called for the curbing of emissions of greenhouse gases to prevent climate change, is essential.

Arctic ecosystems are vulnerable to pollution from chemicals such as organochlorines and radioactive substances. The levels of toxic human-made chemicals, particularly organochlorines, found in animals at the top of the food chain, such as polar bears and glaucous gulls and the chemical burden suffered by the indigenous peoples of the Arctic have all been well documented.

The Arctic region is threatened by pollution from existing deposits and from the continued dumping of radioactive materials. There are plans to increase the emissions and discharges of radioactive substances from countries adjacent to the Arctic region. Therefore, the proposal in the London Convention (1972) to ban the dumping of all radioactive substances needs the full support of all Arctic countries and peoples. We also note the decision of the northern countries that the oceans should not be treated as dumping grounds (Nordic Council International Arctic Conference, August 1993). Any increase in emissions or discharges of radioactive materials and toxic chemicals should be avoided in accordance with the principle of precautionary action.

The 5th World Wilderness Congress:

1. calls upon delegates to demand the highest regulatory standard for current oil and gas exploration, production, and transport in the Arctic, especially in ice-covered seas, and to

- encourage industry and government to redirect investment away from further oil and gas exploration in the Arctic and toward efficient energy use and the generation of renewable energy supplies that do not threaten to alter the world's climate;
2. urges delegates to influence the international community, particularly the ministers of circumpolar countries, to implement binding measures for reducing the input of toxic chemicals, especially organochlorines and radioactive materials, into fresh water and marine ecosystems as agreed to by national and international forums such as the Paris Commission, the International Joint Commission for the Great Lakes, and the London Convention;
 3. recommends delegates to support the commitments made at the Río Earth Summit for the negotiation of a Global Convention on Land-Based Sources of Marine Pollution; and
 4. urges delegates to ensure that the action program to be debated at the intergovernmental conference in Washington, D.C., United States, in November 1995, will include strategies to reduce input of radioactive materials and toxic chemicals, particularly organochlorines, into the marine ecosystems.

Proposer: Kirsten Sander and Bob Edwards, Greenpeace International, Linnesgade 25, DK-1361 CPH. K, Denmark

Secunder: Pamela Miller, Wilderness Society, 430 West 7th Avenue #21, Anchorage, Alaska, USA

26. Radioactivity in the Northern Environment

Information available so far indicates that current levels of radionuclides in northern seas do not pose a threat to human health or the environment. There is deep concern, however, with regard to the risk of potential releases of radionuclides from sources dumped in places like the Kara Sea and the Sea of Okhotsk, from inland sources like Mayak in western Siberia, from other unsafe repositories for nuclear waste, and from possible accidents at any of the numerous civil and military nuclear facilities in or near the Arctic. The potential risk of radioactive contamination is among the most significant threats to Arctic wilderness.

The possibility of continued nuclear testing in the Arctic is an additional cause of deep concern. It is to be hoped that the positive developments in the international political arena in recent years will be accelerated and will bring about an early termination of the nuclear arms race.

The 5th World Wilderness Congress:

1. urges the Russian Federation governments to permit, without delay, inspection of all sites where radioactive wastes have been dumped in northern waters in order to assess the future risk of radioactive contamination of the marine environment;
2. urges the Russian Federation governments to ensure that no further disposal of radioactive waste or material be made in Arctic waters and that action be taken to restrict the flow of radioactive materials through rivers and ground water;
3. urges the Russian Federation governments and appropriate international organizations to actively cooperate to safeguard the handling and storage of nuclear wastes in order to prevent future radioactive contamination of the environment, particularly that the G-7 governments extend their assistance to the Russian Federation for safe storage of nuclear waste; and
4. urges the Russian Federation governments and the world community to work towards an immediate and lasting moratorium on nuclear test explosions in the Arctic.

Proposer: Bjørn Odd Frantzen, Coordinating Committee on Northern Issues, Norway

Seconder: Pål Prestrud, Ministry of the Environment, Oslo, Norway

27. A Precautionary Strategy to Protect the Arctic Environment

Areas of undisturbed nature in the Arctic are important to the conservation of global biodiversity. Sustainable harvesting of biological resources in the Arctic is dependent on the preservation of this diversity.

Industrial development, including exploitation of oil and gas, hydroelectric power, minerals, and forests are major threats to biodiversity and biological productivity in the Arctic. Severe local environmental degradation has already occurred as a result of such activities, particularly in the Russian Arctic.

These threats must be met by a common strategy to prevent deterioration of Arctic biodiversity, productivity, and cultural values. The precautionary principle must be the core element of this strategy. Such a strategy is embodied in the objectives of the Arctic Environmental Protection Strategy (AEPS) to which governments of all eight Arctic countries committed themselves in 1991 and which was reaffirmed in the Nuuk Declaration of September 1993, and which was further reinforced at the Nordic Council International Arctic Conference, held in Reykjavik in August 1993.

The 5th World Wilderness Congress:

1. recommends that the Arctic countries together with the local indigenous peoples and their organizations develop a common strategy based on the AEPS and the Reykjavik declaration and embodying the precautionary principle to avoid new large-scale environmental deterioration resulting from local developments;
2. requests all arctic countries to establish a comprehensive system of protected areas to safeguard the biodiversity of polar ecosystems from the impact of local developments; and
3. requests that, in accordance with the Reykjavik Declaration, thorough and comprehensive Environmental Impact Assessment studies be an integral part of all economic planning and activities.

Proposer: Fredrik Theisen, Norges Naturvernforbund, Box 2113 Grünerløkka, N-0505 Oslo, Norway

Seconder: Vance Martin, President, The WILD Foundation, 2162 Baldwin Rd., Ojai, California 93023, USA

28. *Protection of the North Pacific Marine Ecosystem*

A significant portion of the North Pacific marine ecosystem along 1,500 kilometers of coastline was seriously damaged by the massive *Exxon Valdez* oil spill in Prince William Sound in 1989. Restoration of the damaged habitats requires protection of the coastal temperate rain forest bordering Prince William Sound and the rest of the oil-affected area.

Approximately U.S.\$1.25 billion has been made available through the *Exxon Valdez* Oil Spill Trustees Council for the restoration of the affected habitat. Much of this sum has yet to be allocated. It is essential that restoration of the coastal habitat and protection of the regional marine ecosystem be achieved as soon as possible and before the forests are destroyed by logging.

The Governor of Alaska expressed his commitment to restoring the area damaged by the *Exxon Valdez* oil spill. The U.S. government has likewise pledged to contribute to the cleanup and restoration. However, negotiations between the Trustees Council and local interests are presently stalled.

The 5th World Wilderness Congress:

1. urges that negotiations between the *Exxon Valdez* Oil Spill Trustees Council and local interests, including Alaska native

landowners of critical and vulnerable areas, proceed actively to release funds for restoration and protection of the Prince William Sound coastal area and the North Pacific marine ecosystem as soon as possible.

Proposer: Edgar and Peggy Wayburn, Sierra Club, 730 Polk Street, San Francisco, California 94121, USA

Seconded: Pamela Miller, Wilderness Society, 430 West 7th Avenue #21, Anchorage, Alaska, USA

G. MATTERS OF INTEREST

29. *Matters of General Interest and Concern*

The Resolutions Committee received several submissions on matters of general interest and concern about the subject area and objectives of the World Wilderness Congress (WWC), but which, in the opinion of the committee, did not directly relate to the major themes of the congress or symposia, and thus did not qualify as resolutions. The WWC wishes to recognize the following matters:

1. *Impact of Human Population Growth*—The explosive growth of the human population is the basis of most current and impending future environmental problems. It is the responsibility of public authorities and religious movements to do all in their power to encourage and support appropriate means for reducing continued human profligacy.
2. *Environmental Prizes*—Environmental degradation and progressive reduction or impairment of natural living resources and life support systems is a major cause of social instability and a threat to world peace, and outstanding contributions to environmental improvement and the spread of environmental awareness should be recognized as important contributions to world peace. The WWC hopes that the Committee for the World Peace Prize may henceforth include, in its consideration of nominated candidates, the contributions of those who have served the world through the cause of environment and nature. The WWC also welcomes suggestions being made to the Nobel Prize Committee with respect to a possible Environmental Prize that would serve to recognize outstanding environmental achievement and draw attention to environmental issues.

3. *Environmental Special Days*—Proclaimed “special days” may play a useful role in focusing public attention and community action on matters of shared concern and the appropriateness of three well-recognized global environmental celebrations: Earth Day in the northern spring regions, Environment Day in the northern summer regions, and the proposed Biosphere Day in the northern autumn regions (with seasons correspondingly reversed in the Southern Hemisphere). The WWC delegates may wish to encourage endorsement and enhancement of these celebrations. They may further wish to support the intended fund, prizes, and clubs proposed for Biosphere Day. (See *Environmental Conservation*, vol. 19, p. 193 and vol. 20, p. 3.)
4. *Youth Network*—Electronic mail information networks for young people present a unique opportunity for sharing knowledge and resources among diverse groups. However, the accessibility and scope of such networks is limited. A number of young adults involved in the 5th WWC are working to expand and link these networks so as to internationally generate more connections.

The purpose of this network will be to link young persons and youth organizations worldwide to assist one another in achieving common goals of ecological protection, sustainable living, and social progress. The network will provide opportunities for local groups and organizations to form an international community that can exchange progress reports, event updates, and ideas and information on sustainable living. Users will share technologies and develop the capabilities to bring together resources where they are needed most. Youth groups that have been isolated will be able to gain a broader perspective. The support and assistance of the WWC for young people with interests in wilderness would help development of the network.

Proposer for 1, 2, and 3: Nicholas Polunin, President, Foundation for Environmental Conservation, 7 Chemin Taverney, 1218 Grand-Saconnex, Geneva, Switzerland

Seconders for 1, 2, and 3: Valene Smith, Vance Martin, Michael McCloskey, Maxine McCloskey, Egil Sakshaug, and Thor Heyerdahl

Proposer for 4: Heidi Sørensen, Nature and Youth, Torggt. 34, 0183 Oslo 1, Norway

Secunder for 4: Angela Biegewald, 4761 35th NE, Seattle, Washington 97105, USA

H. FUTURE WORLD WILDERNESS CONGRESSES

30. *The 6th World Wilderness Congress*

The 5th World Wilderness Congress has demonstrated a welcome multiplicity of different approaches to wilderness—spiritual, philosophical, cultural, scientific, economic, and others. All are equally relevant and valuable. It is precisely this broad-based multidisciplinary character that makes wilderness such a powerful force and which underlines the rationale and need for such a congress.

Building on the undoubted success of this congress, delegates look forward with enthusiasm to the 6th WWC. The gathering momentum and commitment of all participants provides the motivation to ensure that this series of congresses is continued in the future. In view of the fact that all previous congresses have been held in industrialized countries, it is timely and appropriate that the next congress be convened in the developing world.

The need for the WWC series is given greater imperative by the realization that the pressures of people and development will inevitably accelerate the rate of loss of the remnants of the world's wilderness. The WWC addresses issues of fundamental importance for the spiritual, cultural, and material well-being of humankind and must, therefore, be given the highest possible profile in the future.

The 5th World Wilderness Congress:

1. recognizes the outstanding success of this congress and thanks the Governing Board and Program Committee for their substantial efforts in creating this success;
2. proposes that the WWC series be continued and convened not more than four years apart;
3. urges that young people have a greater involvement in the planning and organization of future congresses and are encouraged to attend as delegates. Young people from diverse backgrounds should be actively encouraged to participate in the formulation of the program and in the presentation of papers at both plenary and symposia sessions. A concerted effort should be made to secure the necessary funds to enable young people from all countries and backgrounds to attend;
4. urges the 6th WWC to give emphasis to the role of women in the protection and management of wilderness resources and values;
5. requests the 6th WWC to increase its focus on science concerning wilderness issues, including a plenary session on

- identifying research needs for wilderness, wildlands, and other protected areas. Biological, social, physical, and cultural values should be a framework for this expansion;
6. urges the 6th WWC to continue the systematic structuring of the program so that sectoral themes and approaches are addressed in a cohesive way (e.g., scientific, philosophical, and cultural). Plenary presentations should be allocated significant time to enable speakers to give a more comprehensive overview of their topics;
 7. encourages 6th WWC symposia conveners to strive to achieve a balanced representation of nationalities so that a diverse array of backgrounds and experiences can contribute to the debate;
 8. recognizes that a novel and successful feature of the 5th WWC was its having a specific theme, *Wild Nature and Sustainable Living in Circumpolar Regions*, and, therefore, recommends that future congresses likewise adopt a clear central theme; and
 9. urges that the 6th WWC be held in a developing country, particularly one that is showing a commitment to wilderness conservation.

Proposer: Resolutions Committee, 5th World Wilderness Congress, Tromsø, Norway

Seconder: Nicholas Tyler, University of Tromsø, Tromsø, Norway

Proposer for 5: Alan Ewert, USDA Forest Service

Seconder for 5: Edwin Krumpe, University of Idaho



APPENDIX: RESOLUTIONS PROCEDURE— GUIDELINES FOR DELEGATES

These guidelines describe the constitutional arrangements and mechanism of the Resolutions Procedure adopted by the 5th World Wilderness Congress (WWC). They are modelled on the procedure used at the World Conservation Union General Assembly. The object of these guidelines is to inform WWC delegates how, when, and in what form to submit a resolution proposal on polar wilderness conservation. They also describe the Resolutions Committee procedure for selecting and accepting proposals on behalf of the WWC.

The resolutions procedure consists of ten steps:

1. sponsorship of a proposal;
2. submission of proposals to the Resolutions Committee;
3. the committee's review and revision of proposals, in which modified proposals are returned to sponsors for comment;
4. dialogue between sponsors and the Resolutions Committee;
5. publication of proposals for delegate criticism;
6. review of delegate comments;
7. the committee's final hearing of sponsors;
8. the committee's closed-session preparation of resolutions;
9. presentation of resolutions to congress in plenum; and
10. submission of resolutions to the Chairman of the Governing Board.

RESOLUTIONS PROCEDURE

- *Sponsorship of Proposals*—An individual delegate (or his/her affiliated institution, if appropriate) may propose a resolution. Each proposal must be submitted to the World Wilderness Congress Secretariat in writing and must include the name and address (both during and after the congress) of its sponsor and a seconder who must hold a different affiliation. Proposals must also be brief.
- *Resolutions Committee*—The Governing Board of the 5th WWC appointed a Resolutions Committee, which has the mandate and authority to review, revise, merge, modify, and ultimately select or reject proposals, according to specific criteria, as it sees fit. The committee is also empowered to independently draw up resolutions based on its evaluation of lectures and debates at the congress.

The 5th WWC Resolutions Committee consisted of:

- Paul Dingwall (Chairman), Vice-Chair, Commission on National Parks and Protected Areas, World Conservation Union;
- Lars Anders Bær, Vice President, Nordic Sami Council;
- Dr. Robin Pellew, Director, World Conservation Monitoring Center (UK);
- Dr. Pål Prestrud (Secretary), Ministry of the Environment, Norway;
- Dr. Peter Prokosch, World Wide Fund for Nature (International);
- Dr. Fred Roots, Scientific Advisor Emeritus, Department of the Environment, Canada; and
- Ms. Elin Pierce (secretary to the committee), University of Oslo.

Eligibility of Proposals

For a proposal to receive consideration by the Resolutions Committee, it must:

1. be submitted in writing;
2. bear the names and addresses of its sponsor and a seconder;
3. be properly drafted (guidance is available from the Resolutions Committee office);
4. be delivered within the appropriate deadline; and

5. it is suggested that proposals concern the major themes of the WWC as specified in the titles of the Global Wilderness Forum sessions, Convention of Delegates, and symposia. Additionally, proposals are discouraged that concern single species or genera and strictly local issues or particular sites, except where these are placed in an international context (e.g., legal, scientific, and management) relevant to the congress. If a proposal is a motion against any action, it should try to include an alternative suggestion for more positive action.

Schedule for Submission, Review, and Revision of Proposals

A specific schedule is set, the dates of which are relevant to the WWC meeting dates:

- Proposals are received by the World Wilderness Congress Secretariat and then forwarded to the Resolutions Committee.
- The committee meets and reviews proposals and return those that need further work to the Congress Secretariat, where sponsors may collect them. Draft proposals with the committee's comments are passed on to symposia conveners.
- Sponsors must resubmit modified versions of their proposals to the committee via the Congress Secretariat in writing. The committee will meet again the same evening to review the modified versions.
- All proposals that have been received and reviewed will be posted in public locations at the congress.
- Any delegate may submit written comments on posted proposals to the Congress Secretariat. All written comments must include the name(s) and address(es) (both during and after the congress) of their authors. The Resolutions Committee will meet that evening to review these comments and to prepare draft resolutions.
- The committee may hold final hearings with proposal sponsors. Hearings close at 3:00 P.M. The committee will then meet in closed session to prepare the final text of the resolutions.

Late Proposals

The committee may also accept late proposals, but maintains the right to reject those that do not meet the first deadline. Late proposals will not, however, be rejected out of hand. The committee may agree to entertain them as Additional Matters of Concern, if not as Resolutions of the Congress.

Plenary Procedure

The chairman of the Resolutions Committee will read the Resolutions of the Congress and Additional Matters of Concern to congress delegates at the Closing Plenary Session. The chairman, or other committee members, will briefly explain each in turn.

Finally, the Resolutions of the Congress and Additional Matters of Concern will be presented to the chairman of the 5th World Wilderness Congress Governing Board at the end of the Closing Session. The chairman will further present them to the president of the Board of Directors of the Northern Forum for deliberation at the General Assembly of the Northern Forum, which convened in Tromsø immediately following the 5th WWC. They will ultimately be published as Resolutions Adopted on Behalf of the 5th World Wilderness Congress.

Subsidiary Points

The Resolutions Committee prepared a summary of its conclusions as a press release. It further published a summary of its deliberations as a chapter in the final 5th World Wilderness Congress proceedings. Congress delegates were invited to present the committee, via the Congress Secretariat, with names and addresses of persons or institutions to which copies of the Resolutions of the Congress and Additional Matters of Concern should be sent.



AFTERWORD

It was a long and difficult process to plan and convene the 5th World Wilderness Congress (WWC). It is significant that supporting funds were raised and that the 5th WWC actually met during a severe financial recession in Norway. In the end, the 5th WWC provided a much-needed platform for stocktaking of knowledge and insights and an arena for identifying critical issues and problems that need to be tackled and ultimately resolved. The need to have wilderness and conservation placed at the center of the Arctic environment and development debate is of utmost importance, and the 5th WWC achieved strong results in this area.

The environmental issues before us are immensely complex; the 5th WWC helped prioritize them and, by relating each issue to the need for the continued existence of healthy wildlands, clarified the Arctic agenda for the diverse sectors involved. The presentations and action items tabled during the seven-day process were more far-ranging than at any previous Arctic conference and covered a multitude of approaches to wilderness protection, including scientific and intellectual, humanistic, historical, future-oriented, ethnic, local, regional, global, values-oriented and philosophical, political, and activist approaches. Within this multitude of approaches, the 5th WWC demonstrated that lack of accurate information alone is not the major obstacle to nature conservation. Significant culture-bound differences influence our concepts of wilderness and, therefore, affect how we act on its behalf.

Perhaps the most significant achievement of the 5th WWC is that we created a new avenue for all these important and unique approaches to be fairly heard and for wilderness to be recognized as a critical component of sustainable living in circumpolar regions.

—*Jostein Mykletun*
Vice Chair, Governing Board,
5th WWC (Norway)

Presenters and Organizational Structure



5TH WORLD WILDERNESS CONGRESS PRESENTERS

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BIOGRAPHICAL SKETCHES OF PRESENTERS

Thorbjørn Berntsen

Thorbjørn Berntsen attended the Officers' Training School from 1955 to 1956 and participated in several courses organized by the trade-union movement. He was a ship plumber at Nylands Shipyard from 1951 to 1966 and served as a leader of the Oslo Section of the Norwegian Union of Iron and Metal Workers from 1965 to 1966 and as the union's information secretary from 1967 to 1973. He has been a member of the Committee of Representatives in the Oslo Labour Party since 1962 and was chairman of this party from 1976 to 1982. Mr. Berntsen also served as chairman, and later deputy chairman, of the Oslo Municipal Consultative Committee for Trade and Industry from 1969 to 1983. Mr. Berntsen's other positions have included being deputy member of the Norwegian Parliament from 1970 to 1971, serving on the Standing Committee on Foreign and Constitutional Affairs and the Standing Committee on Industry; a member of the Norwegian Parliament from 1973 to 1990, serving on the Standing Committee on Local Government and Environment since 1973 and as a leader from 1989 to 1990; deputy leader of the Labour Party from 1989 to 1992; and author of the book, *Klar Tale: Fra Dokk til Ting* (1988). Mr. Berntsen has been the minister of environment for the government of Norway since October 1990.

Carola Bjørklund

Carola Bjørklund graduated from Oslo Law School in 1979 and joined the Norwegian Foreign Service in 1981. She was then assigned as Norwegian Vice Council in Minneapolis, Minnesota, from 1982 to 1984 and appointed secretary of embassy at the Norwegian Embassy in Washington, D.C., from 1984 to 1987. She has devoted the last six years to international environmental law in the Ministry of Foreign Affairs as senior executive officer, with the exception of 1990 to 1992 when she worked for the Ministry of Environment in the same field.

Paul Dingwall

Paul Dingwall is a senior scientist and policy analyst in the New Zealand Department of Conservation, based in Wellington, New Zealand. He has more than twenty years experience in conservation research, planning, and policy development with particular interest in the management of national parks and protected areas. Mr. Dingwall is also employed as a consultant to the World Conservation Union (IUCN) on protected areas and the conservation of Antarctica and is vice chair of IUCN's Commission on National Parks and Protected Areas. He is principal author of the IUCN's *Strategy for*

Antarctic Conservation (1991) and has represented the IUCN at Antarctic Treaty consultative meetings and at the special treaty meetings that negotiated the Protocol on Environmental Protection to The Antarctic Treaty. Mr. Dingwall has visited Antarctica and many of the sub-Antarctic islands as a government official and guide aboard a tourist cruise vessel.

Michael Earle

Michael Earle graduated with a bachelor of science degree in biology from the University of Guelph in Canada in 1979 and obtained a master of science degree there in 1986, researching the reproductive energetics of small mammals. Since 1987, he has worked for Greenpeace, at first in Vancouver, British Columbia, and now in Belgium. He is particularly interested in fisheries management, selectivity of fishing gear, and interactions between marine mammals and commercial fisheries.

Sigbjørn Eriksen

Sigbjørn Eriksen is mayor of Nordland County, currently serving in his third electoral period. Mayor Eriksen is vice foreman of the Northern Forum and a member of the Barents Regional Council and has been actively engaged in local and regional politics for about thirty years, representing the Labour Party.

Elizabeth Estill

Elizabeth Estill became regional forester for the Rocky Mountain Region of the USDA Forest Service (USFS) in Denver, Colorado, on 9 August 1992. As regional forester, she is responsible for the administration of over 22 million acres in seventeen national forests and seven national grasslands and is involved with the cooperative efforts of state and private landowners in Colorado, Kansas, Nebraska, South Dakota, and eastern Wyoming. Ms. Estill holds a bachelor of science and a master of science degree in biology from the University of Tennessee. She did postgraduate work at Harvard University as a Loeb Fellow in advanced environmental studies. Ms. Estill previously held the post of Associate deputy chief for the National Forest System. Prior to that, she was assistant director of Recreation and then director of Recreation, Cultural Resources, and Wilderness Management for the USFS in Washington, D.C. Ms. Estill came to the USFS from the Tennessee Valley Authority (TVA) in 1988. She also served as director of Land between the Lakes, a national recreation demonstration area in western Kentucky and Tennessee. Ms. Estill serves on the board of directors of the Pinchot Institute for Conservation, the Denver Federal Executive Board, and the Advisory Board of the Natural Resources Law Center at the University of Colorado School of Law; she also volunteers for Outdoor Colorado.

Mervin Franks

Mervin Franks is a Wakka Wakka from northeast Australia. He is a representative of the Aboriginal and Torres Strait Islander Commission.

Paul Fuhs

As Alaska's Commissioner of Commerce and Economic Development, Paul Fuhs is responsible for Alaska's business development and regulatory agencies. He has been an activist and organizer in resource development issues for many years, serving as founding president of several organizations, including Ports Alaska, the Alaska Mariculture Association, and the Southwest Alaska Municipal Conference. His past experience includes organizing workers for the International Longshoreman's Union and serving as owner-operator of a commercial diving company that specializes in the use of underwater explosives.

Silje Gamstøbakk

Silje Gamstøbakk is a teenage environmental activist who attends the Ole Vig Videregående Skole (an upper secondary school) in Stjørdal, Norway, where she is taking general studies classes. She spent one year in Costa Rica as an exchange student. Ms. Gamstøbakk has been a member of Nature and Youth for about five years, working with a wide range of local environmental problems. She also directs a youth club in Stjørdal and a local chapter of Ungdom Mot EF (Youth Against the EEC).

Dag Hareide

Dag Hareide is secretary general of the Norwegian Society for Nature Conservation. He holds a master of arts degree in sociology. His earlier work includes being a United Nations rehabilitation coordinator during the last famine in Ethiopia and a journalist, pastor, school principal, seaman, researcher, and youth worker.

John Hendee

John Hendee is dean of the College of Forestry, Wildlife, and Range Sciences at the University of Idaho in Moscow, Idaho. Dr. Hendee has written or cowritten more than one hundred articles reporting the results of his research on wilderness and natural resource management. He is senior coauthor of *Wilderness Management*, a college-level textbook now in its second edition, coauthor of *Wildlife Management in Wilderness*, and coauthor of the forthcoming McGraw-Hill textbook *Conservation and Management of Forest and Renewable Resources*. Dr. Hendee was vice chair for science for the 4th World Wilderness Congress and was cochair of the 5th WWC symposium on International Wilderness Allocation, Management, and Research.

Geir Hestmark

Geir Hestmark is a philosopher, biologist, and science historian. He currently teaches ecology and evolution in the Department of Biology at the University of Oslo.

Thor Heyerdahl

Thor Heyerdahl is a renowned explorer and author. He has published numerous popular and scientific books and received awards and honors throughout Europe and the Americas. Dr. Heyerdahl's most famous expedition was the Kon-Tiki Expedition in 1947. For 101 days, he and his five companions sailed from Peru to Polynesia in an open balsa raft such as was known to be in use about A.D. 500. The purpose of the voyage was to prove that Peruvian Indians could have made this voyage a thousand years before Christopher Columbus. The voyage was successful and Dr. Heyerdahl documented it in his modern classic, *Kon-Tiki*. Additional studies and explorations furthered the validity of his theory, and in 1955 he organized and led the Norwegian Archaeological Expedition to Easter Island and the East Pacific, where he carried out the first systematic excavations ever undertaken on Easter Island, Rapa Iti, and the Marquesas Islands. The adventures of this expedition and its fascinating discoveries are documented in *Aku-Aku*. Dr. Heyerdahl presently resides in Peru.

Walter Hickel

Governor Walter Hickel of Alaska chairs the Northern Forum, an organization of governors and leaders from fourteen arctic regions. As one of the founders of the group and as former U.S. Secretary of the Interior, Governor Hickel attended the United Nations Conference on the Human Environment in Stockholm in 1972 and the Río Earth Summit in 1992.

Vladimir Kalinnikov and Anatoly Vinogradov

Vladimir Kalinnikov and Anatoly Vinogradov are scientific colleagues at the Kola Science Center where Mr. Kalinnikov serves as president. Mr. Kalinnikov is also a professor of chemistry and a correspondent member of the Russian Academy of Sciences. He currently serves as director of the Institute for Chemistry and Technology of Rare Elements and Mineral Raw Materials in Apatity, Russia.

Bjørn Kaltenborn

Bjørn Kaltenborn is currently working as a research social scientist at the Norwegian Institute for Nature Research (NINA) on resource-based recreation and tourism. He previously served as head of NINA's research

group on recreation and tourism. He has extensive experience with research on tourism in the Arctic and has served as nature conservation Officer at the governor's office in Svalbard. Dr. Kaltenborn has also worked with nature conservation and information issues in the Ministry of Environment. He was formerly employed with the Department of Geography at the University of Oslo and conducted field research in Nepal, the United States, and Canada.

Rosemarie Kuptana

Rosemarie Kuptana is a spokeswoman for the Inuit Tapirisat of Canada, the national political voice of Canada's 35,000 Inuit peoples.

P. H. C. Lucas

P. H. C. (Bing) Lucas chairs the Commission on National Parks and Protected Areas of the World Conservation Union. Mr. Lucas was New Zealand's first director of national parks and later became director general of lands.

Ole Henrik Magga

Ole Henrik Magga is president of the Sami Parliament in Norway, professor at the Sami Teachers' Training College in Guovdageaidnu, Norway, and a member of the World Commission on Culture and Development, appointed by UNESCO and the United Nations General Secretariat. Mr. Magga is a specialist in Fenno-Jgrian languages.

Vance Martin

Vance Martin has been president of the WILD Foundation since 1983. He was named executive director of the International Center for Earth Concerns (ICEC) in 1994. Mr. Martin served as executive director of the 3rd and 4th World Wilderness Congresses (held in Scotland and the United States, respectively), and he currently directs projects overseas and at the ICEC. Mr. Martin graduated magna cum laude from West Virginia University in 1971, and since then he has lived and worked extensively outside of the United States. The WILD Foundation is based in Ojai, California, at the International Center for Earth Concerns, where Mr. Martin lives with his wife, Kate, a fibre artist, and their teenagers, Farren and Felicia.

Michael McCloskey

As chairman of the Sierra Club, Michael McCloskey is a senior spokesman and counselor for the group. He is particularly active in its international program and directs its Natural Value Mapping Project. He was trained in law and political science and has worked on the organization's staff for over

thirty-two years. For seventeen years, he served as its executive director and prior to that as its conservation director. He is also currently chairman of the Natural Resource Council of America and is an adjunct professor of public policy at the School of Natural Resources and the Environment at the University of Michigan.

Victor Mikhailov

Victor Mikhailov was born in 1936 in the Orenburg Region in the former Soviet Union. He first graduated from the Polytechnical College and later from the Moscow All-Union Polytechnical Institute with specialization in industrial and civil construction. Mr. Mikhailov dedicated much of his career as a construction engineer to domestic and industrial projects in the remote areas of the Magadan Region, serving as head of the Magadansel'stroy Region Agency and later as head of the Major Agency of Planning and Economy of Magadan Region. In 1985, he became the vice chairman of the Magadan Region Executive Committee and now serves as chairman of this committee. Mr. Mikhailov enjoys fishing and hunting in the Russian countryside. Wilderness is Mr. Mikhailov's first passion; classical music is his second.

Pamela Miller

Pamela Miller has been assistant regional director of the Alaska office of the Wilderness Society for two years. She came to Alaska in 1981 to work at Denali National Park. For eight years, she served the USDI Fish and Wildlife Service, six of them in Fairbanks, Alaska. As a wildlife biologist on the Arctic National Wildlife Refuge staff, she studied bird habitat use on the coastal plain. She reviewed the effects of oil development projects in Prudhoe Bay for the Ecological Services branch and was principal investigator for studies of contaminants in birds. She worked with the Alaska Coalition in Washington, D.C., and as Alaska legislative representative for the National Wildlife Federation. She has a master of science degree in journalism from the University of Oregon, completing a thesis on press coverage of the *Exxon Valdez* oil spill, and holds a bachelor of science degree in biology from Evergreen State College.

Bent Muus

Bent Muus was born in 1926 and holds his doctoral and master of science (1954) degrees in zoology. He worked with brackish-water faunas under Denmark's Fisheries Research from 1954 to 1967 and has made several marine biological expeditions in the North Atlantic and South East Asia. He has been professor of systematic zoology and zoogeography at the Zoological Museum at the University of Copenhagen since 1968. Dr. Muus served as

chairman of the Danish Nature Conservancy Board from 1971 to 1981 and as vice chairman of the World Wide Fund for Nature (Denmark) since 1980. He is currently chairman of the board of Copenhagen Zoo and a member of the board of East Greenland National Park.

Jan Henry Olsen

Jan Henry Olsen serves as minister of fisheries in the Royal Norwegian Government. Although he was born in Bergen, Norway, he has lived mostly in Tromsø, Norway. At the University of Tromsø, he studied law, social science, and economics and worked for some time in research. In addition, he has been a journalist, a consultant for Norsk Hydro, an administrative leader of the Tromsø branch of the Norwegian Fisheries Association, and chairman of the Tromsø County Council. Mr. Olsen is a member of the Labour Party and led the party's committee on fisheries in 1992.

Sirpa Pietikäinen

Sirpa Pietikäinen is the minister of the environment for the Government of Finland. She was the senior government official involved with the passage of the Finnish Wilderness Reserves Act (1991).

Randall Pitstick

Randall Pitstick received a bachelor of arts degree in psychology in 1989 and a master of arts degree in psychology in 1990, with an emphasis on wilderness and the human-nature relationship, from Sonoma State University in northern California. He is currently a doctoral student, studying the use of wilderness for personal growth at the College of Forestry, Wildlife, and Range Sciences, University of Idaho. Mr. Pitstick is the program manager for Wilderness Discovery, a backpacking program that consists of a series of week-long trips for poverty youth who are enrolled in the U.S. Job Corps.

Ian Player

After serving in the Second World War, Dr. Ian Player began his nature conservation career as a substitute game ranger for the Natal Parks Board, patrolling the shores of Richard's Bay and Lake St. Lucia in Zululand, South Africa. While rising through the ranks to become chief conservator of all parks and wildlife reserves in Zululand, Dr. Player led the Operation Rhino team that saved the white rhino from extinction. He eventually resigned from the Natal Parks Board and founded the Wilderness Leadership School, which pioneered multiracial environmental education in South Africa, and which has taken over 30,000 people of all races into the Zululand wilderness, on foot, to rediscover themselves as they discover nature. In 1974, he

founded the International Wilderness Leadership (WILD) Foundation; and in 1977, he convened the 1st World Wilderness Congress. A deep thinker on many subjects and a committed student and practitioner of Jungian psychology, Dr. Player has received numerous awards and recognition throughout his career, including the Order of the Golden Ark from Prince Bernhard of the Netherlands and the Gold Medal for Conservation from the San Diego Zoological Society.

Peter Prokosch

Peter Prokosch studied biology and oceanography in Bonn and Kiel, Germany. He received his doctoral degree there, studying the ecology of coastal birds in the Wadden Sea (used as a spring staging area for reaching their Arctic breeding grounds). Until 1992, Dr. Prokosch served as the project officer for the World Wide Fund for Nature (WWF, Germany), based in Husum, Schleswig-Holstein, where he worked for the conservation of the Wadden Sea. Since 1989, he has helped develop conservation projects with Russian partners on the Taymyr Peninsula and the Lena Delta. He currently serves as the Arctic Program Coordinator for the WWF (International), based in Oslo, Norway.

Caleb Pungowiyi

Caleb Pungowiyi is president of the Inuit Circumpolar Conference, an international organization that represents approximately 115,000 Inuit living in the Arctic regions of Alaska, Canada, Chukotka, and Greenland. He formerly served as executive director of the Arctic Marine Resources Commission; city manager of the City of Kotzebue; president of Kawerak, Inc.; and vice president of the Bering Straits Native Corporation. He currently serves on the Committee on the Bering Sea Ecosystem, Alaska Conservation Foundation, and Indigenous Peoples Council on Marine Mammals. He formerly served on the boards of directors of the Native American Rights Fund, the Alaska Federation of Natives, and the Alaska Coastal Policy Council, as native advisor to the Marine Mammal Commission, and as chief commissioner for the Bering Straits Regional Commission.

Mamphela Ramphela

Mamphela Ramphela is deputy vice chancellor at the University of Cape Town in South Africa. She is the director of the Equal Opportunities Research Project and responsible for the implementation of the university's equity policies. Dr. Ramphela obtained a medical degree from the University of Natal in 1972 and later obtained diplomas in tropical and public health from the University of Witwatersrand. She earned her doctoral degree in social anthropology from the University of Cape Town in 1991. As a black-

consciousness leader in the 1970s, she was banished to Tzaneen in 1978 where she founded a model community health program, the Ithuseng Community Health Center. Dr. Ramphele has received numerous awards for her research on hostel dwellers and on adolescent violence, including (with Professor Francis Wilson) the 1990 Noma Prize for publishing in Africa. Her most recent book, *A Bed Called Home* (1993), documents the lives of hostel dwellers in Cape Town. Dr. Ramphele holds honorary degrees from Tufts University (1990) and Hunter College (1984), and earned the Medal of Distinction from Barnard College (1991). She resides in Cape Town with her two sons, Hlumelo Biko and Malusi Magele.

Henriette Rasmussen

Henriette Rasmussen is a teacher and journalist, born in 1950 in Qasigiannqut, Greenland. Ms. Rasmussen has been a member of the Greenland Home Rule Parliament since 1984 (elected in 1984, 1987, and 1991) and a minister for social affairs and labor for the Inuit Ataqatigiit Party since April 1991.

Fred Roots

Fred Roots currently serves as science advisor emeritus at the Canadian Department of Environment. He has conducted research in earth and environmental sciences in the Arctic and Antarctic, specifically on the processes of global change and their effects on marine and terrestrial environments, resources, and human activities. Dr. Roots was involved with the preparations for the United Nations Conference on the Human Environment held in Stockholm in 1972 and, subsequently, he was involved in many UNESCO and the Organization for Economic Cooperation and Development (OECD) activities related to science, energy, and the environment. He founded the Canadian Polar Continental Shelf Project and served as its director from 1959 to 1972. From 1979 to 1982, he served as president of the International Commission on Snow and Ice. In addition, Dr. Roots was a founding member of the Arctic Ocean Sciences Board and formerly served as chairman of the UNESCO Man and Biosphere Northern Sciences Network and president of the International Arctic Science Committee.

M. A. Partha Sarathy

M. A. Partha Sarathy is a wildlife conservationist and film maker from a well-known and respected political and business family with deep commitments to culture in India. He has roamed the world on foot, by bicycle, and through other means to discover and celebrate the wonder of nature. After a distinguished academic career as a student of science education in India and America, Mr. Sarathy has devoted his life to conservation and communicating

for sustainable development for over thirty-five years. Mr. Sarathy was twice elected chairman of the World Conservation Union's Commission on Education and Communication, is chairman of the Asian Elephant Specialist Group, chairman of the World Wide Fund for Nature (India), and serves on the board of several national and international conservation organizations. He was recently awarded the United Nations Environment Program's Global 500 Award for his work in environmental protection.

Peter Johan Schei

Peter Johan Schei received an ecology degree from the University of Oslo in 1972 and since 1989 has served as director general of the Directorate for Nature Management in Norway. He also serves as a special advisor on negotiations and follow-up to the minister of environment on the Biodiversity Convention and to the Sustainable Development white paper to the Norwegian Parliament, and is chairman of the United Nations Environment Program's Expert Panel on scientific and technological research in relation to the Biodiversity Convention.

Windsor Shuenyane

Windsor Shuenyane has been the community relations manager for South African Breweries since 1980. He was educated in social work and public relations and has taken various in-house management courses. He held marketing positions with Olivetti, Nestle, and Ussalep from 1965 to 1979 and is a board member for Keep South Africa Beautiful and the National Botanical Institute. He has participated in other international congresses, including Clean World International (Brussels, 1983) and East Africa Environmental Network (Nairobi, 1992). Mr. Shuenyane is married and has four sons.

Evdokija Telekova

Evdokija Telekova is a Nenet from the northern territories of European Russia and represents the Nenet peoples in many international gatherings.

Clem Tillion

Clem Tillion served in the Alaska State Legislature for eighteen years, in the House and then the Senate, stepping out as president of the Senate to become state director of international fisheries. Mr. Tillion served as chairman of the International North Pacific Fisheries Commission and the North Pacific Fisheries Management Council. He has also served on the NACOA, MAFAC the International Fur Seal Commission (as alternate commissioner), and as a U.S. State Department advisor in Japan, Russia, and Korea. Mr Tillion has dedicated his life to the wise management of marine resources

and is renowned for his ability to not allow personalities or special interests to deter him from that endeavor.

Geir Ulfstein

Geir Ulfstein is senior lecturer in law at the Department of Public and International Law. His main research interests lie in international and environmental law, law of the sea, and Arctic law. His latest book (with Robin Churchill) is *Marine Management in Disputed Areas: The Case of the Barents Sea*.

Jens Wahlstedt

Jens Wahlstedt has been secretary general of the World Wide Fund for Nature (WWF, Sweden) for eleven years. He is also a member of the WWF Arctic Committee and the Swedish governmental delegation in the Rovaniemi Process. He has made many visits to the Arctic, including Greenland, Svalbard, and the Taymyr Peninsula in Siberia, as a conservationist, ornithologist, author, and photographer.



5TH WORLD WILDERNESS CONGRESS ORGANIZATIONAL STRUCTURE

5TH WWC ORGANIZATIONAL STRUCTURE

The World Wilderness Congress (WWC) is a project of the International Wilderness Leadership (WILD) Foundation. The 5th WWC was jointly produced by The WILD Foundation and the 5th WWC Governing Board (Norway).

Honorary Chairman—Dr. Thor Heyerdahl, explorer and author
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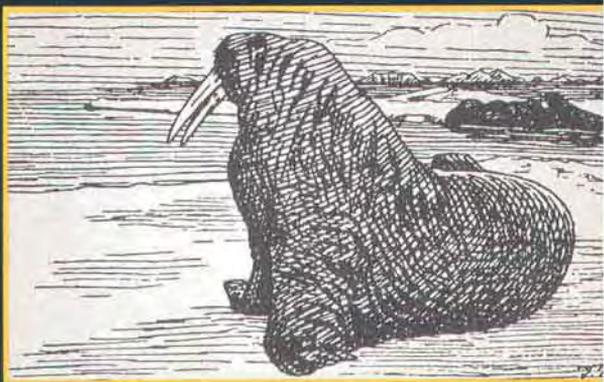
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Civilized humans have too little time to think, especially about the distant past and distant future. Unless we think of what the wilderness meant to our ancestors and what the mega-cities will mean to our descendants, we'll lose perspective and go wild within our own civilization.

—*Thor Heyerdahl, author and explorer*



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