

The 6th World
Wilderness Congress
The Call for a Sustainable Future
BANGALORE, INDIA



Wilderness & Humanity

The Global Issue



EDITED BY
Vance G. Martin
M. A. Partha Sarathy

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Yance G. Martin and
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Golden, Colorado

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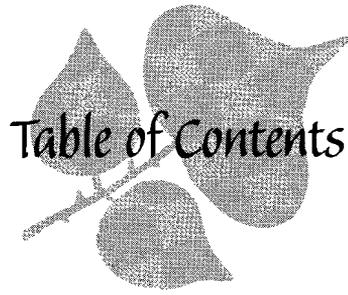
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Preface • vii

M. A. PARTHA SARATHY, Chairman, 6th World Wilderness Congress, and
President, The Wilderness Trust, India

Foreword • ix

Wilderness: A Personal Responsibility

IAN PLAYER

Introduction • xiii

An Attitude for Wilderness

VANCE G. MARTIN, President, The WILD Foundation, USA

Editor's Notes • xxi

Acknowledgments • xxiii

SECTION I. GLOBAL WILDERNESS, WILDLIFE, AND BIODIVERSITY • 1

The Role of Wilderness and Biodiversity in Sustainable Living • 3

KENTON R. MILLER

World Wilderness—Global Assessments and Prospects for the Future • 14

LEE HANNAH

Wild Rivers of the World—A Reconnaissance-Level Survey • 20

MICHAEL McCLOSKEY

Wildlife and Wilderness: The Humane Strategy for Sustainability • 26

PAUL G. IRWIN

SECTION II. THE PEOPLE AT THE HEART OF A HEALTHY PLANET • 31

Gender and Sustainable Communities • 33

DEVAKI JAIN

Wilderness and Dependent Peoples • 36

The Todas of the Nilgiri Hills in Southern India

TARUN CHHABRA

Empowering the Ecologically Handicapped • 40

DHRUBAJYOTI GHOSH

Together, We Survive • 44

KUSUM KARNIK

SECTION III. WILDERNESS AS A PROTECTED AREA • 51

ASIA—India

Wilderness, India, and Developing Nations • 53

HIS EXCELLENCY SHRI. KURSHED ALAM KHAM, THE GOVERNOR OF KARNATAKA, INDIA

Wilderness—A Concept for India? • 55

SHRI. SURESH PRABHU, MINISTER FOR THE ENVIRONMENT AND FORESTS,
GOVERNMENT OF INDIA

Imperatives of the Forestry Sector in India • 57

SHOBHA NATH RAI

Wasting the Wilderness • 60

BITTU SAHGAL

Should India Have Wilderness Legislation? • 71

S. M. SATHEESAN AND SAMAR SINGH

The Gir Lion: Population Dynamics, Predation Pattern, Dispersal, and
Management Issues • 75

H. S. SINGH

The Role of Wilderness in Ecological and Sustainable Food Security in Asia • 83

G. K. VEERESH

ASIA—Malaysia

Protected Area Systems of Malaysia • 90

JASMI BIN ABDUL

ASIA—Nepal

Wildlands and Their Status in Protected Area Management in Nepal • 99

RABI BAHADUR BISTA

ASIA—Sri Lanka

Origins, Evolution, and Present Status of the Protected Areas of Sri Lanka • 115

LYN DE ALWIS

AFRICA—Kenya

The Evolving Role of Conservation Areas in Africa • 122

WALTER J. LUSIGI

AFRICA—Namibia

Current and Future Prospects for Wilderness in Namibia • 128

TRYGVE G. COOPER

AFRICA—South Africa

An Update of the Status and Prospects of Wilderness Areas in South Africa • 134

WILLIAM R. BAINBRIDGE

EUROPE—Italy

Wilderness between Towns and Cities—The Wilderness Concept and Its
Philosophy in Italy: The History and the Successes of the Idea as a
Conservation Principle • 144

FRANCO ZUNINO

SOUTH PACIFIC—New Zealand

Wilderness in New Zealand: Status, Prospects, and Recommendations • 148

MURRAY C. REEDY

NORTH AMERICA—United States

Protecting Our Natural Legacy: Universal Threats to Wilderness • 151

SANDRA KEY

The U.S. National Wilderness Preservation System • 154

GERALD L. STOKES

Alaska Wilderness: A Model with Worldwide Application • 157

ROBERT D. BARBEE

The Arctic National Wildlife Refuge: The Evolving Meaning
of a Symbolic Landscape • 160

ROGER W. KAYE AND JAMES W. KURTH

SECTION IV. WILDERNESS AND ECOLOGICAL RESTORATION • 167

Participatory Resource Monitoring by Soliga Tribal People at
Biligiri Rangaswamy Temple Wildlife Sanctuary • 169

R. SIDDAPPA SETTY, K. S. MURALI, AND H. SUDARSHAN

Human, Animal, and Wildlife Interactions:

Problems and Solutions for the Nilgiris, South India • 172

JOHN D. GRIFFITH AND MICHAEL W. FOX

Wilderness Restoration: A National and Global Priority for the Next Century • 183

ALAN WATSON FEATHERSTONE

The Earth Restoration Corps • 188

VANCE HARTKE

SECTION V. WATER WILDERNESS • 191

The High Seas: Is There Room for Wilderness? • 193

MAXINE MCCLOSKEY

The Okavango Delta: Wetland on the Edge • 198

KAREN ROSS

The Living Lakes Project • 207

ULF DOERNER

**SECTION VI. CORPORATE ENVIRONMENTAL RESPONSIBILITY:
CASE STUDIES WITH QUESTIONS AND ANSWERS • 213**

Case Studies on Ecorestoration of Hydel Catchment Areas and Environment
Awareness Programs Through Corporate Initiatives • 215

ERACH BHARUCHA

Corporate Environmental Responsibility: A Case Study on
Biodiversity Conservation in the High Range • 224

T. DAMU

Shongweni: Protecting Wildlands in Peri-Urban Settings in South Africa • 229

ROLAND GOETZ

Corporations Today: Responsibilities to Ensure There Will Be a Tomorrow • 234

HERBERT F. KROLL

Industrial Ecology and Living Machines • 239

MICHAEL SHAW

Exploring Sustainability in Cocoa Production: It's More Than

Just about Chocolate! • 246

SASHA SILVER

SECTION VII. THE VISION: WILDERNESS AND PERSONAL GROWTH • 257

Wilderness Experience for Spiritual and Personal Growth in Siam • 259

PRACHA HUTANUWATR

Imbwe: The Wilderness Seed in South Africa • 264

ANDREW MUIR

Wilderness Vision Quest Clients, Motivations, and Reported Benefits from
an Urban Based Program, 1988–1997 • 267

MARILYN FOSTER RILEY AND JOHN C. HENDEE

SECTION VIII. THE PRACTICE AND PHILOSOPHY OF WILDERNESS • 275

The Questionable Ethics of Treating Wild Animals

as “Resources” for Human Use • 277

RANJIT KONKAR

Wilderness—An Indian Spiritual View • 285

SWAMIJI VIBUDHESHA TEERTHA OF SRI ADMAR MUTT

The Soul of the Wilderness: Who Needs Philosophy? • 286

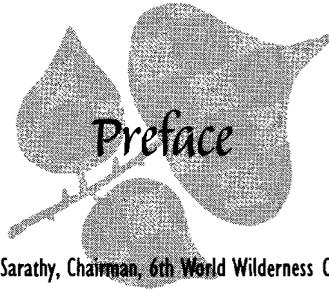
DAVID ROTHENBERG

SECTION IX. APPENDICES AND INDEX • 293

Appendix 1: Resolutions of the 6th World Wilderness Congress • 295

Appendix 2: Presenters at the 6th World Wilderness Congress • 312

Index • 315



M. A. Partha Sarathy, Chairman, 6th World Wilderness Congress, and
President, The Wilderness Trust, India

The 6th World Wilderness Congress (WWC) in Bangalore, India, the city of my birth, renowned as the Garden City of India, was indeed a milestone in my life.

The galaxy of distinguished participants—nearly 1,000 of them from all parts of the world—were, of course, joined by the founder of the WWC, Ian Player, even as a caparisoned elephant greeted all of them, the governor of our state, the minister for the environment of our country, and many special guests, amidst traditional musicians and dancers. It was a great gathering of young and old, men and women, celebrities and noncelebrities. They all drank from the fountain of shared knowledge, and when, on the last day, I rose to reluctantly bring the curtain down on the 6th WWC and bid a “temporary” good bye to so many kindred spirits, I could sense that everyone who was there would go home with rewarding memories and an action agenda.

For my colleague Vance Martin and myself, the road to this congress was indeed long and arduous. We walked through great forests of uncertainty, difficult valleys of diffidence, and dark clouds of imminent disaster. But these were soon followed by welcome patches of sunny hope, inviting us to go forward, and we did, all magically ending when a grand confluence of minds and spirits came together on that sunny morning—in a spirit of concern and affection for our planet and its inhabitants.

The program of this congress was perhaps among the most ambitious yet, encompassing more than any of the congresses held before. It was reflected in the theme, “The Call for a Sustainable Future”—a multifaceted call. It was variously a call in distress, a call in celebration, a call of concern, a call for enlightened guidance. Indeed, it was not just a call, it was a chorus of calls, a chorus of human voices from across the planet, pleading and invoking the coming together of all human beings on this planet to ensure that the planet lives, that it lives in comfort, that it lives productively, that it lives in continuing benevolence; to ensure that the spirit in which the planet has sustained all life on earth, is not extinguished by the flame of heartless or reckless use.

Well-attended plenaries and working sessions encompassed a wide variety of concerns: the state of global wilderness; community biodiversity; wilderness as a protected area; social and ecological values of wilderness—opportunities and challenges; the future of the tiger, and of the elephant; sustainable cities; the role of education and media; and the use of wilderness for personal growth. Some sessions were under big spreading trees in the gardens of the gracious Hotel Ashok, benefiting from the cool weather of Bangalore.

Earlier, many minds from around the world had come together to help us produce the program for the 6th WWC. It was crafted over many months—drafted, redrafted, discussed and rediscussed—and each plenary and session fine-tuned like a musical instrument and made part of an orchestra, toward the theme “The Call for a Sustainable Future.”

The participants in the WWC did not gather to deplore, moan, and groan about the state of our planet, as often happens at international conferences on the global environment. Instead, they came radiating confidence in our future, while seeking to better understand the facts of life on earth, the human-inflicted

wounds on our planet, the healing touches that we can give, and the scientific and spiritual balms we can bring forth to heal the wounds of the past. And also to create a new approach to life on this planet, which energizes and recharges the batteries of our own capabilities, which we have often ignored or forgotten; put this energy to nondestructive use, to the gift of scientific knowledge that we have acquired; and reinvoke the extraordinary spiritual heritage that all of us have within us. At the core of it all, of course, is the critical role of wild nature on this planet.

As chairman of this 6th WWC, I had some ambitions, as I am sure many who had participated in earlier congresses had, about how they would like this congress to emerge after all the deliberations. I viewed the congress as not a place where people talk to each other about what all of them already know, and satisfy themselves by having done so. I saw it as one that provoked thinking; one that had room for vigorous interaction among the participants; one that did not shy away from dialogue and debate, bringing forth different points of view; one that brought together the perceptions of the intellectuals of the East to the West, of the West to the East, of the North to the South, and of the South to the North. And when this happened, I felt grateful and fulfilled.

Every participant of the congress felt we owed this to future generations, to use this extraordinary opportunity at the 6th WWC to have brought our minds and hearts together, with honesty, sincerity, and a sense of cooperative purpose, so that when we left and went back home, we shall have contributed positive recommendations, not only in the form of resolutions, but also in the form of opportunities for action within our own states and our own countries, and among our own governments, to act toward a better, more sustainable future for all humankind.

I had another ambition about this congress—the result of my having descended from a family of spiritual leaders and having had the privilege of traveling to the four corners of this planet often, with the sky as my roof and the open road as my home, which have given me a sense of the spirit of this planet. As a result, the spiritual dimension in our efforts to understand nature, to relate to acts of conservation with respect, affection, and concern, was important to me, apart from the science and technology attached to all acts of conservation toward sustainable development. I was therefore thrilled to see that this congress addressed the spiritual dimension with the same vigor as they did the scientific and other dimensions.

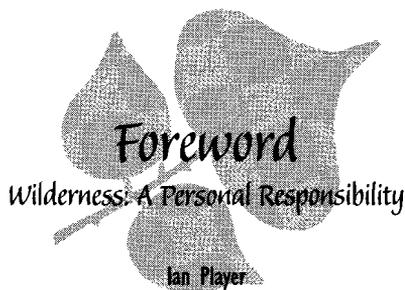
And then there was the grand musical evening—a confluence of East and West—with a vibrant Indian singer filling the great hall with her scintillating voice, as she blended her melody with a swinging jazz performer from the West on the clarinet.

I recall that as I concluded my welcome address on that first day with a traditional statement in Sanskrit,

*Sarve Jano Sukhino Bhavanthu;
Samastha Sanmangalaani Bhavanthu
“Let all mankind have peace and fulfillment;
And let there be good tidings for all”*

tears came to my eyes—tears of gratitude for all those who had come to Bangalore, to put their minds and hearts together to make a resounding, meaningful response to the call for a sustainable future for all life on our planet.

When the congress concluded, resolutions complete and action agenda confirmed, we heralded with great enthusiasm, the forthcoming 7th WWC, which will take this important work forward.



Foreword
Wilderness: A Personal Responsibility
Ian Player

The Roman poet Virgil said, “Blessed are those who learnt to know the Gods of the wilds.” But the gods have made the wilderness congresses a most difficult happening. Yet each congress has had a life of its own and been extraordinarily worthwhile. Deep personal friendships have grown over two decades, and this in turn has furthered the concept of international wilderness. We have seen it spread to other countries and become entrenched in law. It’s always been the individual who has made the difference.

It was in South Africa that Mahatma Gandhi went through his baptism of fire—first as a stretcher-bearer in the Anglo Boer War and then in the political arena with his enduring philosophy of nonviolence and self-reliance. I doubt whether the modern world has witnessed a better example of personal responsibility and the power of the individual. Here was a man who lived a truth so powerful that it defeated the might of the British Empire. There is no better example for us in the wilderness movement as we face the onslaught of what Arnold Toynbee called “the acceleration in the development of the technosphere.” Long ago Mahatma Gandhi foresaw the dangers.

In Pietermaritzburg, South Africa, the citizens are proud to point out the statue of Gandhi and claim him as one of their own. Gandhi’s presence in South Africa put a human stamp on the ancient continent of Gondwanaland, when India and Africa were once one.

I would like to reflect on the origins of the World Wilderness Congress (WWC). In 1976 my Zulu friend Magqubu Ntombela and I were leading a small group of six people on foot in the wilderness area of Mfolozi Game Reserve in Zululand. We camped the night on the banks of the Black Mfolozi River, and at a moment in the lull of conversation, Magqubu made his pronouncement to me that the time had come to hold a big gathering of all the people who had walked in the wilderness. Magqubu could neither speak English nor read or write, but he was one of the wisest men I have ever known. Together, we took more than 3,000 people into the wilderness on foot.

When all the others had gone to bed, Magqubu and I talked late into the night. Great activity surrounded us with lions roaring to each other downstream, the noise echoing and reverberating against the rocky cliffs. Hyenas whooped from the nearby hill as they padded toward the sound of the lions, in expectation of a kill. White rhinos shuffled by on their way to water, and we could hear the calves as they tried to suckle. Night jays and owls swooped around us, frogs croaked in unison, buffalo grazed on the opposite bank, and we heard the unmistakable bellow of a mating crocodile.

Wild Africa spoke to us out of the darkness.

I awoke before dawn pondering Magqubu’s suggestion. Then, I asked the universe to give me a sign. The first shafts of sunlight spread across the landscape, and for a split second illuminating the rocks on top of a nearby hill called Amatshemphlope in Zulu—white rocks. I had known this hill for twenty-four years, but never understood why it was given this name. Suddenly, and for the briefest moment, the rocks blazed white—then in a flash went back to their dun coloring.

Some Zulu had seen this and given the hill its name. Here was the light. I took it as a positive sign and in October 1977, in the midst of the incredibly politically turbulent South Africa, and against great odds of no finances, political hostility, and international isolation—in a racially divided land—the 1st WWC took place. Need I add that Magqubu was a speaker, the first black game scout in the history of my country to appear on a platform with white political leaders.

The 1st WWC brought delegates from twenty-seven countries. It presented the largest exhibition of conservation art ever held in South Africa, which was organized by Nora Kreher who is here today. There were programs for integrating culture and races around the world in nature conservation. It introduced the wilderness concept as an international issue of importance, as well as incorporating economics and banking as major issues on the conservation agenda. The presence and presentation by Edmund de Rothschild, the banker, played a major role. As a result of a wilderness trek in Zululand, he has remained committed to the wilderness cause, and again is an example of the power of the individual and personal responsibility. It was a spark that has continued.

Through Michael Sweatman, Edmund de Rothschild, and others, the 1987 WWC proposed the establishment of a World Conservation Bank, which eventually led to the 1.1 billion U.S. dollar Global Environment Fund of the World Bank.

In 1993 the 5th World Wilderness Congress was held in Tromsø, Norway. Michael McCloskey presented the first inventory of wild rivers of the North. It was at this congress that the concept of sustainable living as an evolution of sustainable development was introduced.

The fact that the congress took place in Norway strengthened the wilderness concept in the circum-polar development debate, while recognizing sustainable use by indigenous cultures. These are brief glimpses into what were major undertakings, against what at times seemed insuperable difficulties.

It has been a long journey from that fateful day in Mfolozi Game Reserve in 1976, when Magqubu and I discussed the Great Gathering. The shaft of sunlight on the rocks was a confirmation that the trek should begin. From Africa to Australia, Scotland to America, Norway and now India, we have experienced the shaft of light that has helped to open our collective eyes to the importance of wilderness.

Now, here we are in India for the first WWC held in the East. Recognition again for the power of the individual must be given to Partha Sarathay who with Vance Martin, Krishnan Kurty, and their team ensured that we are here today.

This ancient mother continent with its people, religions, and history will have a profound effect on all of us who come from the other side of the world and for the future of wilderness in the world. C. G. Jung, as a critic of many aspects of modern Western life, said that the wisdom and mysticism of the East have very much to say to the Western world.

Many of us have come to India on a pilgrimage to learn, because we are only too painfully aware that the modern European spirit treats the earth as an object of possession and manipulates it accordingly. As Alan Birru says, most people in our advanced industrial societies have lost their cosmos, that is, their image of order, of a meaningful universe and a friendly world.

Wilderness as a sacred place is well known to almost every culture, and I don't know of a place where it is not threatened. In the small wilderness area in Zululand, where the origins of the congress began, the sound of airplanes, trucks, and distant railway trains intrude upon the natural sounds. When one walks, the unconscious link with the landscape and the soul is broken, and it becomes a moment in between wilderness experience. I take my hat off to Gordon Hempton in the United States who is now monitoring the extraneous sounds in national parks and wilderness. Hempton is right that natural soundscapes should be conserved like other endangered species.

The truth of the matter is that since the start of the Industrial Revolution, humanity, particularly in the Western world, has knelt increasingly at the altar of Mammon. The consumer infection has now spread throughout the world, and wilderness everywhere has become threatened.

As everyone who has been into the wilderness knows, it holds the key to our survival as a species. Jesus Christ, Buddha, Mohamed, and all the other prophets, who went out into the desert or the mountains, returned with a vision of God. Every day, everywhere in the world where there is a wild area, men and women go out to seek their own vision and return inspired and humbled by the experience of isolation. In the past it was Thoreau with his undeniable statement that in wild lands lay the preservation of mankind.

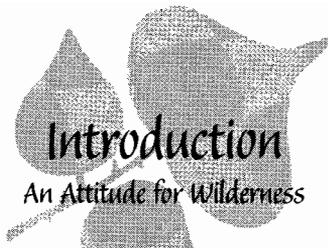
The new millennium will undoubtedly bring its own global spiritual leader, who perhaps this very day is in meditation and contemplation in some wild place. Hopefully, the gods will send a woman this time.

Before he died in 1996, Laurens van der Post spoke to a wilderness gathering, and he said, "We have a far greater vision of our future than is now being politically sought—we don't want old patterns—we want a larger vision." He said whenever people were in trouble, they went back to the wilderness to regain their courage and inspiration. It is no wonder that the Tree Hugging people of India fight so valiantly for their cause. We in the international wilderness movement have to rededicate ourselves to the conservation of the wilderness and do our best to ensure that the leaders of our different societies travel into the wilderness and experience themselves, thus becoming more understanding of the interdependence of humanity and the earth.

The theme for this conference is "The Call for a Sustainable Future." Many distinguished people will present papers during the conference. They come from all parts of the globe, dedicated and personally responsible men and women gathered on a continent where almost everything known to humanity has been experienced. They will present papers on science, culture, philosophy, religion, and art. There will be music and dance, poetry and song. We are indeed privileged, and we must act on behalf of wilderness as a result.

After forty-six long, practical years in the service of wildlife conservation and wilderness, I believe that a "sustainable future" must embrace the sacredness of wild places and the spiritual value to humanity and the recognition that all life beyond our own has the right to exist.

India can show us a way.



Introduction

An Attitude for Wilderness

Vance G. Martin, President,
The WILD Foundation, USA

Twenty-five years ago I traveled up, down and across South Asia. With far more enthusiasm and curiosity than financial resources, my means of travel were innovative and opportunistic: from my two feet, to third class trains, to four-wheeled bullock carts—with the occasional lorry that crept up the mountain passes only to careen thunderously down the other side. I spent a lot of time on my feet, meeting people, sleeping rough, getting sick, and wondering how Life kept all its diversity together.

The culture of India especially amazed me: a sensory collage of colors, sounds, human predicaments, environmental challenges and cultural triumph over 11 thousand years old. I recently found a letter I wrote to my parents in 1972, from a beach in southern India (Goa, where else?) In it I extolled my fascination with the depth and diversity of Mother India. But even then my inherent sense of ecological proportion led me to wonder how India, with some 600 million people, could possibly last much longer.

Since those years of early rambling I have returned to the region many times, almost always on the business of nature conservation. Finances arguably improved, I more often now fly or have a driver. From the creative compactness of Old Delhi to the dense hustle of Bombay, from the stark but beautiful plateaus and highlands of the upper Himalaya to the tigers, tribal people and rich biological treasures of the Nilgiri Hills, India's diversity continues to embrace, confuse and inspire me.

These personal peregrinations and working assignments were an early foundation of the 6th World Wilderness Congress, later built upon in cooperation with the life-long professional experience and commitment of friend and colleague M. A. Partha Sarathy and his World Wilderness Trust. This has been the tradition in the WWC—each Congress has been established through the synergy of experiences, perhaps unique, held by most of its central people—experience in the wilderness, in policy and politics, in research and business, in project implementation, and in diverse cultures and economies:

- 1st WWC—Many decades of African wilderness protection and indigenous history, especially the Umfolozi wilderness experience by game ranger and statesman Ian Player with Zulu Game Scout Magqubu Ntombela, led to the 1st WWC in Johannesburg in 1977;
- 2nd WWC—Many years spent in, and fighting for, the Cape York wilderness of Northeast Australia by Wally O'Grady and Percy Tresize (practical farmers and conservation activists) and their aboriginal companions, inspired and informed by the brooding silence of the open plateaus, the dense diversity of the lowland tropical rainforest, and the stunning but hair-raising presence found within the miles of rock art galleries in the Cape York escarpment—led to the 2nd WWC in Cairns, Queensland in 1980;
- 3rd WWC—A lifetime of immersion and identification with the Gaelic culture and Scottish wildlands by veteran forester Findlay MacRae, combined with the commitment to cross-cultural

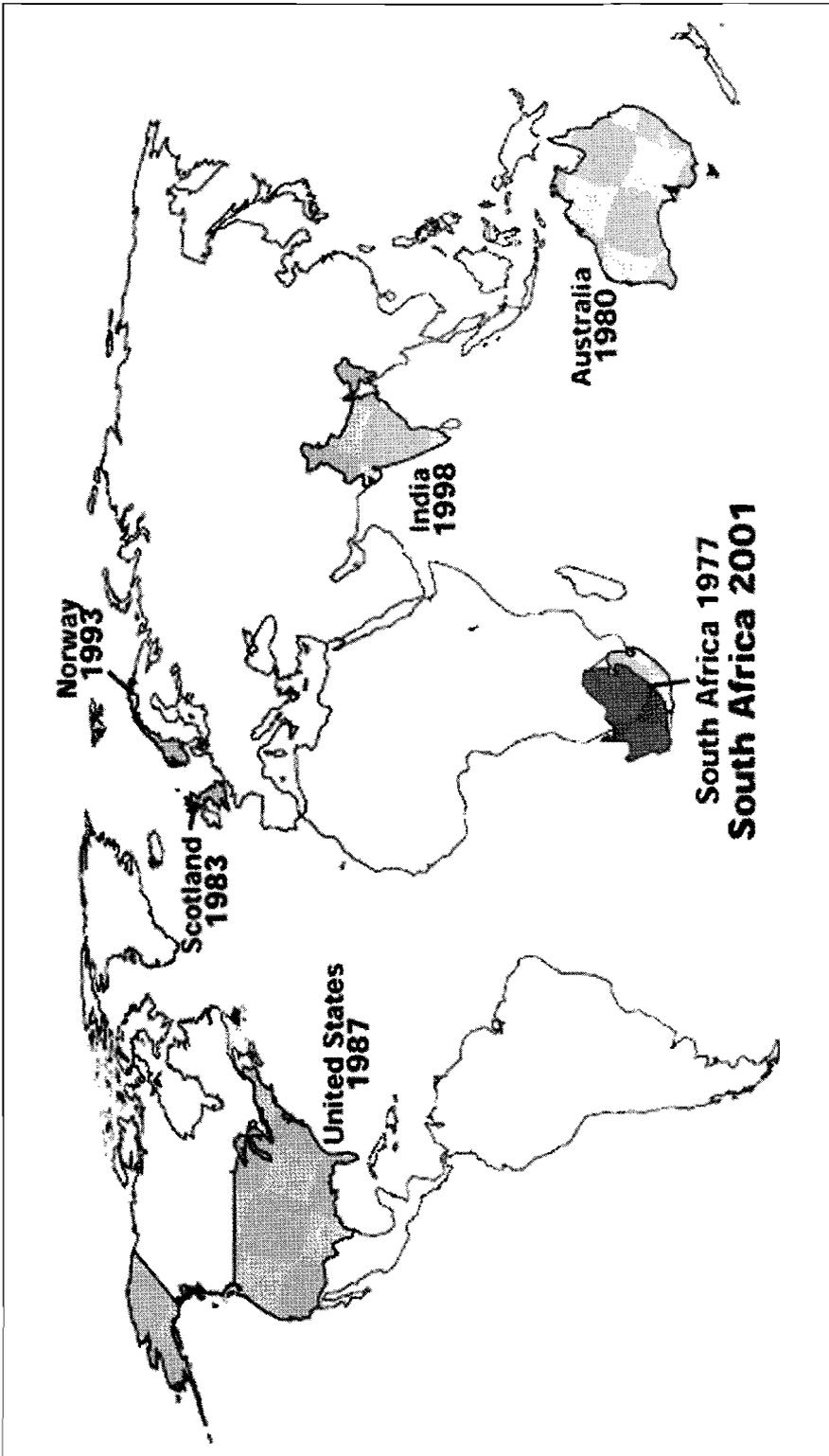


FIGURE 1—The World Wilderness Congress has convened in six different countries over the past 20 years.

cooperation practiced by the Findhorn Foundation in northern Scotland, convened the 3rd WWC in 1983;

- 4th WWC—The many years and multiple generations of experience, research and activism for the American wilderness by Dr. John Hendee, U.S. Forest Service, the Sierra Club and many others, convened the 4th Congress in Colorado in 1987, with participation by 60 diverse nations, including a delegation of 25 elders of First Peoples;
- 5th WWC—The singular commitment to Arctic wilderness by explorer and ecotourism pioneer Robin Buzza, the sustainability and use of wildland resources by generations of indigenous people in the far North, and the historical and global perspective of the link between wilderness and human society espoused by Nobel Laureate Thor Heyerdahl, framed the 5th Congress in the far north of Norway in 1993.
- 6th WWC—Partha Sarathy, life-long international conservation educator, industrialist and filmmaker, collaborated with a host of Indian activists working for the betterment of poor, rural villagers as well as improved national policy, to convene the 6th Congress in Bangalore, South India, in 1998.

The philosophical and practical foundation of the WWC is therefore reasonably simple—a personal experience of wilderness, leading to an irresistible commitment to educate the public, inform policy makers, and act in practical ways to help protect and sustain wilderness and wildland values for all peoples. Such a straightforward purpose, however, is more than offset by the circuitous and challenging route of planning and implementing the collaborative WWC process.

As always in our field, finance has been a significant challenge. We have worked this to an advantage. In order that each Congress effectively addresses important issues of global and regional concern, each Congress starts with a request from a concerned, regional NGO and a “zero budget.” Its mission, objectives and plan are then built in a manner relevant and applicable to current regional and global concerns, and their wider social, political, economic and cultural context. If the agenda is accurate, useful and inclusive, the funds are raised accordingly ... and with a great deal of effort. Not a small task.

Inevitably, it always comes down to key individuals whose commitment is the vital spark that makes each Congress happen. The WWC is many things, but one thing it most certainly is not is an institutional process. It's about individuals and organizations acting alone or in concert, in cooperation to the extent possible, with an overriding concern for the well-being of nature and humanity, an eye for the future, and a respect for the mystery and the practical reality of which humans are but a part.

In many ways, each WWC serves as a benchmark against which we can measure our collective progress (or lack thereof) towards an important goal—defining a human civilization that understands natural proportion, lives sustainably, and respects life. In addition to expanding the contextual framework in which the role of wilderness can be both appreciated and quantified, the Congress (the individuals and organizations which participate) has achieved many practical results: declaration of additional protected wildland areas; inventory of global wilderness areas (1987) and wild rivers of the world (1998); launching the concept that led to the Global Environmental Facility of the World Bank (1987); recognition of wilderness within the IUCN's Framework of Protected Areas; and much more.

Another essential philosophical base of the WWC has been our insistence in over 25 years of meetings, policy debates, and formal and informal sessions that matters of spirit or culture—call it what you will—are equally important in natural resource issues to matters of science, politics, economics and education. Non-material, inherent values are essential and powerful, and need to be recognized, respected and included.

As a great deal of this wisdom and perception resides within the tradition of indigenous people who are still residing in and/or dependent upon wildland areas for practical and cultural survival, the WWC was one of the first international environmental forums to integrate and present the needs and views of first peoples—and we continue to do so.

A further ongoing aspect of the WWC has been to clarify how wilderness is defined in law, and therefore protected and managed across the diversity of cultures and nations. The 6th WWC continued this global overview. A summary at this turn of the millennium may be helpful.

GLOBAL WILDERNESS LAW AND RECOGNITION

Under the IUCN's Framework for Protected Areas, wilderness resides as a Category 1 (a)—out of 5 categories—with Strict Scientific Reserves as Category 1 (b). The definition, honed through the input of many sessions, organizations and individuals in the WWC, and ultimately through the hard work of the IUCN's World Commission on Protected Areas, is:

“Large areas of unmodified or slightly modified land and/or sea, retaining its natural character and influence, which is protected and managed so as to preserve its natural condition.”

The simplified management objectives provide further clarification:

- To ensure enjoyment by future generations of areas largely undisturbed by human action;
- Maintain essential natural attributes and qualities over long term;
- Provide appropriate public access to best serve the physical and spiritual well-being of visitors while maintaining wilderness;
- Enable indigenous communities to continue living at low density, and in balance with available resources to maintain their lifestyle.

Once these helpful and necessary guidelines were reestablished within the IUCN's Framework in 1992, the WWC (Martin, 1997) went further to clarify types of wilderness recognition and protection, by creating criteria for three classes (see Fig. 2).

- Class 1—Statutory—areas protected by the highest law of the land and/or jurisdiction in which the areas reside. Such protection can only be revoked through a legislative process. This occurs in the United States, (The Wilderness Act 1964,) Australia, (legislation in numerous states,) South Africa, (National Forest Act, amended 1971,) Canada, (National Parks Act, revised 1988,) Finland, (Wilderness Act, 1991,) the Flathead Indian Reservation, Montana, (Mission Mountains, Tribal Wilderness Ordinance, 1982,) Sri Lanka, (National Heritage and Wilderness Act, 1987).

The legislation virtually always mandates a certain type of management by relevant authorities in order to sustain wilderness values, such as no mechanized transport, no permanent human habitation, etc.

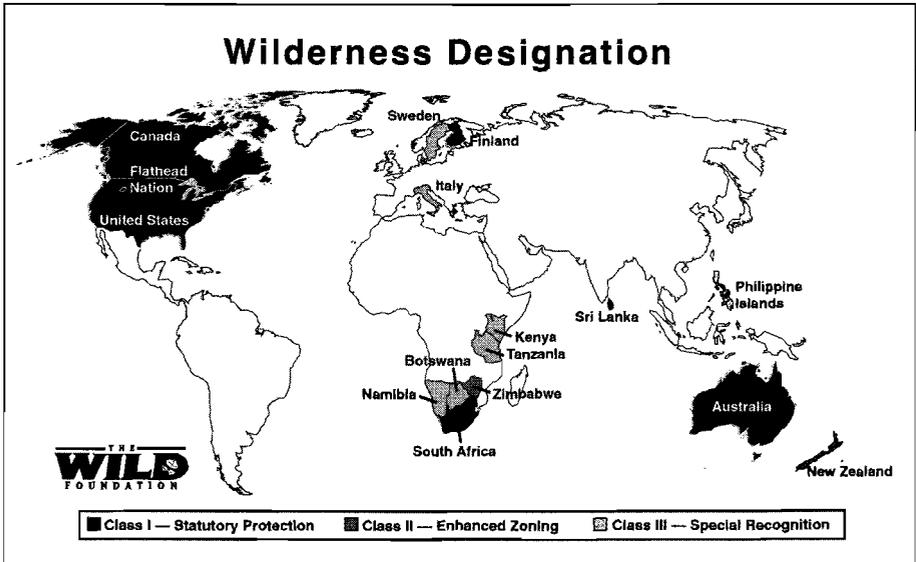


FIGURE 2—The classes of Wilderness Designation around the globe.

- Class 2—Enhanced Zoning—significant protection though not necessarily legislated. New Zealand, (mandated through actions of the Minister of Environment,) Zimbabwe, (Tribal Authority Declaration in the Mavuradonha Wilderness Area,) Italy, (various Municipal Acts, 1990's,):

Generally implicit (though not required) in these areas is a strong emphasis on management that sustains wilderness values.

- Class-3 Wilderness Recognition—recognition by administrative designation, (usually by a departmental managing authority or official). Namibia, (Waterberg Wilderness Area,) the Philippines, (Palanan Wilderness Area,) Suriname Wilderness Nature Reserve, and more.

There are other areas and countries in the world in which the word “wilderness” is used generically as the name of a natural area, but very few of these actually have any management guidelines to maintain wilderness values.

Positive benchmarks such as further protected wildlands, better policy and legislation, expanded education, and so on, are critically necessary as we move into the 21st century. Impacts on wild nature from the ballooning population in less developed countries are ever increasing, and the juggernaut of unrestrained consumerism in America, Europe and Japan daily takes a more insidious toll on wildlands worldwide.

While wildlands conservation and sustainability have some success stories that must be recounted, evaluated and steadily improved upon, the fact remains that they still amount to little more than triage in the face of unrelenting ecological trauma. Voices from every quarter offer solutions, criticisms, worries and complaints: “more scientific data;” “better economic valuation;” “improved policy and monitoring;” and more. All of these ideas and issues are important, but are still unmistakably part of the emergency room jargon,

and in themselves only provide partial solutions, and do not appear to create health. We need to get out of the emergency room and into the healing process. A type of “core transformation” is needed.

Any true change must start at home, with the individual. Scientists, policy makers and others are rightly concerned about complex and sustainable solutions to the difficult challenges in front of us. But let’s not forget the power of personal attitude. And, since personal attitude is about the only thing over which we actually have complete control, arguably it could be regarded one of our most dependable and effective tools in anything we do. What elements comprise this “tool”? Respect is required; cooperation is essential; and the need for change is a given.

The simple, irrefutable truth is that we are a part of nature, not apart from nature, and the systemic solutions society requires reside already in the wildness, wind, water and the wonder all around us. We simply need to regard nature differently—with respect and humility—and we need to plan our life in proportion to that which we draw from the natural world.

Perhaps I stumble with my words. It often takes a woman to understand values and actions such as those I suggest, and Terry Tempest Williams offers us a straight-to-the-issue, gentle yet powerfully penetrating truth when she describes her experience in Utah’s desert wilderness in her remarkable book, *Refuge*.

The understanding that I could die on the salt flats is no great epiphany. I could die anywhere. It’s just that in the forsaken corners of Great Salt Lake there is no illusion of being safe. You stand in the throbbing silence of the Great Basin, exposed and alone. On these occasions, I keep tight reins on my imagination. The pearl-handled pistol I carry in my car lends me no protection. Only the land’s mercy and a calm mind can save my soul. And it is here I find grace.

It’s strange how deserts turn us into believers. I believe in walking in a landscape of mirages, because you learn humility. I believe in living in a land of little water because life is drawn together. And I believe in the gathering of bones as a testament to spirits that have moved on.

If the desert is holy, it is because it is a forgotten place that allows us to remember the sacred. Perhaps that is why every pilgrimage to the desert is a pilgrimage to the self. There is no place to hide, and so we are found.

In the severity of a salt desert, I am brought down to my knees by its beauty. My imagination is fired. My heart opens and my skin burns in the passion of these moments. I will have no other gods before me.

After over 25 years of planning and acting for wilderness and people worldwide, the WWC now enters the 21st century. During that 25 years, despite the practical accomplishments of the Congress and many other specific environmental initiatives around the world, the issues before us mount in number and complexity. For example, in that letter to my parents 28 years ago I wondered how India could survive with 600 million people—she now has 1 billion. Despite the endemic poverty, paradoxically there is less starvation now than before, (the desired result of the “green” revolution that brought other woes in its wake) and India proudly boasts of having the world’s largest middle class. And we all know that this middle class understandably wants what the western middle class already has.

During the same 25 years there have been many other environmental changes ... the “signs” are not lacking: glaciers throughout the world are in accelerated retreat at a rate far greater than ever witnessed;

the Arctic ice cap has dissipated almost 9% during this time; average global temperature has increased approximately 1.5 degrees C; the final vestiges of tropical wilderness are being massively burned in Indonesia and cleared for farming in the Amazon. Where once wilderness surrounded humanity, humanity now surrounds wilderness... and is fast closing in.

We have our work cut out for us! Sustainability is our goal, and it is achievable. Changes are needed: cooperation is essential: respect is required. Simple but practical changes in personal attitude, liberally applied with faith and persistence to our political, technical and economic strategies, can and do make a critical difference. They help us move toward a society that we need, one that speaks with one voice, and acts with a singular commitment, for the well-being of wilderness, wildlife and people.



The papers in this volume are those presented in the plenary sessions of the 6th World Wilderness Congress that convened in Bangalore, India, 24-29 October 1998. A very few presentations to the delegates are omitted from these proceedings due to incomplete submissions by the author(s). As customary with the proceedings of every WWC, each paper has been edited for accessibility and ease of reading, including some consistency of style. References have, for the most part, been omitted. Should the reader wish to have the full paper with references (if they were originally included), or for any other questions, please enquire directly to the author(s), contact information for whom is in the appendices.

This edition is the US-based publication, therefore American style English is used. Another edition is available in India.

Numerous technical symposia also convened in working session at the 6th WWC. The full technical proceedings of one of the primary such sessions, The Personal, Societal, and Ecological Values of Wilderness, is available:

- Watson, Alan, Aplet, Greg and Hendee, John C. comps. 1998. Personal, Societal and Ecological Values of Wilderness: Sixth World Wilderness congress Proceedings on Research Management, and allocation. *Vol. I. Proc. RMRS-P-14. Ogden, Ut. US Dept. of Ag. Forest Service, Rocky Mt. Research Station.*
- Watson, Alan, Aplet, Greg and Hendee, John C. comps. 2000. Personal, Societal and Ecological Values of Wilderness: 6th World Wilderness Congress Proceedings on Research, Management, and Allocation. *Vol. II. Proc. RMRS-P-14. Ogden, Ut. US Dept. of Ag. Forest Service, Rocky Mt. Research Station.*

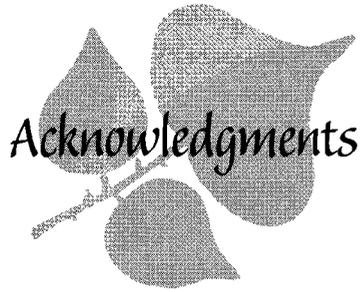
The proceedings of previous World Wilderness Congress are:

- Player, Ian, ed., 1978, *Voices of the Wilderness, proceedings, 1st World Wilderness Congress.* Capetown, SA, Jonathan Ball.
- Martin, Vance ed. 1981. *Wilderness; proceedings, 2nd World Wilderness Congress.* Findhorn, Scotland, Findhorn Press
- Martin, Vance and Inglis, Mary, eds. 1984 *Wilderness – The Way Ahead; proceedings, 3rd World Wilderness Congress.* Middleton, Wi., Lorian Press
- Martin, Vance, ed. 1988. *For the Conservation of Earth; proceedings, 4th World Wilderness Congress.* Golden, Co., Fulcrum Inc
- Martin, Vance, and Tyler, Nicholas, eds. 1994. *Arctic Wilderness, proceedings, 5th World Wilderness Congress.* Golden, Co., Fulcrum Inc.

A formal review of the WWC was published in the *International Journal of Wilderness*:

- Martin, Vance, 2001; *The World Wilderness Congress. Int'l Journal of Wilderness.* 6 (1), April

For these proceedings and more information on the World Wilderness Congress, visit www.wild.org.



Acknowledgments

The World Wilderness Congress, though a project of The WILD Foundation, is in fact an international, collaborative process. The 6th World Wilderness Congress, like its five predecessors since 1977, was the result of the hard work, financial support and commitment of many people, organizations, foundations, and agencies. For those whose name may be omitted, we thank you too and ask for your forbearance.

Essential financial and in-kind support came from The Thoresen Foundation (USA), The Ohrstrom Foundation (USA), The WILD Foundation (USA), The World Wilderness Trust (India), The Wilderness Foundation (South Africa), The Wilderness Leadership School (South Africa), National Outdoor Leadership School (USA), Agromore (Pvt) Ltd, the Government of Karnataka, Armand G. Erpf Fund.

There were a few special people, wilderness “angels” so to speak, who deserve special mention: Michael Thoresen, Magalen Bryant, Brock Davenport, Virginia Coyle, Robert and Charlotte Baron, Mrs M.A. Vedavali, Mr/s M.A. Srinivasen, Verne and Jean Maclaren, Harry Tennison....and many others.

Those on the 6th WWC Organizing Committee were stalwarts: M. A. Partha Sarathy (Chairman), D. Gosh, S.P. Godrej, Vance G. Martin, M.K. Prasad, Samar Singh, Raman Sukumar, Dilnavaz Variava, M.D Narayan, and Ian Player (ex officio).

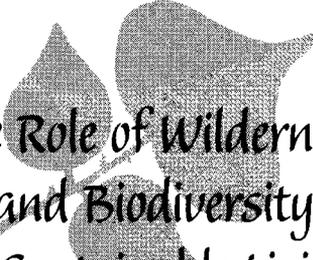
Finally, of course, the Secretariat did the hard, daily, overtime work without which nothing would have occurred: Krishnan Kutty (Executive Officer), Ms Shalini John, and Ms Lucy John were unstoppable in their commitment to, and hard work for, wilderness, wildlife and people. Ms Leona Graham was seconded from The WILD Foundation and worked with the crew in India as the Program Manager, and continued unfailingly as the staff editor for these proceedings.

Wilderness and wild places will continue to benefit from your hard work. Thank you.

SECTION I



*Global Wilderness,
Wildlife, &
Biodiversity*



The Role of Wilderness and Biodiversity in Sustainable Living

Kenton R. Miller

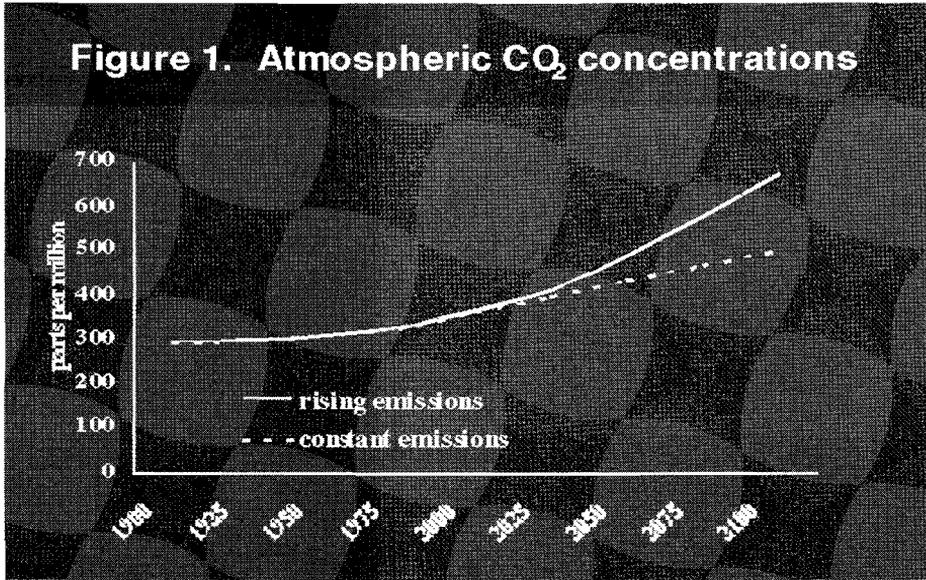
Special Places, Sacred Areas

Ancient cultures have protected certain places from people-caused change since the earliest of human times. They sought to protect their freshwater springs, their supplies of firewood and building materials, and their sources of medicinal plants. Sites of historic, religious, spiritual, and cultural significance have been assigned special places in the landscape within a mosaic of farms, hunting areas, harvested forests, and settlements. Some of these ancient protected areas are still found, having survived centuries of time and change. Many hinterland sites continue to serve for pilgrimages and rest, and communion with nature and the human spirit.

Modern and industrial societies also give special status to the places that are considered to possess outstanding values. Examples from around the world illustrate the diverse reasons for which different communities establish and manage these areas. In Bali centuries old irrigation systems provide for today's rice agriculture by drawing water from Lake Batur, which is considered to be a holy site by the local Hindu culture. In Brazil the Dos Orgoes National Park provides potable water to Rio de Janeiro. The Cibodas Reserve on Java offers firewood to local communities, while in Botswana safari hunting is an economically important use of wildlife. At the most southern tip of the Andes in the Torres del Paine National Park of Chile rugged hikers enter wilderness to pit their mountaineering skills against the dynamic elements of nature. Ecuador's Galapagos Islands National Park provides facilities to support research into that unique environment, while in Russia, the Cernozem Biosphere Reserve offers research opportunities on one of the world's most productive soils and maintains one of the last unplowed areas of steppe. Tigers have been restored in Rathambore Reserve in Rajasthan, while the buffer zone of Baluran National Park in eastern Java protects fishing services for local communities. Deep in the forest of Ujung Kulon National Park in far western Java survive some of the last Banteng, an ancient form of wild cattle. Environment education is a main theme of the Poas Volcano National Park in Costa Rica.

The concept of wildland-protected areas is neither an invention of this century nor an import from any one particular culture or region of the world. Presently over 33,000 places are being accorded special legal status as national parks and other types of protected areas by 252 countries. That represents almost 9 percent of the earth's surface. The World Commission on Protected Areas and the World Conservation Monitoring Centre have classified these areas according to the objectives for which individual countries manage them. Not included in this tally are the thousands of smaller sacred forests, community forests, wildlife reserves, and local government managed wildlands.

Nature and natural processes dominate most of these sites. Here, in the ideal case, streams flow unimpeded by waterworks. The sounds are of birds, mammals, insects, and flowing waters. Development of



roads, buildings, agriculture, and human settlements is limited. While most have felt the hand of human cultures as people have molded and shaped nature over the centuries in their search for sustenance and living space, nature's processes still dominate the landscape.

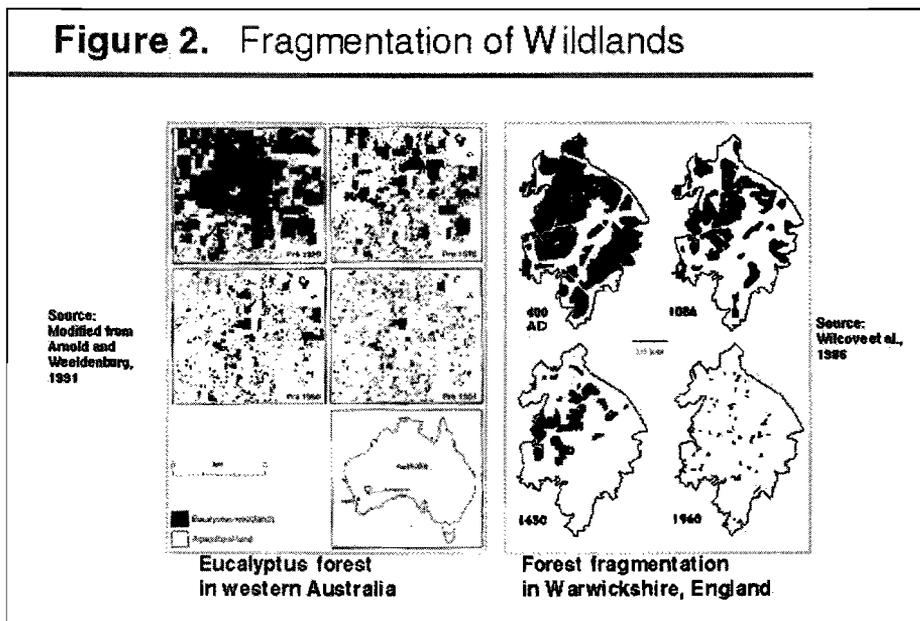
These sites are special for three important reasons:

1. The species and their genetic variations found in each site are unique forms of life. Should they become extinct, people have no capacity to re-create them.
2. The ecological functions that take place in each site, like pollination and detritus cycling, cannot be replaced by human-made technological inventions, nor could the economic cost be afforded.
3. These communities of life forms and their myriad interconnections and inorganic environments cannot be picked up and relocated geographically to accommodate human preferences.

The Convention for the Conservation of Biological Diversity in its Article 8(a) features protected area management as a central strategy for the maintenance of species, their genetic variation, and habitats around the world. Most ratifying nations have included their protected area programs as a component of their national biodiversity strategies and action plans.

Change and the Twenty-First Century

As we look to the future, communities and their governments are faced with a dramatic challenge with respect to the rapidly disappearing wildlands and the imperative to achieve sustainable livelihoods. Namely, in the face of global change in the twenty-first century, how can ecosystem services continue to meet the needs of people and other life forms? Scenarios drawn by scientists suggest major forces at work. Figure 1 illustrates the rising trend the increase in atmospheric carbon dioxide. Fragmentation is one of the most

Figure 2. Fragmentation of Wildlands

powerful forces responsible for the loss of biodiversity and ecosystem services. Figure 2 illustrates fragmentation at sites in the United Kingdom and Western Australia. Figures 3–5 illustrate the impact of these phenomena and other factors in terms of the “domestication” of landscapes from 1990 through 2050.

Wilderness, Ecosystem Services, and Sustainable Living

Natural ecosystems support nature and human communities in myriad ways. Figure 6 is adapted from the work of Costanza et al. (1997). The full array of goods and services derived from ecosystems are listed along the left-hand axis. A financial value is proposed for each good and service that enables the authors to rank the relative importance of each. While this work is still very much open to discussion amongst ecologists and economists, the study provides a useful framework to orient our understanding of the role of ecosystems in sustainable living.

For example, food security is dependent upon the cycling of nutrients and wastes in the soil and water. These services are suggested to be among the most valuable of all. The supply of fresh water and purification of air are similarly dependent upon well-functioning ecosystems. These services are not exchanged in the economy.

Interestingly, cultural values rank high on the list. Sites like Peru’s Machu Pichu National Reserve and the Kagar Alam in Bali illustrate how those societies have chosen to retain their cultural heritage and employ these sites to generate tourism income. In the Kakadu National Park in Australia, the Aboriginal community retains control over and administers access to their sacred sites within the area.

Those goods and services that we most commonly associate with natural ecosystems, including wood products, recreation, tourism, and genetic resources, appear to rank much lower in value. They are exchanged in the marketplace and carry monetary values.

Perhaps the most striking observation to be drawn from this analysis is that many of the services that governments and local communities appear to value most are not directly managed in our economies.

Figure 3.

1990

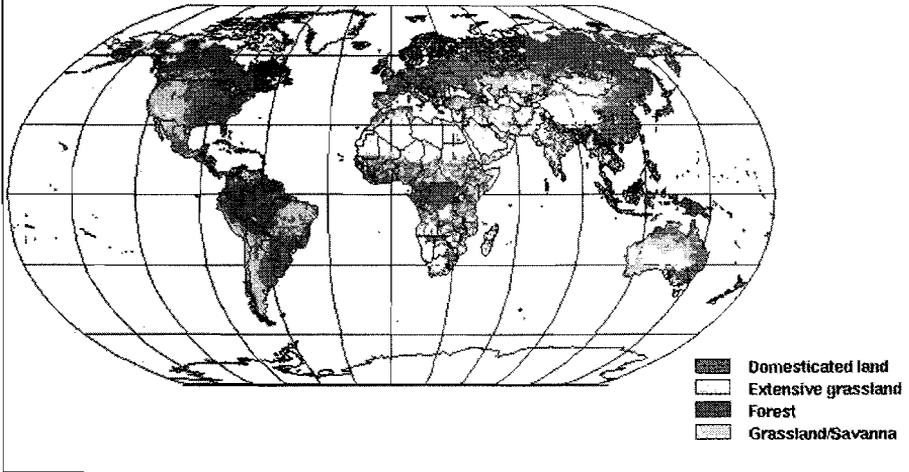


Figure 4.

2015

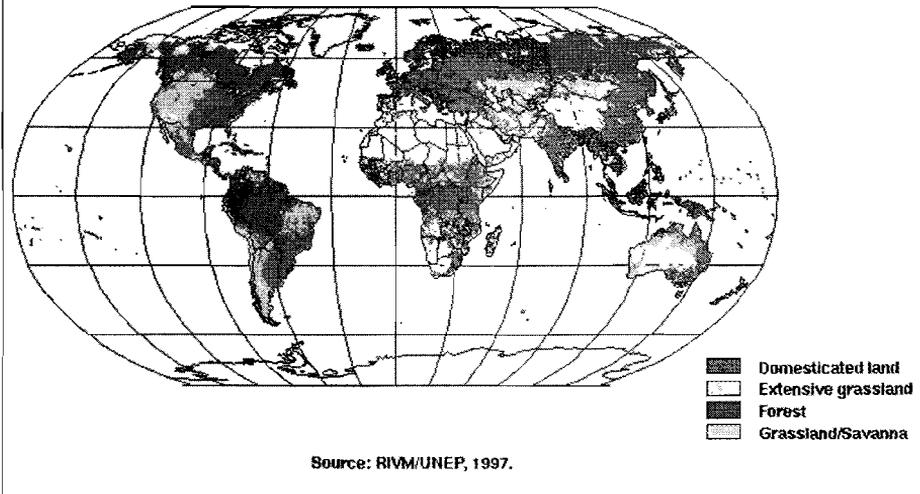
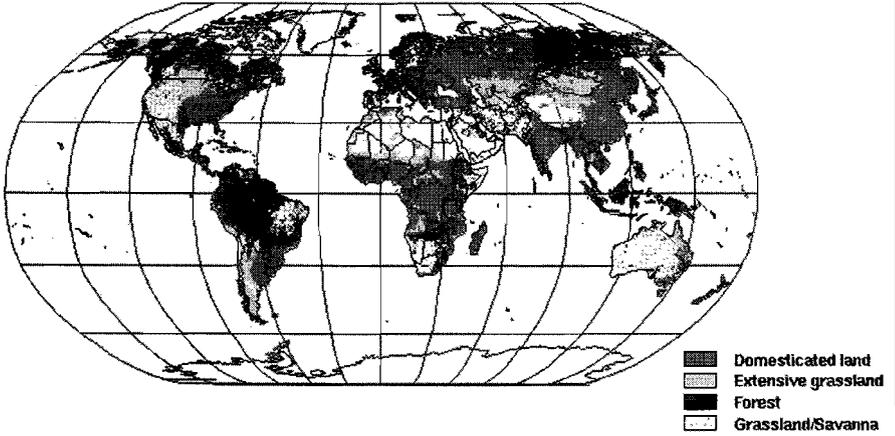


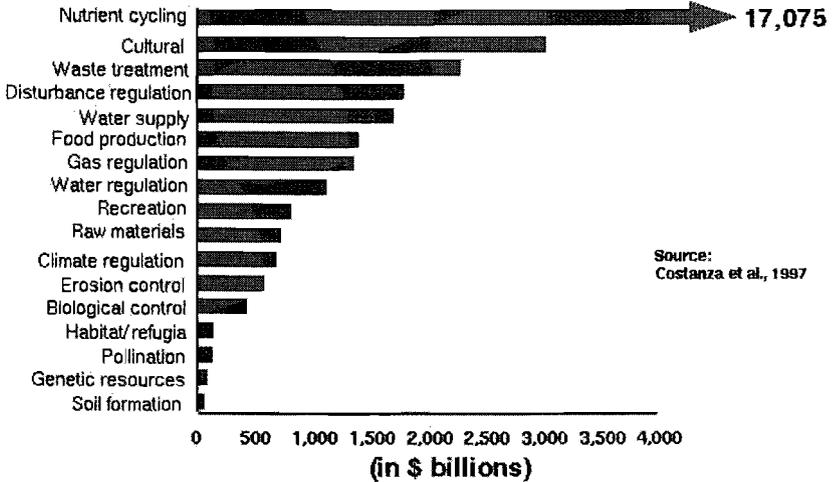
Figure 5.

2050



Source: RIVM/UNEP, 1997.

Figure 6. Our Understanding of Ecosystem Value is Increasing



They are taken for granted as “free” from nature. We do not generally invest and nurture these lands and waters to protect, restore, and enhance their capacity to produce these valued services.

As can be seen, wild and natural ecosystems are directly linked to the support of life itself. On ethical and moral grounds alone, we would wish to conclude that our nations and our communities must take steps to establish and maintain natural ecosystems throughout our landscapes. On more utilitarian grounds, natural ecosystems underpin the productivity of our soils and waters, the quality of our air, and our supplies of building materials and energy. They provide solace and the regeneration of our spirit. And, they harbor a panoply of secrets hidden in plants, molds, bacteria, and other living entities that provide us with medicines and future services yet undiscovered.

Strategies for the Twenty-First Century

If we want to work toward sustainable livelihoods we will need to invest in wildlands. We will need to manage them actively to provide the full gamut of ecosystem goods and services. Investment decisions are generally guided by economic criteria. As has been shown, many of the values most critical for human wants and needs are not quantified in monetary terms. Thus, investment and management decisions will need to be guided by a combination of economic tools, ecological knowledge, and cultural know-how.

In general, this means that community leaders, government officials responsible for natural resources, and wilderness activists should:

- *Rethink the goal:* In addition to the traditional values of wilderness that remain valid and singularly important to people everywhere, wilderness management should be credited for the provision of ecosystem services upon which human survival and qualities of life depend.
- *Reorient the approach:* Beyond simply establishing isolated wildland reserves as geographic islands apart from people, the approach must incorporate wilderness areas as components of regional landscapes where people live, work, and earn their livelihoods.
- *Respond to global concerns:* The factors of global change, for example, climate, population, pollution, agro-technology, urbanization, etc., will impact upon hinterlands. Biological corridors provide one mechanism to support migration among wilderness areas and adaptation of nature to the forces of change.
- *Reach out to potential partners:* Neighbors and other stakeholders can become partners in voluntary cooperative programs to help manage and protect ecosystem services, sacred sites, and biodiversity in their bioregion. The promotion of stewardship, participation, policy consistency, positive incentives, and appropriate arrangements of authority and responsibility between community and the state are key components of a facilitating environment.

In an ideal world ecologists suggest that up to 40 percent of each bioregion should consist of wildlands. In the Indian subcontinent and other regions where human settlement per hectare is already high, this goal will appear impractical. However, building sustainable landscapes and livelihoods will be the labor of a century. Steps can be taken over time to establish a landscape rich in biodiversity and flowing in ecosystem services. For example:

- Maintain remaining areas of wild nature.
- Over time, manage the variety of habitats in each bioregion to mimic nature's mosaic of patches to intersperse natural areas with agricultural and harvested forest areas, and settlements.
- Manage these patches to feature among them a variety of successional stages from old growth through the natural sequences of ecological development.
- Allow drought, wind, storm, and fire to influence the natural patches and foster dynamic change and diversity.
- Give particular attention to maintaining upstream catchment areas, wetlands, estuaries, mangroves, coral reefs, and forested areas.
- Where species have been extirpated, take steps to reintroduce them.
- Where exotics have been introduced, take steps to remove them.
- Restore those habitat types that have been excessively altered.
- Avoid driving species and their genetic variations to extinction.
- Avoid interrupting ecological functions, such as dams on rivers and jetties on coastal areas.
- Avoid locating major human interventions in areas critical to ecosystem service production, such as draining and filling wetlands and infrastructure development.
- Link key wildland patches and protected areas by corridors to facilitate adaptation to global change.
- Incorporate biodiversity-friendly practices into farming, fishing, and forestry.
- Establish social, institutional, and economic arrangements that foster stewardship, equity in the sharing of costs and benefits, and voluntary cooperation.
- Focus simultaneously on the actions needed at local, bioregional, national, and global levels.

Employ bioregional approaches to land use planning:

- Identify, select, and establish core wildland areas that will be retained in the landscape (see figure 7).
- Establish buffer zones around wildland core areas to provide a transition from wild to domestic land uses and space for managing negative impacts between them (see figure 8).
- Link core areas and buffer zones by corridors of nature-friendly landscape or seascape to provide for migration and for adaptation to global change (see figure 9).
- Manage core, buffer zones, and corridors as elements of greater ecosystems or bioregions—the matrix of which features farms, harvested forests, fishing areas, human settlements, and infrastructure (see figure 10).

Bioregional planning can be most successful when accompanied by steps to create an appropriate social and political environment. This includes:

- Participatory democracy among stakeholders.
- Appropriate levels of decentralization and devolution.
- Strengthened role of the central, state, and local governments to help communities and stakeholders gain new skills, exercise newly devolved authority responsibility, and establish the incentive structure to foster stewardship.
- Access to information and education for all stakeholders.
- Application of science and local knowledge.
- Removal of perverse policies and incentives, and establishment of a positive living and working environment.

Figure 7. Identify, select and establish core wild areas

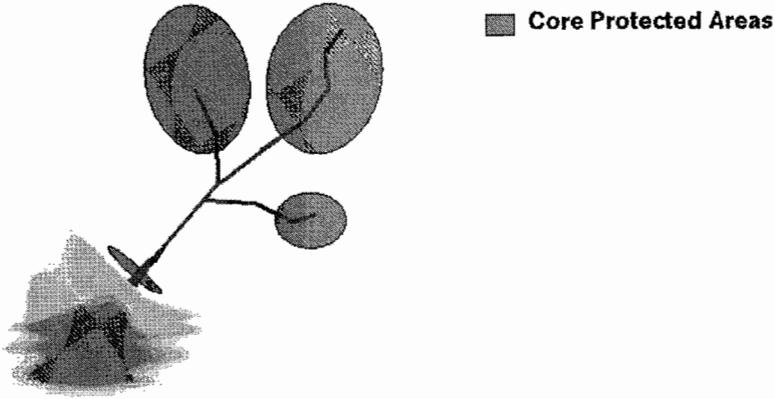


Figure 8. Establish buffer zones to existing and new sites

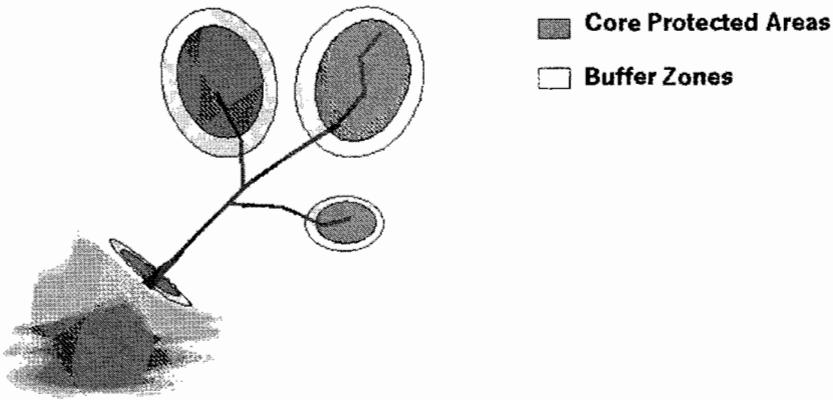


Figure 9. Link cores and buffer zones by corridors of nature-friendly land- or seascape

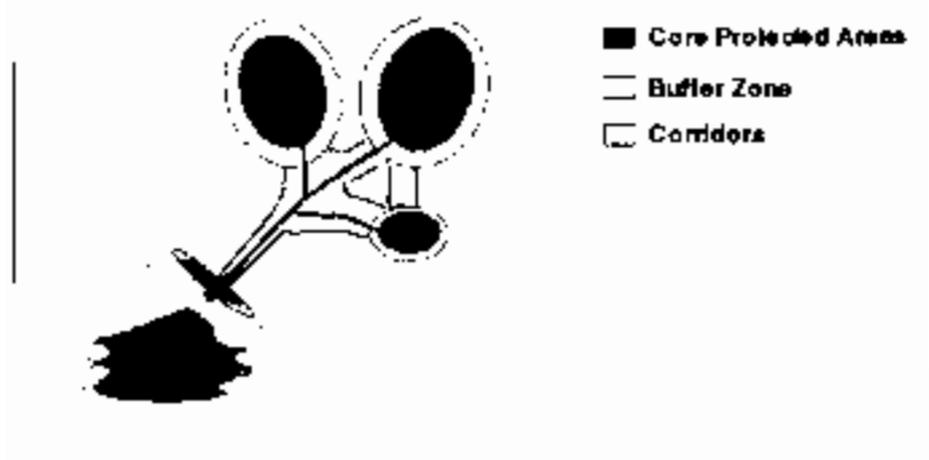


Figure 10. Manage core areas, buffer zones and corridors as fundamental components of working bioregions

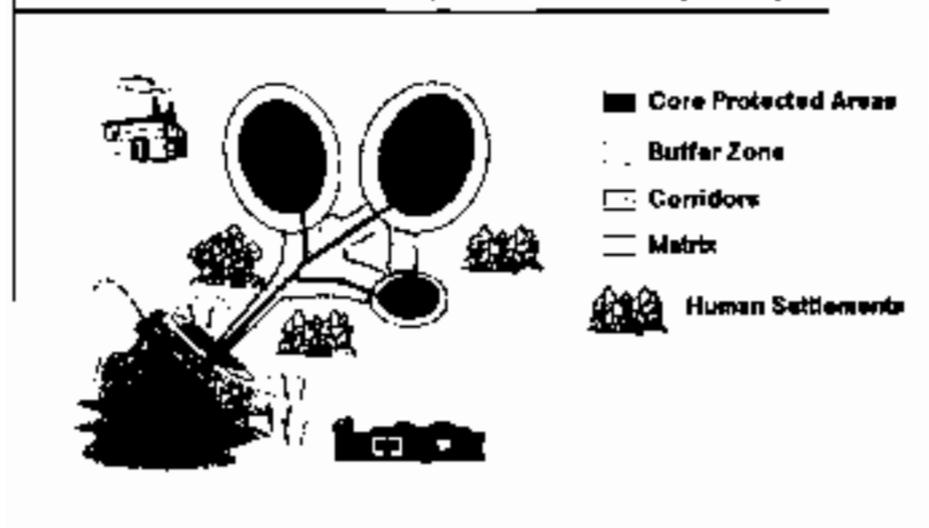


FIGURE 1: Categories of Protected Area.

The starting point must be a *definition of a protected area*. The definition adopted is derived from that of the workshop on Categories held at the IVth World Congress on National Parks and Protected Areas:

An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.

This definition embraces the “universe” of protected areas. All categories must fall within this definition. But although all protected areas meet the general purposes contained in this definition, in practice the precise purposes for which protected areas are managed differ greatly. The following are the main purposes of management:

- Scientific research
- Wilderness protection
- Preservation of species and genetic diversity
- Maintenance of environmental services
- Protection of specific natural and cultural features
- Tourism and recreation
- Education
- Sustainable use of resources from natural ecosystems
- Maintenance of cultural and traditional attributes

Having regard to the different mix and priorities accorded to these main management objectives, the following emerge clearly as distinct categories of protected areas:

Areas managed mainly for:

- I Strict protection (i.e., Strict Nature Reserve/Wilderness Area)
- II Ecosystems conservation and recreation (i.e., National Park)
- III Conservation of natural features (i.e., Natural Monument)
- IV Conservation through active management (i.e., Habitat/Species Management Area)
- V Landscape/seascape conservation and recreation (i.e., Protected Landscape/Seascape)
- VI Sustainable use of natural ecosystems (i.e., Managed Resource Protected Area)

However, most protected areas also serve a range of secondary management objectives.

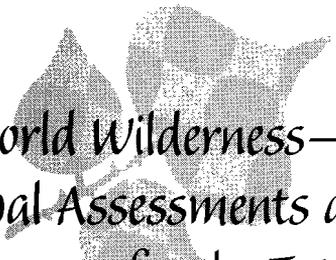
The relationship between management objectives and the categories is illustrated in matrix form in the table below. It is developed further in Part II, where each category is described, and through a range of examples presented in Part III.

This analysis is the foundation upon which the international system for categorizing protected areas was developed by IUCN and which is presented in these guidelines. There are several important features to note:

- The basis of categorization is by primary management objective.
- Assignment to a category is not a commentary on management effectiveness.
- The categories system is international.

Conclusion

- Sustainable living will depend upon a secure flow of ecosystem services, which are often linked with wild and semiwild places.
- Future landscapes will need to include patches of forest and other natural habitats.
- Some of these patches can serve society's needs for material, solace, cultural identity, and spiritual uplift.
- Other patches will need to be as large and as wild as possible to fulfill their ecological functions.
- These patches can be managed through different mechanisms of governance, but the continuity in their management as key ecosystems must be long term.
- For long-term survival, and therefore service to people and nature, these key sites need to be established and managed within a network of reserves connected by biodiversity-friendly corridors.
- Each society will seek its own approach to participatory democracy and governance to make this vision possible.



World Wilderness— Global Assessments and Prospects for the Future

Lee Hannah

Two inventories of world wilderness have been conducted in the past ten years, one based on human infrastructure (McClosky and Spalding 1989) and one based on ecological criteria (Hannah et al. 1994). These early efforts remain the only snapshots of world wilderness as we enter a new millennium. Reviewing global inventory in comparison to more detailed national inventories suggests that these studies provide important insights and that a major effort to improve inventory of wilderness worldwide is needed.

McClosky and Spalding surveyed world wilderness using human infrastructure criteria, including roads and buildings. Hannah et al. conducted a world wilderness inventory using habitat-based criteria, primarily using indicators of intensity of human use to define “predominantly natural” areas. The habitat-based definition of wilderness expands the area classified as wilderness into many biologically important areas. It also corresponds more closely to definitions that have been adopted in recent regional surveys, such as that for Australia. The value of the habitat approach is its ability to distinguish biologically intact wildlands from lands that simply show no present sign of humans. The two are often synonymous, but there are large areas of biologically intact wildlands that show some sign of humans, as well as areas that have been permanently altered by human action in the past that currently show no sign of human infrastructure.

This analysis examines the utility of the habitat-based approach by comparing its results with recent regional findings. The habitat-based inventory results correspond quite closely to the levels of habitat loss identified in the recent update of Myer’s Hotspot analysis. The extent of remaining natural areas in the global study corresponds remarkably well with the more detailed Australian wilderness inventory results. These findings indicate the utility of world inventory. Although the available world inventory is based on crude available data, it has considerable predictive power for interregional comparison. A coordinated effort is now required to allow intertemporal comparison based on improvement and updating of this data set.

The “Natural Map of the World”

The mapping of worldwide natural areas using human impact criteria has been called the “Natural Map of the World” (see figure 1). This map represents the spectrum from natural areas to human dominated landscapes. The map divides this spectrum into three parts: natural (undisturbed by human actions), partially natural (partially disturbed by human actions), and human dominated. The natural category is a good surrogate for wilderness. It represents large, predominantly natural areas that may or may not have human artifacts such as roads or structures.

Source material for this mapping consisted of over 1,000 individual map sheets from sources including the World Conservation Union, Food and Agricultural Organization, and journal and literature



FIGURE 1—Natural Map of the World (from Hannah et al. 1994). This map represents predominantly natural (light gray), partially natural (medium gray) and human dominated (black) areas of the world, derived from multiple data sources.

reference details available in Hannah et al. 1994; and Hannah et al. 1995). The minimum land area now mapped was 40,000 hectares. Where no other evidence was available and human population density exceeded 100 persons per square kilometer, an area was considered "human dominated."

This data set was compiled in 1991 and published in 1994, and some data was much older in many cases. Criteria for source date were most reliable and most recent. Data older than thirty years was excluded. Population was used where other data was missing. Despite drawbacks associated with data availability and use of population proxies this analysis remains our only global view of remaining wildness. It is therefore important to understand how representative it is.

DO WE KNOW WHAT WE'RE DOING TO THE PLANET?

To know whether the natural areas map is a reasonable representation of the state of the planet requires testing it against other, more detailed assessments. To do this, the natural areas map was compared to two regional assessments of habitat status and one alternative method of calculating global human impact.

The two regional assessments of habitat status were the Australian National Wilderness Inventory (NWI) and the recent update of Myer's Hotspot analysis by Conservation International (CI) (Mittermeier et al. 1998). The hotspot analysis is regional in the sense that it covers twenty-four regions of high endemism. It is extremely useful in comparison to the natural areas map because these twenty-four areas are based on a global assessment of endemism. Panels of experts were consulted to determine the amount of "original primary vegetation" remaining in each hotspot. This independent method provides a good test of the methods and results of the "natural" category of the global inventory.

The Australian inventory was more strictly regional and detailed study. The inventory contained information collected in field surveys completed with the cooperation of both state and territory governments between 1989 and 1994 (Levick and Madden 1995). These studies included vegetation mapping, land use assessment, and wilderness assessment to produce a baseline wilderness quality assessment. The staff conducting the Australian inventory kindly provided a reclassification of the inventory maps to make them directly comparable to the natural areas map: (distance, personal communication). This makes an excellent test of how representative the map is compared to more finely detailed regional studies. If the map

produces reasonable results compared to a well-documented study such as the Australian inventory, it may be expected to be useful in cross-regional comparisons and as an approximate representation in areas where no detailed regional study is available.

Finally, the natural areas map is compared to a similar map compiled from population data to test the notion that population alone would produce similar results. The population data set was that of Tobler (1997). The data set is based on a 5-minute-by-five-minute latitude/longitude grid of data from 19,035 subnational units for 219 countries of the world and is the most detailed global population map available. Additional details and the map itself are available on the University of California at Santa Barbara web site at <http://NCGIA@ucsb.edu>. The Tobler map was translated into the three categories of naturalness using the same rules applied to population in compiling the natural areas map (see Hannah et al. 1994). The two maps were then compared and cross-tabulated using ARCinfo GIS software (Horning, personal communication).

Applying these three tests should give a reasonable idea of the utility of the natural areas map. Good correspondence with the regional studies indicates that the natural areas map is useful for regional comparisons and as a broad baseline on which to build future monitoring. A positive result tells us that we can begin, with some level of certainty, to describe the impact human actions have had on the natural world.

Three Tests

A visual comparison of the natural areas map and the Australian NWI map is presented in figures 2 and 3. There is a striking similarity between the two maps. Heavy urban and agricultural development in Eastern Australia dominates in an arc from Queensland to Adelaide. Seminal natural pastureland extends inland in a second great arc, giving way to natural areas in the interior. A second belt of heavily disturbed land surrounds Perth. Both maps represent these patterns, and while the inventory map is clearly of higher resolution, the natural areas map faithfully re-creates the pattern at a courser scale.

The two maps also compare very closely in percentage of area in natural and human-modified categories. A numeric comparison of the two maps is presented in table 1. The percentage of Australia's national territory in each of the three naturalness classes agrees closely between the two maps. The natural areas map

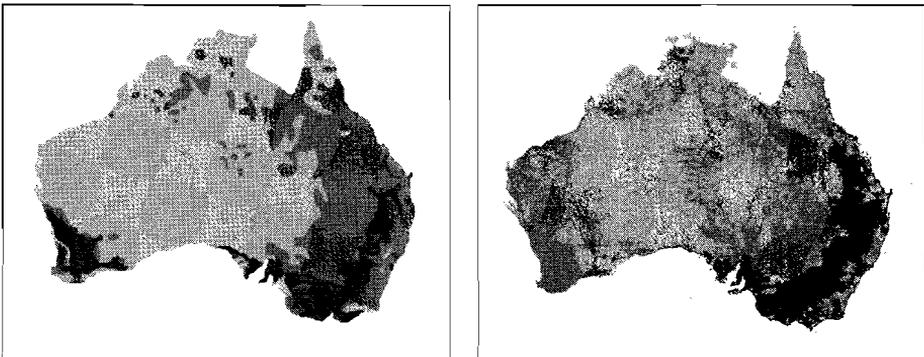


FIGURE 2—Natural and human disturbed areas of Australia (left) from the Natural Map of the World. The predominantly natural areas are represented in light gray, partially natural areas are represented in medium gray, and human dominated areas are represented in black. Note the strong similarity of pattern and area relationships of human dominated land in southern and eastern Australia, partially natural land in central eastern Australia and natural lands in western Australia with the much more detailed national data in the map (right) from the Australia National Wilderness Inventory.

TABLE 1: Comparison of Percentage Natural Areas, Australian NWI and Hannah et al.

<i>Category</i>	<i>Australian Wilderness Inventory*</i>	<i>Global Natural Areas Map</i>
Natural	53.9%	62.5%
Partially natural	30.0%	25.5%
Human- dominated	12.8%	12.0%

*NWI does not total to 100% due to 3.3% data being updated at the time of the compilation.

indicates more natural area than the Australian inventory. This is probably due to age of data, and indicates that the natural areas map is a global under representation of the degree of human destruction of natural habitat due to the continuing habitat destruction.

The percentages for “biophysical naturalness” from the Australian inventory (not illustrated here) indicate even less area in a natural state. Based on biophysical naturalness, only 45.3 percent of Australia remains in an essentially natural state (Torrance, personal communication). This indicates that Australia is one of those regions in which destruction of natural habitat has proceeded in excess of that indicated using human infrastructure as an index. For instance, pasture degradation by livestock and invasion of exotic species are destroying natural habitat in Australia even where roads have not penetrated. The result also underlines the underestimation of natural area or wilderness in the natural areas map.

Myer’s Hotspots, as updated by Mittermeier et al. (1998), provide a second check. Each hotspot has less than 25 percent “remaining pristine vegetation” by definition, and experts in each region were used to estimate levels of habitat loss. Table 2 presents the natural area percentage for each of the top ten of these hotspots from both the natural areas map and the hotspots experts’ opinion. In each case, expert opinion and the natural areas map is in close agreement. The only area in which the natural areas map significantly overestimates habitat is in the Atlantic Forest of Brazil. This is probably due to degradation of remaining forest fragments in this region, which excludes them from Mittermeier’s pristine vegetation, but is not detected in the natural areas map.

The only hotspots not ranked highly disturbed in the natural areas map are the Succulent Karoo of South Africa and the Caatinga of Brazil (these are not among the top ten hotspots listed in Table 2). The natural areas map shows both of these areas as having over 50 percent remaining natural habitat. The Caatinga is undergoing rapid conversion to soybeans and other land uses as modern agricultural techniques open up this difficult semi-arid land. These relatively recent changes were not reflected in the data available at the time the natural areas map was compiled. The Succulent Karoo is a delicate ecosystem that is little developed at present. Large areas of it are reasonably classed “natural” but might not meet the Myers/Mittermeier criteria of pristine vegetation.

A final test of the natural areas map is population. The natural areas map used population as a surrogate for habitat destruction. Why not use population for the whole map? Table 3 illustrates the answer to this question. There is on average less than 50 percent overlap between the natural areas map and a similar map using only population criteria. There are large areas of overlap, but these are in regions of ice, sand, taiga, and tundra in which there is little human activity and therefore identification of natural areas is relatively trivial. These have been factored out of the comparison in table 3.

This low level of correspondence results because the natural areas map used population only where no other data was available, and because the quality of local data is still superior to global population data-

TABLE 2: Comparison of Remaining Natural Habitat in Myer's Hotspots (Mittermeier et al. 1998) and the Global Natural Areas Map (Hannah et al. 1994).

<i>Hotspot</i>	<i>Global Natural Areas Map</i>	<i>Expert Opinion</i>
Philippines	3%	8.0%
Mediterranean	5%	4.7%
West Africa	6%	10.0%
Indochina	7%	4.9%
Caribbean	12%	11.3%
Madagascar	15%	9.9%
California	19%	24.7%
Atlantic Forest (Brazil)	20%	7.5%
Eastern Himalayas	23%	<25.0%
New Zealand	27%	22.0%

TABLE 3: Comparison of Natural Areas Map and Similar Map Generated Using Population Data Alone.

<i>Category</i>	<i>Agreement between Global Natural Areas Map and World Population Map*</i>
Natural	50.9% [^]
Partially natural	42.8%
Human-dominated	31.8%

*Transformed using the same population criteria applied in generating the natural areas map.

[^]Excluding rock, ice, sand, taiga, and tundra, which are generally unpopulated and natural.

bases. The application of population criteria in the natural areas map was primarily in very limited areas in which population was dense relative to carrying capacity (such as parts of Africa), but for which little land use data was available. The local population data for these areas was generally good relative to even the very recent global population data available. These results illustrate that population is only one part of the disturbance/naturalness story.

How to Capture the Moving Picture

This analysis shows that the natural areas map tells us a lot about the state of wilderness, naturalness, and human destruction of the planet. The problem is that it is a snapshot over a decade old. We know from regional studies in areas such as the central Amazon and Southeast Asia that ecosystems are being converted on a timescale of years, not decades. A more sophisticated tool is needed to capture this change on a global scale.

Annual mapping, while technically feasible, is prohibitively expensive and unnecessary. Much of the change captured in the natural areas map will persist from year to year. These areas need not be mapped frequently. Other areas are changing rapidly and need annual mapping. Still others are intermediate and can be mapped at several-year intervals. What is needed now is an organized system of triage to identify which areas are changing at what speed and to map them appropriately.

Some efforts are already moving in this direction. The World Resources Institute has initiated a monitoring program targeted at the rapidly changing forest frontiers of the world (Bryant et al. 1997). The Center for Applied Biodiversity Science of CI will begin a similar process for Myer's Hotspots this year (Fonseca and Mittermeier, personal communication).

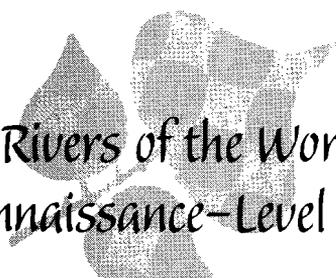
Yet no similar systems exist for wetlands, for deserts, for montane vegetation, or for a host of other key vegetation types. Most importantly, no coordinating mechanism exists to turn these monitoring fragments into a complete picture. Such a system is urgently needed. Without it, the natural areas map will remain our only picture of the state of global wilderness and natural areas.

Conclusion

Our overall understanding of the total amount of wilderness on this fragile planet comes almost entirely from two preliminary studies, each nearly a decade old. The present analysis has examined the second of these studies and concluded that the natural areas map serves as a reasonable milestone in our attempt to understand the natural condition of the planet. Unfortunately, a single milestone cannot capture the dynamic of intensifying destruction affecting natural areas worldwide.

To help the general public understand the rate of wilderness loss and to aid in conservation priority setting, more intensive and detailed inventories should be considered as we enter this new century. A targeted, triage approach is needed for global natural areas monitoring. Areas permanently damaged or under little threat need little monitoring. Areas under intensive pressure and experiencing rapid change should be monitored frequently.

Most importantly, a coordinating mechanism is needed to direct appropriate monitoring attention to different regions based on rate of change, and to consolidate results from frequently monitored and seldom monitored areas alike into a coherent global vision. Without such a coordinated effort, another view of the natural state of the entire planet may have to wait a millennium.



Wild Rivers of the World— A Reconnaissance-Level Survey

Michael McCloskey

Fewer and fewer of the world's rivers still flow freely and naturally with pure water. How many of them still do, and where can they be found? That is the subject of a study that the Sierra Club completed in 1998.

Because rivers drain most of the land on this planet, they reflect what happens within their catchment basins (or watersheds). They are sensitive indicators of ecological health. The healthiest rivers are those whose watersheds are least modified. Those that are free of dams, with natural banks and clean water, serve as benchmarks for purposes of comparison. These have sometimes been called “wild rivers.”

Freshwater ecosystems are disproportionately rich biologically. Twelve percent of all species of animals live in these systems, as do 41 percent of all species of fish (8,400 species). In most of the land areas of the world wild rivers are scarce because of ongoing development. These rivers are disappearing because of a panoply of threats.

At the outset, it is important to remember how relatively scarce freshwater is on this planet. Ninety-eight percent of all water is salt water—mainly as oceans. Only 2 percent is fresh, and only 13 percent of this is in liquid form on the surface (most of the rest is frozen in glaciers or is found underground).

The habitat provided by the planet's river systems is rapidly being degraded. Recent development has imperiled 20 percent of all the species of freshwater fish; some have become extinct. Thirty-six percent are imperiled in North America, 42 percent in Europe, and 63 percent in Southern Africa. Figures are not available for Asia, but the number must be great (for instance, 28 percent are imperiled in Sri Lanka). In North America, which has been studied extensively, other species are also in trouble: 67 percent of the mussels, 64 percent of the crayfish, and 35 percent of the amphibia are either in jeopardy or are extinct.

These trends have affected commercial fish catches too. Fish have disappeared in 80 percent of China's rivers because of degradation. In the United States, the commercial catch in the Missouri River has declined by 83 percent. The salmon catch in the Columbia River has declined by 94 percent, largely because of dams; the salmon must confront 136 dams there.

Dams are among the most permanent and devastating types of alterations to the ecology of rivers. There are over 40,000 large dams in the world, with a capacity of some 6,000 cubic kilometers. They cover an area the size of California, inundating 400,000 square kilometers. Over half of these dams are in China, and Brazil is building many large dams too. Thailand is in the midst of concerted efforts to build large dams on its rivers, especially in the upper Mekong River system. Over the last forty years some 60 million people have been dislocated by dams, with 21 million people dislocated in India alone.

Many of the world's best-known rivers are considered by the UN Environment Program to be polluted. These include:

- *Asia*—the Yangtze, the Mekong, the Irrawady, the Brahmaputra, the Ganges, the Indus, the Tigris, the Euphrates, the Amur, the Lena, and the Ob
- *Africa*—the Nile, the Zambezi, and the Niger
- *Europe*—the Volga, the Dneiper, the Danube, the Po, Rhone, the Guadalquivir, the Loire, the Seine, the Rhine, and the Severn
- *South America*—the Orinoco, the Magdalena, and the Paraguay
- *North America*—the Rio Grande, the Mississippi, the Missouri, the Ohio, Delaware, Sacramento, and the Fraser.

Under the burden of all of these pressures, pure, free-flowing rivers, “wild rivers,” are a vanishing resource. They are disappearing in the heavily settled parts of the world. Those that have somehow survived, often in remote sections, are precious resources.

Aim of Study

Because of the importance of natural riverine regimes, it is important to know how many of these regimes survive. Little research has been done to cast light on this subject. This study aims to provide a sense of what the situation is in this regard both on a global basis and by continent and countries. This reconnaissance-level study aims to provide a picture that is approximately correct, even if it is not entirely correct in all its details. It is hoped that this study will prompt others to undertake more detailed studies to confirm and refine its findings.

Methodology

This study derived its data from analyses of maps of the world, principally the U.S. Defense Mapping Agency’s Operational Charts of the world at a scale of 1:1,000,000 (ONCs). More detailed supplementary maps were used for most countries that could be found in the files of the Cartographic Collection of the U.S. Library of Congress. Background reports on the scale and location of development were also consulted.

In this study, a wild river is defined as a segment of any river of at least 50 kilometers in length that possessed certain characteristics. The segment had to be free of dams. No segments downstream from dams were regarded as wild since their flow regimes had been altered. Segments flowing through watersheds with signs of appreciable development that could degrade water quality were also not included. Roads and settlements were regarded as signs of such activity, which could include agriculture, manufacturing, mining, and urban pollution. No rivers were included that had roads running along their sides. Rivers were included that ran through territory that was only lightly developed (i.e., showing only small, scattered settlements), but not with moderate to heavy development.

Findings

The study identified 6,000 river segments around the world that still appeared to be wild (as defined above). If all of these segments are added together, the total comes to 781,051 kilometers. The average length of these segments is 130 kilometers.

As a percentage of all river lengths in the world, the percentage still appearing to be wild is 19.6 percent. In general, the wild rivers were found in the undeveloped portions of the world that are only lightly settled.

Two continents exceeded this average, both in the Western Hemisphere. North America retains the highest percentage of remaining wild rivers: 37.9 percent. Most of this is north of 53 degrees north latitude. South America still has 26.1 percent of its rivers wild, mostly in the Amazon basin.

Three other regions were below average. Eurasia still has 17 percent of its rivers wild; most of that is in eastern Siberia. Australia and Oceania have 10.6 percent. Surprisingly, Africa has the lowest percentage at 7.6 percent.

At the country level, contrasts and patterns emerge. Of all nations, Canada has the highest percentage of remaining wild rivers: 69 percent. Mozambique and Botswana have the next highest percentages: 48.5 percent and 36 percent respectively. In contrast, Russia has only 34 percent of its rivers still wild (though the figure is over 67 percent in eastern Siberia). Brazil, Paraguay, and Peru have about the same share: 35.9 percent, 35.1 percent, and 34.6 percent (see table 1).

Russia, however, has by far the greatest total length of wild rivers: 265,130 kilometers. This length is over one and half times more than its closest competitor, Canada, which has 162,683 kilometers. Brazil is next with 96,165 kilometers, with the United States next in line with 63,879 kilometers; however, most of this is in Alaska (see table 2).

TABLE 1—Countries with the Highest Percentages of Wild Rivers

<i>Country</i>	<i>Percent Wild</i>
1. Canada	69.2
2. Mozambique	48.5
3. Botswana	36.0
4. Brazil	35.9
5. Paraguay	35.1
6. Peru	34.6
7. Russia	34.0
8. Suriname	33.8
9. Columbia	29.2
10. Bolivia	29.1

TABLE 2—Countries with the Greatest Length of Wild Rivers

<i>Country</i>	<i>Total Wild Rivers (KM)</i>
1. Russia	265,130
2. Canada	162,683
3. Brazil	96,195
4. United States*	63,879
5. Peru	28,617
6. China	21,492
7. Columbia	16,260
8. Venezuela	11,850
9. Indonesia	10,847
10. Zambia	9,760

* Includes Alaska

Nearly 60 percent of the number of wild rivers is in just two countries: Russia (with 1854) and Canada (with 1440). Another 20 percent are in the United States (mainly Alaska), Brazil, and China (see Table 3).

In relation to their size, Peru and Panama exceed Canada in the relative density of wild rivers per square kilometer of territory. Other South and Central American countries also rank high on the density list: Suriname, Nicaragua, Columbia, and Venezuela (see table 4).

In terms of the average length of their segments of wild rivers, South American countries dominate. Venezuela leads the list at 320 kilometers, with Guyana (296 km.), Brazil (292 km.), and Bolivia (288 km.) following in that order. Suriname (211 km.), Paraguay (166 km.), and Peru (157 km.) are also on the list of the ten countries at the top of the list. However, ahead of these three countries are four African nations: Congo (219 km.), Ethiopia (181 km.), and Namibia (153 km.) (see table 5).

Among the longest of the wild rivers identified in this survey are the Yukon in Canada and the United States (2,800 km.), the Olenek in Russia (2,265 km.), the Mackenzie in Canada (1,510 km.), the Pracupi in Brazil (1,500 km.), the Kotuy in Russia (1,325 km.), the Taz in Russia (1,230 km.), the Jutai in Brazil (1,200 km.), as well as the Para Do Oeste there (1,200 km.); and the Churchill in Canada (1,075 km.). Not all of these are wild from their source to their mouth.

<i>Country</i>	<i>Number Wild</i>
1. Russia	1,854
2. Canada	1,440
3. United States*	547
4. Brazil	329
5. China	272
6. Peru	182
7. Columbia	124
8. Zambia	124
9. Indonesia	96
10. Zaire	75

* Includes Alaska

<i>Country</i>	<i>Density (KM/Sq KM)</i>
1. Peru	0.0223
2. Panama	0.0219
3. Canada	0.163
4. Suriname	0.0155
5. Nicaragua	0.0144
6. Columbia	0.0143
7. Venezuela	0.0130
8. Zambia	0.0130
9. Zimbabwe	0.0127
10. Malaysia	0.0119

TABLE 5—Countries with the Greatest Average Length of Wild Rivers

<i>Country</i>	<i>Average Length (KM)</i>
1. Venezuela	320
2. Guyana	296
3. Brazil	292
4. Bolivia	288
5. Congo	219
6. Suriname	210
7. Ethiopia	181
8. Paraguay	166
9. Peru	157
10. Namibia	153

TABLE 6—Wild River Summary By Continent

<i>Continent</i>	<i>No. of Wild Rivers</i>	<i>Wild Rivers (KM)</i>	<i>Ave Length (KM)</i>	<i>Percent Wild</i>
1. Africa	700	58,600	84	7.6
2. Australia & Oceania	186	18,836	101	10.6
3. Eurasia	2,291	298,640	130	17.0
4. North America	2,038	231,857	114	37.9
5. South America	785	173,118	221	26.1
6. WORLD	6,000	781,051	130	19.6

Interpretation

The low percentage of wild rivers in Africa is something of a surprise. While some countries there had high percentages (Mozambique with 48.5 percent, Botswana with 36 percent, Congo with 24.8 percent, and Ethiopia with 20.4 percent), this was offset by the low percentages of other countries (e.g., Angola with 6.8 percent, Cameroon with 3.6 percent, Kenya with 1 percent, Nigeria with 4.2 percent, Tanzania with 6.2 percent, Zaire with 5.2 percent, and Uganda with 5 percent). A number of countries also had percentages in between.

When one looks at the figures for Eurasia with the figures for Russia removed, the percentages tend to be very low. However, the wild river percentages for Papua New Guinea are 20 percent, for Mongolia they are 15 percent, for Malaysia they are 11.6 percent, for China they are 9.6 percent, for Bhutan they are 4.3 percent, and for Laos they are 2.4 percent. For India and the rest of Southeast Asia, they are under 1 percent. However, because of its size and despite a great many dams, China is fifth in the world in the number of wild rivers it has (272), and it is sixth in the total lengths of wild rivers (21,492 km.).

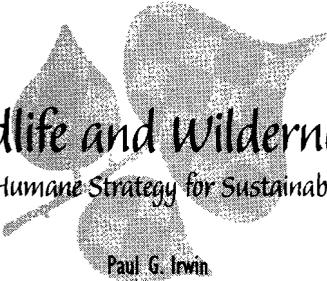
The position of the United States in this survey is anomalous. The percentage of remaining wild rivers for the coterminous states is only 5.1 percent. Eighty-four percent of its wild river lengths are in Alaska, which has few dams and little pollution. The density of wild rivers in Alaska is five times greater. But when Alaska is included in the total, the United States is third in the world in the number of its wild rivers and fourth in its lengths of wild rivers.

Limitations

The methodology that we utilized turns on the assumption that the key finding, i.e. the percentage of rivers still wild, will remain valid at different map scales. At the rough map scale used, only the larger rivers would be evident. While at a more detailed scale, additional wild rivers would be evident, so also would the total lengths of all rivers be greater—so the proportion would not change. Details available for the United States suggested that this relationship would hold true.

Conclusions

The value of wild rivers underlines the importance of knowing what is happening to them and tracking their fate. This study begins such an effort and establishes a frame of reference for more refined and focused studies. One can only hope that such studies will find that more wild rivers survive than we estimated. In any event, we need to know. As this resource becomes ever more rare, the urgency of acting grows. Nations need to inventory their wild rivers and establish programs to protect their purity and free-flowing character. Time is running out.



Wildlife and Wilderness:

The Humane Strategy for Sustainability

Paul G. Irwin

The core of human nature can be significantly impacted by our experience with wild animals and wilderness. For millions of years, our ancestors had their needs met by wild plants, wild animals, and wild landscapes. We learned to fear predators, to revere prey animals, to love and sustain our animal partners, and to treasure the wildlands that supported us. Our relations with family, allies, and enemies played out on a stage where all the rules were made by nature.

As we move into the new millennium, we carry this heritage with us. Even after thousands of years of advancing technology we remain, in many ways, strangers to civilization. The parts of us so deeply formed by our ancestral relationship to wild animals and wilderness struggle for balance in this unpredictable and ever-changing and increasingly unnatural new world. Our challenge is to build on our biological reality and to create mature relationships with wildlife and wilderness, based not on violence and domination, but on an ethic of compassion, respect, and stewardship.

The Humane Society of the United States (HSUS) and the Humane Society International (HSI) are dedicated to bringing about this mature, ethical relationship between the human species and all creatures that inhabit this planet with us. The keystones of this relationship are:

- respect for the unique and intrinsic value of every living creature,
- appreciation for the interdependence of all living beings, and
- obligation of our own species to be humane and generous stewards over the land and the creatures whose lives we touch.

To achieve such a world, the human species will have to become what it is not, namely mature and altruistic. Because the politics of the human condition dictate that no single group, nation, or perspective can guide us toward the maturity we seek, it is only through our ability to listen to each other, cooperate, and extend our horizons that we can shape a mutually enriching, humane, and sustainable world.

This cannot be an ethic of the elite. The benefits of this humane society must seek to touch every person in every corner of the globe, if it is to succeed—a lofty notion indeed.

The setting of this meeting, the great Asian subcontinent of India, dramatizes to the greatest extent imaginable the struggle to create a humane, sustainable society. No society on earth holds so deeply the values of reverence for life as do those of the Indian subcontinent. It is a land blessed with extraordinary landscapes and extraordinary wildlife—tigers, deer, elephants, monkeys, bats, and birds—and an extraordinary mix of peoples, beliefs, and cultures to match the natural wealth and beauty of the land. Yet nowhere else is this reverence for life, this richness of life, so forcefully challenged by the realities of human existence, the strain of human populations on the earth. Deforestation, flooding, soil erosion, and the disappearance of wildlife and

wilderness are signs of the failure of our species in India, as it is in the United States, to preserve the landscapes and the ecosystems that support us. In a land of reverence for life, people, animals, and the land suffer on a scale unimaginable to those who have not seen or experienced it. That is the paradox of India, and the dilemma we will all face if we fail to meet the challenges of creating a humane, sustainable society.

As we at the HSUS and HSI seek to meet this challenge, we are focusing our work on several areas that we consider critical to preserving wildlife, wilderness, and a livable human environment. The following will be discussed: sustainable use of wildlife, sustainable agriculture, and protection of wildlife and habitat.

Sustainable Use of Wildlife: Consumption versus Ecotourism

The HSUS and HSI are deeply committed to sustainable development and to the humane sustainable use of wildlife. Part and parcel of this commitment is our belief that local people can and must prosper alongside the wildlife and wilderness we are asking them to protect. And it is absolutely clear that wildlife can play a major role in building that prosperity.

However, we reject the idea that the route to humane sustainable development can be achieved through the destructive and consumptive use of wildlife. Consequently, the HSUS and HSI have opposed what is misleadingly called “sustainable use of wildlife.” To do this, we vigorously participate in the activities of the Convention on International Trade in Endangered Species of Wild Flora and Fauna, or CITES. We also founded and provide leadership to the Species Survival Network, a coalition of fifty organizations from around the world that works through CITES to protect wildlife everywhere. We recognize that India has been a good friend to animals and the animal protection community in the international deliberations of the CITES parties, and we acknowledge our debt of gratitude to our host country for its support.

A keystone of our work on wildlife trade issues is *Animals in Peril*, written by my friend and colleague John Hoyt and published in 1994. This extensively documented volume, which has never been credibly challenged, demonstrates conclusively that in developing countries, sustainable consumptive use of wildlife simply does not work. Whether through trade in wildlife and wildlife parts, or through trophy hunting, such consumptive use results inevitably in decimation of animal populations, destruction of local cultures, economic dislocation, and impoverishment of the land.

Each year, millions of animals—many endangered or threatened—enter international commercial trade. Their skins, fur, and ivory are sold as shoes, coats, and jewelry. Legal international wildlife trade is shadowed by extensive illegal trade. Together, this commerce threatens to drive many species to extinction.

The parties to CITES have recognized that international commercial trade must not be detrimental to the species, that is, it must be sustainable. But too often, use of a species is claimed to be sustainable in the absence of scientific evidence to support this claim. As a result of this irrational approach to wildlife use, the supposedly sustainable use of many species is proving to be nothing of the kind. The continental population of African elephants plummeted from 1.3 million in 1979 to 600,000 in 1989 due to the uncontrollable international ivory trade, which raged on despite the fact that an elaborate system had been set up by CITES to ensure the trade was sustainable.

Several factors act to virtually guarantee that consumptive use of wildlife will be unsustainable. Scientific information about the population being used is often scarce or of poor quality. Laws and regulations governing use are frequently inadequate, and enforcement of the laws that exist is erratic or nonexistent. Instead of following the precautionary principle, which dictates that, in the face of uncertain information, conservation should be favored, policy typically is driven by economic and political concerns.

Most importantly, the treatment of wild animals as commodities breeds an ethical bankruptcy that results in the death and cruel treatment of millions of animals in trade through simple callousness and indifference. At the height of the worldwide trade in wild birds in the early 1990s, the HSUS estimated that 30 million birds were captured to supply 7.5 million birds to the import markets. In other words, three birds died for every bird that reached per stores. And that was in the legal trade. The illegal trade, we believe, is much worse.

The humane community in the United States feels especially strong about the issue of wildlife in trade. It has taken more than a century for much of the wildlife of the United States to recover from the murderous binge of market-driven hunting and trapping that characterized the settlement of the American West in the nineteenth century. The image of millions of carcasses of bison, stripped of their hides and left to rot on the Great Plains, still haunts our national memory.

What is the alternative? The answer, or at least a significant part, is the subject of this conference: ecotourism.

Clearly, there is now broad international support for programs based on ecotourism and management of wildlife populations. Last year, the HSUS and HSI entered into an historic agreement with South Africa's National Parks Board. Our agreement contains elements vital to the quest for a more humane world.

As part of the agreement we actively participate in developing a cooperative ecotourism program that aids both the wildlife in South Africa's national parks and the local communities in areas surrounding the parks. The National Parks Board of South Africa has adopted the ideals and concepts of humane stewardship in the management and care of animals in South Africa's national parks. Under this agreement, the National Parks Board will continue to strive to resolve wildlife conflicts through land acquisitions, translocation, and the testing of novel scientific management techniques, with significant financial and technical support from the HSUS and HSI.

The HSUS and HSI support ecotourism because we believe it imparts value to, appreciation of, and compassion for wildlife and wild animals, consistent with our vision of building a more humane world. But we do this not just to counter those who value wild creatures only as wall trophies, but because it is part of a better economic model. In Africa, for example, it has been shown that an area of 10,000 hectares holds good stocks of wildlife. A sixty-bed lodge located in this area will, if properly managed and marketed, provide employment opportunities and a net income for a group ranch community of approximately U.S. \$83,000. It would be difficult for trophy hunting to provide this kind of local income in the short run; in the long run it would be impossible.

While we advocate ecotourism as a source of incentives for protecting wildlife and wilderness, we also know that wildlife does not recognize refuge boundaries, and that conflicts may arise between local peoples and formidable inhabitants of the wilderness such as elephants. Thus, the HSUS and HSI are investing in the development and dissemination of humane techniques and technologies for easing these conflicts. One of our flagship programs is our wildlife immuno-contraception research program. Indeed, a critical part of our cooperative endeavors with the South African National Parks is carrying out a joint study on the potential of the PZP, or Porcine Zona Pellucida, immuno-contraception vaccine to control African elephant populations in Kruger National Park and other smaller refuges in South Africa. Our field team has already shown that the vaccine does prevent pregnancy in elephants and that it can be delivered successfully in the field. The South African effort parallels HSUS programs in the United States and other parts of the world to field-test the vaccine on deer, wild horses, and other animals.

There are vast numbers of people willing to travel from the ends of the earth to spend a few nights in the African bush, or on an Indian reserve, to view the magnificent wildlife these grand places support.

These visitors will pay well for the privilege, and the funds they provide, together with the application of humane conflict resolution techniques, will assure that the animals will be alive in perpetuity.

Sustainable Agriculture

Food production and food security are key elements of any discussion of sustainability. The advocates of globalization point to the wonderful opportunities offered by the exchange of food products among peoples of the world. But globalization also encourages the development of inhumane, unsustainable, and environmentally hazardous agricultural practices in developed and undeveloped nations alike. And the truth is, most people would prefer to feed themselves.

Local and regional food systems offer people access to food and employment, as well as provide opportunities for humane local stewardship of natural resources. Unfortunately, many developing nations dedicate their farmlands to cash crops, which raise money to pay back international loans, meet the obligations of the central government, or attract revenue-hungry transnational corporations. These high-yield cash crops, which are generally grown as ecologically impoverished monocultures, often require the intensive application of fertilizers and pesticides as well as specialized seed stocks. For local people, the yield is not food for their consumption, but erosion, polluted water, depleted wildlife populations, and dependence on imported fuel, chemicals, and seeds.

Using the argument that "we must feed the world," developed countries such as the United States also adopt agricultural practices that are unsustainable as well as inhumane and environmentally devastating. In the United States, the family farm is increasingly being replaced by industrial scale corporate farming. Since World War II, 3 million American family farms have been lost. Meanwhile, record grain and soybean harvests (1998) in the United States are driving prices down and threaten to exceed the nation's storage capacity.

But the blight of U.S. agriculture is the factory farm. Once, livestock were dispersed at family-run farms across the nation. Wastes were disposed locally, and animals were integrated into the local ecosystem, the local economy, and local cultural life. But factory farms crowd together thousands, even tens of thousands of animals into a single cavernous building. The suffering of these animals is unimaginable. The wastes they produce defile our environment, poisoning streams, polluting the air, and killing wildlife.

In our pursuit of a humane, sustainable system of world food production, the HSUS and HSI are aggressively promoting local and regional food systems, organic agriculture, family and indigenous farms, and the humane treatment of farm animals. To advance this agenda, the HSUS participates in the activities of the UN Commission for Sustainable Development, and in the negotiation of the text for Agenda 21, the commission's annual set of nonbinding recommendations. After hosting the Commission Chair's Reception in April 1998, where we lobbied delegates while serving them locally produced organic foods, we succeeded in inserting language that favors local and regional foods, organic and sustainable agriculture, and the preservation of farmland. Our next goal, for the year 2000, is to insert language on the humane treatment of farm animals.

And at home, the HSUS Farm Animals and Sustainable Agriculture section works closely with grassroots groups to promote family farms and local food distribution systems, and to expose and oppose the horrors of the factory farm.

Protection and Preservation

Critics of our organization, of the animal protection movement in general, and of the more outspoken of the traditional environmental groups, often refer to us with great disdain as "preservationists."

Cynically, these self-proclaimed champions of sustainable use imply that we are idealistic, naive bunny-huggers and tree-huggers with no interest in or compassion for the struggling peoples of the world. Are we idealistic? Absolutely. Are we naive or indifferent to human needs? Absolutely not. The HSUS recognizes that wildlife and wilderness protection work best when people living near wildlife derive clear benefits from that wildlife and the wildlands that support them.

Are we “preservationists”? Yes we are, and we’re proud of it. We simply cannot believe that all the benefits of wildlife and wilderness are tangible and easily measured in terms of dollars, rupees, or whatever currency is in favor on the world markets. A humane ethic insists, instead, that nature is worth protecting for its own sake, and that the human species itself will be better off if some animals, some species, some land, are just left alone. Preserving nature for its own sake is a sign of respect for life, an acknowledgment of our origins in wilderness, a humble admission that we, as a species, are not the center of the universe, and a spiritual insurance policy against human pride and arrogance. We also believe it’s a smart course of action for a responsible trustee. Wildlife and wilderness is our natural capital. We should save some.

One group of wild animals that, we believe, deserves virtually absolute protection is the whales. Although whale watching, a form of marine ecotourism, has already shown itself to be a powerful engine for generating local revenue, whales deserve protection for their own sake. They are, in the original sense, awesome creatures. Their sheer size, their mysterious intelligence so formidable yet so unlike our own, and the unimaginable dimensions of their world command our respect. With the limited exception of subsistence, culturally embedded hunting by aboriginal peoples, a humane ethic offers no human justification for subjecting these magnificent creatures to the cruelty of hunting.

That is the policy we have pursued in our discussions with the International Whaling Commission (IWC). Since the IWC adopted a moratorium on commercial whaling in 1982, Japan, Norway, and other countries have used technical loopholes or simply ignored their treaty obligations to continue to kill whales for commercial purposes. Today, the so-called Irish Proposal, poses new threats to whales in the guise of compromise that would set up transitory no-whaling zones that would, in fact, provide no guarantee of permanent protection. We encourage and will support the Indian government and the governments of other peoples who cherish an ethic of reverence for life to lead efforts to preserve the world’s whales.

Another HSUS initiative to extend the humane ethic to wildlife and wildlands is the HSUS Wildlife Land Trust. The goal of the Wildlife Land Trust is simple: to preserve land as a true sanctuary for wildlife, one in which wild creatures need not fear the bulldozer, the gun, or the trap. The land trust is still a modest enterprise—currently, it is protecting over 1,860 hectares on twenty-nine properties in fifteen U.S. states. But the land trust is growing rapidly, increasing the acreage protected by 60 percent since May 1998. And its message of humane stewardship is a forceful one, and one that we hope will spread to all those who have responsibilities for the land.

Conclusion

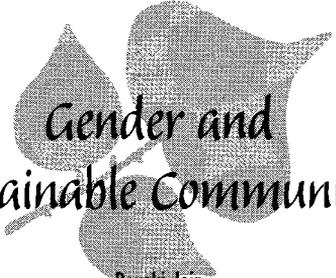
The deeper meaning of the Wildlife Land Trust is that if we are to achieve a truly humane, sustainable society, then our humane values must be extended to the land. Indeed, this message pervades our activities at the United Nations and at CITES, and all HSUS and HSI efforts to protect farm animals, wildlife, and habitat. Respecting the intrinsic value of individual creatures means respecting the land that supports them and gives them life.

Wilderness is that which gave life to our species and formed all the other creatures with whom we share our planet. Therefore, we owe our deepest respect to wilderness, and we acknowledge our obligation to preserve it for all future generations, human and animal.

SECTION II



The People
at the Heart of a
Healthy Planet



Gender and Sustainable Communities

Devaki Jain

When my brother, Mr. M. A. Partha Sarathy, chairman of the 6th WWC, mentioned to my father the growing interest in the concept of wilderness, my father had misgivings. The word *wilderness* comes from *wild*, with connotations of being uncontrolled, disorganized, wasteful, unreachable, insecure, and uncultivated. My father respected nature, natural resources, folk people, folk art, folk culture, and folk mores. He abhorred waste and was preoccupied with food security. He wanted to usher in a just and equitable world with human dignity. He often reproached me for using the word *tribe* for the tribals, because the word has been misrepresented, connoting something uncouth and uncultured. The word *wilderness* troubled him.

We often talk of being cast away in the wilderness. We talk of people who are lost in the wilderness, an unknown place. Yet my father also quoted Omar Khayyam, the great poet who wrote: "A jug of wine, a book of verse, and thou beside me in the wilderness. The wilderness were paradise, enow... ." Khayyam considered the wilderness no great place, but with a jug of wine and a book of verses and his beloved beside him it was paradise.

Through the years, Partha Sarathy showed my father films and shared conservation papers with him. Eventually, he persuaded my father that wilderness is, in fact, paradise. Wilderness is the paradise that my father had in mind when he worshiped nature, natural resources, land, and plants.

In discussing the subject of gender, I want to resonate with the discussions of my father and brother. To me, bringing the gender perspective to this congress is similar to showing that wilderness is the best landscape. In other words, I would propose that the spaces women occupy in life are the most important, most valuable, most environmentally enriching, most beautiful, most regenerating, least wasteful, most peace-making, and most confidence-building spaces. In other words, women occupy mainstream space. We need to change the language and the objective "to mainstream gender," suggesting that women are already in the clear mainstream. Let us bring the rest of the polluted and violent spaces and social categories into this mainstream, into this clear space.

Unfortunately, the way that ideas are expressed has led to statements like "women hold up half the sky," followed by statements that "women are in a situation where they are pleading for recognition." Or we say that we would like to claim and enter the space occupied by men and the mainstream. You may ask, what are these spaces?

A poet from Karnataka named Ramanujam had reflected on what he called "mother's tongue" and "father's speech." He referred to this in an introduction he wrote for a compilation of folktales from Karnataka. He illustrated that while women work in the kitchen, they tell stories to their children, thus forming the basis for the folktales we inherit. In these folktales, women speak in the local dialect because usually they have had no formal education. These stories are like parables, and often are the first source of

historical and cultural lessons. These parables enable children to distinguish between good and evil, and perhaps help them develop moral and political consciousness.

Karnataka then contrasts this to the father who sits in the drawing room. The father is stuffed up and formally dressed and tends to speak in what is called the “actual” language, which differs from the dialect. The father usually makes pompous speeches that have no relevance to the children’s education.

In a sense, Karnataka argues that the spaces women occupy—the kitchen, the dialect they speak, the knowledge they inherit in the form of parables—are far more significant in educating a child than the fathers’ spaces.

Another illustration can be drawn from the kind of work women do. In the developing world, the majority of women spend several hours each day contributing to the family and to the economy in what is referred to as nonmonetary activity. Yet the culture of the world and its value system is such that measures of value are only made in terms of money. Nonmonetary work, especially women’s work, is valuable because it sustains the earth and its citizens, but it remains unrecognized. According to United Nations Development Program’s 1995 Human Development Report, women’s uncounted contribution to the domestic product was U.S. \$11 trillion.

In the 1998 Human Development Report of the United Nations, the major theme was consumption—overconsumption and unbalanced consumption. The danger signals come in the form of paying too much attention to money and monetary activity. Danger signals can include environmental hazards, encroachment on natural resources, and the values being highlighted in a society, namely money and what it can buy.

Yet women occupy those spaces unidentified with money and thus unvalued. Broadening the space of women’s activity, giving recognition not to the monetary value but to the labor and the dedication put into those hours means putting a value on it. This would shift the emphasis away from money to what can be called “effort.” It will be found that women work and contribute more than men in hours of labor.

There are other examples from the economic domain. For example, women predominate amongst those who do what is called in economic classification free collection of forest produce. In many parts of the developing world, women will go into forests and collect berries, gums, bark, and even branches that are used for both traditional medicines (now considered by large industry as natural foods and natural medicine). On the other hand, the large-scale forest industry logs and cuts up trees for wood-based industries. Thus, women take parts of the trees that do not destroy the trees, whereas mainstream industry usually kills the trees.

The lack of sensitivity to this difference can be noticed in the way economics names these two activities. Major forest produce is cutting the trees for timber. Minor forest produce is what the women are gathering. Yet the value of minor forest produce and the number of workers engaged in this particular activity are greater than those engaged in major forest produce. Apart from the moral aspect, minor forest produce is a more conservation-oriented practice. But economic classification values it exactly the opposite of the way it should be valued.

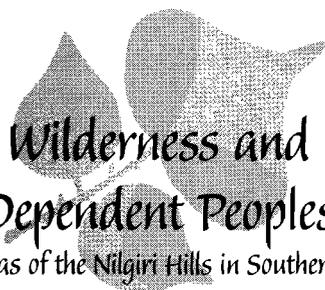
These examples illustrate how spaces occupied by women are, in fact, central to what is now the aim and vision for the world—sustainable human development.

The women’s issue is built around the issue of inequality and discrimination. But an element, which is more optimistic, is to see women as community. The community is composed of men, women, and children. In other words, a group of people differentiated not only by gender and age but also by class. In a conference held in Pietermaritzburg, South Africa, the impending dangers that South Africans would face were discussed—namely the possibility of 3 million children orphaned by the death of their parents through HIV-AIDS. It was argued that, so far, the community is absorbing these orphans because of

South African cultural values, which traditionally extend a hand of care to all kith and kin, especially children. A closer look at what is really happening shows that the people who are providing these shock absorbers are women. Further probing finds that the women are usually elderly, a majority of whom are pensioners. Thus, the notion of community concealed within itself the reality that certain individuals belonging to certain sects, namely female, provide what is assumed to be a responsibility and an effort of the entire community.

Today it is not popular to challenge the concept of community in any forum. Naturally, communities will always sustain and protect the earth from devastation. However, I would like to point out that within this community there is a need to recognize who actually bears the brunt of responsibility. By concealing such a major reality we perpetuate inequality and discrimination, for indeed, there exists a high level of unequal sharing of responsibility and thus discrimination in terms of workload. Since community work is also unpaid, the number of unpaid people in positions of social responsibility is naturally very high.

Gender concern needs to be transformed from an ideology drawing attention to women's unequal social position to an understanding that women occupy the most valuable spaces, both in a community's economy and what can be called the moral base of community. These spaces deserve identification and recognition, their value spoken of loud and clear, and an invitation extended to men and others to join this mainstream—a forward-looking, conserving, environmentally conscious mainstream.



Wilderness and Dependent Peoples

The Todas of the Nilgiri Hills in Southern India

Tarun Chhabra

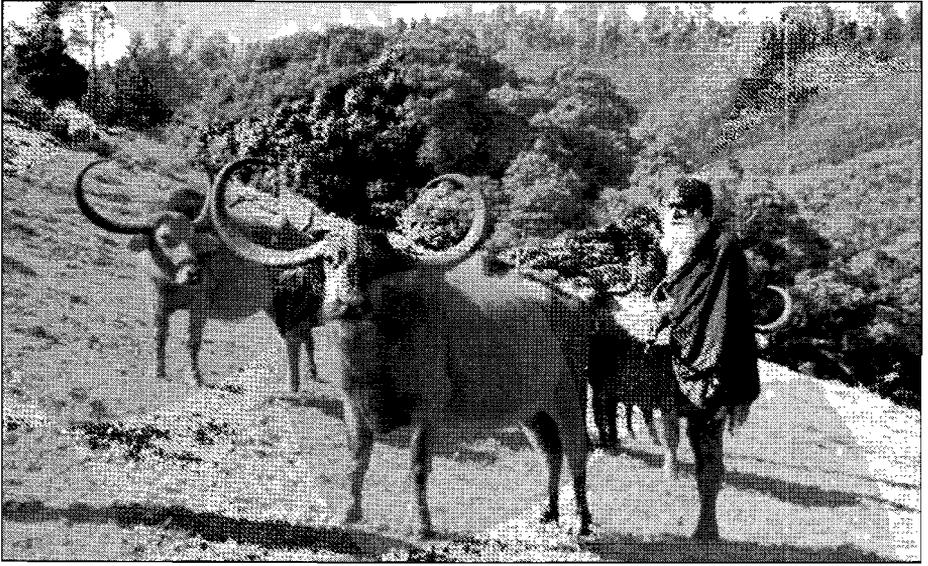
The Todas are one of the most ancient tribes in the upper Nilgiris of southern India. For over 5,000 years they have occupied the highlands of the Nilgiris in the most sustainable manner possible. That is why we need to learn about the timeless wisdom of these ancient people if we are to implement the “call for a sustainable future.” The following provides a glimpse into the Toda way of sustainable living.

A few centuries ago, the Todas, who have rarely numbered more than 1,000 people, occupied close to 1,000 square kilometers of pristine highland wilderness (from 1,830 to 2,590 meters). This area contains some of the most picturesque and biodiverse areas in the world. How did the Todas manage to maintain this population density without artificial methods of population control? They lived within the cycle of nature and recognized numerous sites and landmarks as highly sacred, sacred, and locally sacred.

Today we talk about sustainable use of wilderness to suit increasing population, but the Todas were wiser. They naturally controlled their population within sustainable levels and despite a total dependence upon their habitat, their natural environment did not show any strain, even after several thousand years. The Todas understood the need for maintaining a small population. Even today, they number around 1,300 persons.

All Toda spiritual values revolve around their wilderness. For every ritual, several floral forms were (and still are) required. Toda huts and temples were built from naturally occurring materials. Todas used specific migratory settlements during the drier summer months. And their large buffalo herds provided both spiritual and economic sustenance. The Toda also had a dreamtime when the gods and goddesses dwelled on the upper Nilgiri plateau. The deities went on to reside in nearby peaks that are today considered as resident deity hills. A devout Toda, on coming near such a deity peak, will do the peculiar *koimukhti* salvation while chanting the sacred prayer of that god. He will not even point his finger to indicate the location of the god-peak, but if pressed to do so might point at the neighboring hill and say “the peak next to that!” Natural landmarks associated with each of these divinities can be seen in the fields and are held sacred.

Toda prayers for each of the numerous dairy temples consist of sacred couplet chants or *kwarshn* to surrounding sacred elements of wilderness. The chants are usually directed at sacred peaks, rivers, slopes, thickets, trees, stones, pools, streams, swamps, paths, etc., in the vicinity. If a few important landmarks were to disappear due to development, then the dairy temple would face de-function. Thousands of sacred prayer sites in the forms of peaks, swamps, pools, streams, rocks, and thickets are associated with approximately 100 temples. Little wonder that the Todas have so magnificently preserved their surrounding wilderness. They are totally dependent culturally, economically, and spiritually on their natural environment.



A Toda Priest with sacred buffaloes.

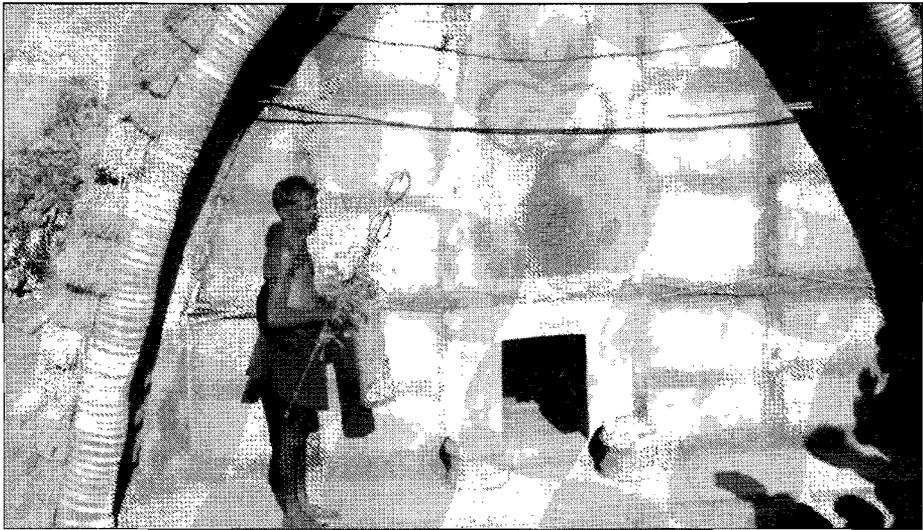


Natural rocky steps by which the spirits ascend.

A study of ancient Toda myths reveals another fascinating relationship between mythological sites and natural landmarks. For example, in the myth on the departing spirits journey to the afterworld of Amunawdr, the spirit is supposed to ascend natural rocky stone steps. We were amazed to find natural rocky steps in that specified area of wilderness. In fact, we found that natural landmarks correspond to approximately twelve mythological sites, which departing spirits are supposed to cross through. This unique link between mythological sites and natural landmarks can be seen for every ancient mythological story and explains why these elements of wilderness are preserved.

The highlands where the Toda hamlets exist provide catchment sources of water. Every Toda village, even today, requires several streams in the immediate vicinity. These streams serve many functions. For example, the sacred dairy temple streams are used by the priest for rituals within the temple. An ordination stream provides a place where a person can undergo elaborate ordination rituals that elevate him to priesthood. The domestic stream(s), and in the case of some very sacred temples, is a stream where the men bathe before proceeding toward the temple. Almost a dozen Hydel dams now exist in the Toda homeland, and they have destroyed many sacred rivers, streams, swamps, and even entire hamlets.

The Toda culture allows the use of only specified floral species in their rituals. Temples are only constructed of specified species of bamboo reeds (including one unidentified species),



Priest at dairy temple with sacred implements.

cane, thatch grass, tree poles, etc. Builders cannot substitute specified species with other nonspecified species. If any of these species became extinct, then Toda culture also could collapse. For example, the hatch grass that the Todas use on their temples was once found all over their homeland. Now it exists only in a few distant swamps. If this vital ingredient were to disappear, the Toda culture would collapse. Similarly, the numerous plant species used in various rituals from birth to funeral ceremonies are also specified and cannot be substituted with other plants. Each ritual requires the use of at least half a dozen plant species, so that throughout a Toda's lifetime, over a hundred floral species may be required in the rituals performed. The Todas cannot even think of using artificial materials in any cultural activity. Even to make fire in any ritual, fire-sticks of the plant *Litsea wightiana* are used, and fire is made by using friction.

Numerous other reasons explain why the Todas depend upon their surrounding wilderness. This intricate link becomes apparent in the language. The Todas have a specific name for almost every tree, bush, and flower in their area. As mentioned earlier, countless sacred landmarks also have specific prayer chant-couplets.

The Todas depend on herbs to cure various human and buffalo ailments. Some have been used as energizers, especially *ceropegia* and *satyrium* species. Todas use natural elements to model their huts after the rainbow and other implements. For example, their uniquely designed cane milk-churning stick is probably modeled after the kafehl flower. And indeed the flowers of this plant (*Ceropegia pusilla* and *ciliata*) exactly resemble a miniature Toda milk-churning stick.

They use flowers to denote the seasons and also to indicate the beginning, peak, and cessation of the monsoons. For example, when a particular flower, mawrsh (*Michelia nilagirica*) is in profusion, a Toda elder predicts the impending end of the southwest monsoon with unerring accuracy. They have used plants and flowers to denote the time of the day (e.g., the six o'clock flower, *Oenothera tetrapectera*), to indicate a man's wisdom (*Strobilanthes* sp.), and even to indicate the level of anxiety. Indeed, the worry flower (*Gentiana pedicellata*) closes if held by the stem when a person is worried and closes faster for more anxious people. The flower remains open if a person has no worries. Throughout the year, certain stars and planets have names that correspond to the names given to the weather. In addition, herbs with names identical to the planets, stars, and weather are in bloom. Elements of natural wilderness also are seen in

prehistoric rock art as well as in the unique Toda embroidery motifs of more recent times. The Todas have an intimate connection to the wilderness.

In honey gathering, the Todas have identified five different kinds of bees that prefer specific species of flowers that in turn make up the flavor, viscosity, and medicinal properties of the honey. They therefore have understood the specific pollinators of different flowers.

The Toda homeland makes up the core area of the Nilgiri Biosphere Reserve, which is one of the world's biodiversity hotspots. The Todas have succeeded in preserving this marvelous wilderness for reasons just explained. Hence, the simplest and most natural way to preserve the upper Nilgiri wilderness is by helping preserve Toda culture.

This is what we have been striving to do by starting the Toda Nalavaazvu Sangam—an association by and for the Todas. We have tried in a humble way to remind the Todas of their rich cultural heritage and the need to preserve it. Several very sacred temples have been reconstructed, rituals have been restarted, and migratory villages have been reoccupied.

Continued support is needed or the Toda culture could vanish, and along with it the wilderness and the unique spiritual natural heritage of this blessed land.



Empowering the Ecologically Handicapped

Dhrubajoti Ghosh

In 1996, because they could not earn a living, a dozen people committed suicide in the Sagar block in the Sunderbans region. A few kilometers from this place there is a village known as Bidhoba Palli, or “village of widows.” All the male members of this village have lost their lives in an effort to draw sustenance from the same ecosystem—either killed by the tigers, scissored by sharks, or envenomed by snakes. Other villages do not come up with a brighter scenario.

Since the beginning of civilization, humans were able to identify ecologically friendly patches of land and could choose such places for their settlement and sustenance. With the rise in population and in disparity of wealth, the weaker sections of the people began to encroach upon the patches, which were comparatively inhospitable for living and making a livelihood. As the population increased, poverty became much starker, and the poorest were forced to live in more difficult environments. Through no fault of their own, the communities, such as those living in the wetlands of the Sunderbans or the deserts of Rajasthan, are forced to sustain themselves in ecosystems that are hostile to them. The poor people, braving such systems, do not even have their risks covered by any kind of social insurance that can comprehensively take care of the uncertainties of survival. They are the ecologically handicapped.

Similarly, in Andhra Pradesh, more than 100 cotton farmers have committed suicide this season in Warangal District due to their inability to save their crop from destruction. They were unable to confront the hazards of the ecosystem from which they were forced to draw their livelihood. To them, the ecosystem became hostile. For the cotton growers of Andhra Pradesh, their ecosystem has been disabled by inappropriate intervention for rapid profits. These people also failed because they were rendered “ecologically handicapped.” There is a strong likelihood of a rising number of ecologically handicapped people, essentially because of rampant ecological degradation that is taking place all over. The matter deserves deeper understanding. How unsustainably is nature being exploited, who are the people in need of most priority attention, and so on?

Rapid Profits in Agriculture and Wilderness

Not long ago, Indian villages, like many other Asian villages, were self-reliant and hardly required any help from the outside world to sustain their lives and livelihood. Things have changed, and have changed, in many cases, beyond redemption. Introductions of seed, fertilizer, and pesticide have transformed the countryside into a “new ecological order.” The three alien interventions from outside the villages have transformed a reasonably self-reliant traditional village system into an externally regulated enterprise. In this new order, the traditional knowledge of the villagers of their own productive ecosystem, for a considerable part, has been laid ineffective. This “new ecological order,” which has colonized the old self-reliant agri-

culture, has contributed enormously to enhancing the grain production in the short term but has also brought phenomenal disorders to the environment, many of which cannot be restored.

Similarly, the most handsome profits of the pharmaceutical industry come from the very same areas that are inhabited by indigenous people and their knowledge about the medicinal properties of the plants that grow in the wilderness. None of the traditional knowledge is paid for. No system exists to acknowledge or repay such knowledge—no system of community copyright, so to speak. However, in India itself, out of the 7,500 species of wild plants used by the tribals for medicines, the pharmaceutical industry only knows about 3,500, which it exploits to generate a Rs. 1,000 crore business. The industry promises to grow to Rs. 4,000 crore by the year 2000. Worldwide, the herbal market is estimated at U.S. \$4 billion. Yet no riot has broken out.

The Obliging Exploited and the Obstinate Nature

Exploitation is an unequal transaction. Exploitation falls into two basic categories: exploitation within the society of the humans and by the humans; and the exploitation of nature. Both these forms of exploitation have been unavoidable prerequisites of all the modes of production since the dawn of civilization. Again, every event of exploitation carried out beyond the limit of tolerance (limits are rarely visible) causes perturbation and may even lead to the collapse of the very system of which it was a part. Thus, exploitation and inequality are both unavoidable and a fatal act of humans in the existing social order and mode of production.

In modern times, a quiet revolution has swept the world in the area of behavioral manipulation. Larger and larger communities and target groups are adopting the specific psyche tailored for them by those who rule. In fact, those who run the system have perfected the art and science of dampening the legitimate human responses to assaults and seem to have obtained a decree to perpetuate the exploitation. That the rich minority dislike to part with their "legitimate" wealth is in fact known to be a classical instinct with such humans. Effective use of the same tool of public response management is now set to influence environmental movements too.

Nature, on the contrary, could not be taken for granted to accept uncontrolled exploitation. Nature arrogantly has refused to become a sink for unlimited waste nor has it ensured unlimited use of natural resources. Every trespassing of threshold has had telling effects on human life.

Why this rebellion of nature? There are two basic reasons. The poorer countries continued with uncontrolled growth of population, and the rich countries continued with their phenomenal spree for improving their lifestyle that needed to exploit nature more and more. Thus, as the population doubles, an average person in an industrial country consumes more than 4,800 kilograms of coal equivalent in his lifetime as compared to a meager 527 kilograms available for an average person in a developing country. And therefore humans confront an adamant and threatening nature. In any natural system, perturbations are unavoidable if the boundaries are not respected.

Joining the Rebellion of Nature

Nature conservation is an unavoidable requirement of human survival. Unprecedented greed and uncontrolled exploitation has resulted in wanton dishonor of this fundamental prerequisite of ecological security, leading the future of humankind to its worst uncertainty. Fortunately, nature has been sending arrogant signals of disagreement for using it as a perpetual sink for uncontrolled disposal of waste

or as an unlimited provider of resources. So much so that people, mostly the impoverished, are dying in the process of negotiating with the disadvantages of their ecosystem. This rebellion of nature is the ultimate signal for humankind to amend its ways and means of living. One of the many natural disasters and hazards, the crisis of clean air and safe water, makes it possible to learn lessons and to work out the basic steps that bring back hope. Hope for us and the more so for our children.

The concern for the environment and for the victims of disorder is real and visible. Environmentalism is increasingly being recognized as the most critical responsibility of the present era that pertains to operations on the thin edge of our transactions with nature. Yet all such steps taken together fall far short of the need. To make things worse, the environmental movement has left suitable gaps for vested interests to flourish and considerably reduce the impact of even the small funds and knowledge that flow in to aid the disadvantaged millions. Such lacunae have further enhanced the challenge of environmentalism.

The tasks are clearly discernible. More effective and equitable institutional and scientific efforts that are funded need to take place. An equal need exists to create a stronger human resource base amongst the victims of disorder—the empowerment of the ecologically handicapped. In fact, it has been observed in the course of the last few decades that the success of the first task depends entirely upon that of the second and, therefore, the second task will have to be understood as central to the entire range of environmental actions to come.

Detailed analysis and understanding of umpteen conflict situations must be done and will take time. At the same time, a number of primary actions, which are clearly visible, such as the one outlined above, can be set into an agenda for the people to take up. Accordingly, three primary activities would be:

1. Understanding environmentalism
2. Empowering the ecologically handicapped
3. Regulating consumption inequity and abuse of natural resources

The significance of regulating consumption inequity cannot be overstressed. Neither can that of innumerable actions of abusing natural resources. However, less discussed and yet no less significant is the presence of a rightful legal regime for the impoverished. We may recall, as an example, that the pharmaceutical industry has been using traditional knowledge to reap explosive profits for which they pay a paltry sum, if any, to the custodians of this knowledge. Indeed, the unpaid knowledge has become one of the most lucrative sources of profit. As of today, no such legal regime exists to protect the intellectual property rights of the community. All these unequal transactions remain “legitimate.” The task of empowerment will remain incomplete without a reliable legal regime that protects the rights of the community to their knowledge base. The stiffest challenges are expected from those who have so far enjoyed the hidden profits of unpaid knowledge.

It is interesting to note that environmental education and awareness programs all over the world are aimed at those who are educated and assumes an education system in place. This leaves out most Indians, Africans, and others outside the scope of such efforts. And, it is amongst these people where most of the ecologically handicapped are found, and it will be these people who must be empowered to bring tangible changes to the existing order of uncontrolled exploitation. Educating the uneducated or the less educated therefore becomes the primary task for empowering the ecologically handicapped. This would also ensure a refreshing solidarity amongst the victims of disorders and the conscious and knowledgeable facilitators/change makers.

Conclusion

The environment in which most of us live has become bad and is becoming worse. A large section of humanity has a soil to till that is degraded every day; water to drink (if at all) that is unsafe; and air to breathe that is unclean. The ecosystem in which they live and from which they draw their sustenance is undergoing changes, some permanent.

The tasks are clearly discernible. More effective and equitable institutional and scientific efforts must be developed. An equal need exists to create a stronger human resource base amongst the victims of disorder—*the empowerment of the ecologically handicapped*. In fact, it has been observed over the course of the last few decades that the success of the first task depends entirely upon that of the second and, therefore, the second task will have to be understood as central to the entire range of environmental actions to come.

Empowering the ecologically handicapped will require understanding of the politics of impoverishment. Pauperization and impoverishment have been the classical features of the present-day economic order. Sustained impoverishment is the political theory of the powers that be, and battling them for better living conditions is the fundamental responsibility of environmentalism. The strategy to empower the ecologically handicapped, therefore, will have to rest upon this basic framework.

That the ecologically handicapped are denied access to minimum conditions of living and resources, and that there is a glaring inequity in consumption, are not accidents. They are the outcome of a faulted social order. This anarchy in consumption patterns will have to be controlled by imposing limits, using the kind of strategies as those that reduce emission levels for pollutants. In the fitness of things, such matters can best be pursued in a global convention on consumption inequity. Such a convention can be the best “bargaining counter” for the ecologically handicapped to negotiate favorable deals with the powers that be. This can be the beginning of environmentalism for the twenty-first century and set the footprints of ecological reforms: the new grammar for sustainable development.



Together, We Survive

Kusum Karnik

All living beings, including human beings, are totally dependent upon nature, the Mother Earth, and the soil that supports vegetation. They are like the children of this Mother Earth who nourishes them, nurtures them, and supports them. One cannot think of the existence of humans without nature.

I became aware of the symbiotic relationship between people and forests when I started working in the forests of Bhima-Shankar in the Western Ghat region in Pune district of Maharashtra, India, in 1980. This area is the dwelling place of a tribal group known as Mahadeo Koli. I observed that these people are dependent on their ecosystem with its undulating land, forests, rains, and seasons. The people have developed a lifestyle that can be described as a low-desire-level (LDL) lifestyle, and a knowledge-system based on their econiche. They use the forest in many different ways. A large portion of their food is gathered from nature in the form of fruits, flowers, leaves, bark, roots, tubers, mushrooms, honey, small game, crabs, and fish. They obtain medicinal plants, building materials, ritual materials, and wood for fuel and for making tools from the surrounding forests. In addition, "Sacred Groves" in the forests house their deities, all a part of how the wilderness provides for their peace of mind.

Their knowledge of what, when, and how to harvest is crucial and amazing, without which survival is impossible in this part of the world. This knowledge-system is an essential part of their lifestyle. The knowledge is gathered over generations and is passed on from generation to generation. There is no commercialization associated with it, and every member of the community is assured that it will be available whenever one needs it. Use of materials is controlled by rituals and taboos. Many such practices regulate their behavior toward each other and with nature, which contribute toward ensuring the long-term sustainability of resources.

One very important aspect of their lifestyle is their nonhoarding behavior. They get whatever they want from the forest, only when they need it, and then they get it fresh. They take only as much as they need and do not squander. They do not approve of a wasteful style of consumption. There are many examples of this in practice. They are generous and considerate with their own people, as well as guests, in offering food and shelter.

The women are the backbone of the community, serving it in many different ways. They work hard, at any time, whenever necessary, at home and in the forest, or in the fields along with men. So also, the women are given respect and freedom. Rape does not occur in this society. Children are treated in a very typical way so that they learn to respect the traditions and the elders, and at the same time they are given freedom, responsibility, and respect. When all the members of the society are taken care of, the society has a strong base. Such a society behaves in a mature way, making appropriate decisions at proper times with understanding, tolerance, and flexibility. This also leads to social and cultural sustainability.

The community is a valuable life-resource to these people, and they care for their community. Many major activities are done as a community, for example, decisions about agricultural operations, the site

selection for *jhum* cultivation, timing of sowing, weeding, and harvesting. These decisions are made in a collective way, which benefits families and communities. This system provides equity and less inequality. The community is nourished, respected, and then used as a life support. This makes life less expensive, less commercial, less wasteful, less market-dependent and so, self-dependent, comfortable, satisfying, assured, and contented.

Similar lifestyles can be observed in other ecotones where indigenous people or long-term residential people live. In the Kanha Forest of central India (Madhya Pradesh), the Baiga tribals have developed a suitable sustainable lifestyle. The name *Baiga* means the “protectors of the forest.” They are hunter-gatherers who know how to get their food from their forest, how to harvest it sustainably, and how to make the food nutritious.

In the Nagarhole Forest in Karnataka State of India, traditional villages have a very peculiar structure. In a valley, the village will have houses at the center, surrounded by the fields, after which there will be a circle of fruit trees, and then the forest encircling the whole village. When the elephants come to the area, they satisfy themselves first with the trees, then the fruits of the trees—especially the jackfruits, which are their favorite food; then, if they are still not satisfied, they might raid the crops, but the houses will be saved from them. And thus, a conflict between humans and wildlife is avoided. But the coffee plantations nearby do not have any such protection. They construct strong compounds, even electrifying wire fencing. They cut down the fruit trees, especially the jack-fruit trees, so that elephants are not attracted.

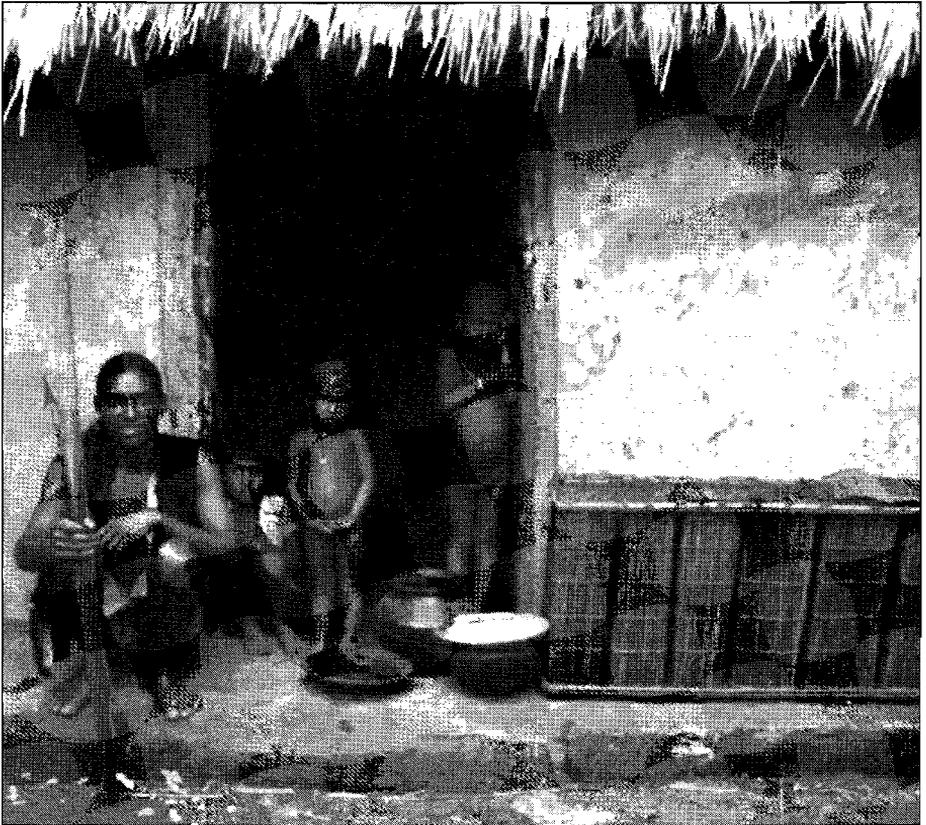


PHOTO BY SH. RAJANIKANT YADAV.

The coffee plantations, started by the British, continue to be run by people who wish to make money at any cost. The coffee plantations encroach upon the forests and shrink forest size. In addition, money-making teak plantations take the place of indigenous forests, which deters wildlife. Wildlife habitats have become fragmented. And as a result, elephants are roaming about the area, entering human settlements, raiding crops, and occasionally killing people, with those around them becoming antiwildlife.

In the northern part of West Bengal State in India, the tribal people have been residing in these forests in a sustainable way, but the tea plantations have disturbed the ecosystem by encroaching upon the forest. Wildcats, especially the panthers, have found the tea estates to be a very conducive habitat. They can live and breed in the tea bushes, get water easily, and can subsist on the domestic cattle and sheep and sometimes human beings. The result is that there is a conflict between humans and wildlife.

In Gir Forest in the state of Gujarat in India, the only habitat of the Asian lion, the local people are pastoralists who keep buffalo and cattle in herds. In Kadeli Ness (hamlet), a single joint family resides and subsists there. The family, a husband and wife, their two sons with wives and children, live in a sizable house. They have fifteen to twenty animals. The house is surrounded by a thick wall of thorny branches. This wall is so wide and high that the lions cannot penetrate or jump over it. The animals and people can live in peace and safety inside the compound at night. The milk and milk products are transported on camelback or by animal cart to the nearest marketplace and are sold to buy provisions.

The pastoralist community, the Dange Dhangars, had a very similar lifestyle in Radhanagari Forest in south Maharashtra, India. They used to keep large herds of cows, and these cows used to protect them from the wild animals like tigers. It was a peculiar way in which at night the family would sleep in the center and the herd would encircle them. The leaders in the cattle would keep watch from outside the circle. Tigers dared not attack.

Not only in the forest areas does one observe examples of ecopople, but also in coastal areas, in deserts, in high mountain peaks. Their life is hard and difficult, but it is also comfortable, peaceful, and satisfying.

If you think about the other areas of the world, the scenario is very different, and here you find the main causes of ecological problems. The cities are ballooning on all the sides. High-rise buildings are dominating the skyline, along with slums in between and around. The cities are centers of power—commercial, industrial, political, and cultural. The populations are increasing, and the demands for huge resources and infrastructural facilities are increasing and are becoming unsustainable. Competition of all kinds is on the increase, and with it, violence. Entertainment has become a part of life, and with it comes boredom. The lifestyle is based on consumerism, with no satisfaction, contentment, or peace of mind. Pollution has become an unavoidable factor. Human life has no value under these circumstances. Money has become all-important and is being used as an instrument of power and exploitation, with no consideration of ethical and human values.

Problems like deforestation; pollution; and contamination of water, air, and food; global warming; ozone-depletion; and weather changes are now too obvious to be ignored or denied. It is now proved beyond doubt that consumerism is at the root of these problems. The rich North, and even the rich North within the South, is certainly responsible for it. In the last few years, weather changes have made human life difficult and miserable for many people. Rising ocean levels have brought doom to island and coastal communities. Drought and floods, desertification and inundation, forest fires and cyclones are becoming common.

A few centuries ago, humans still accepted the close relationship between nature and themselves. The mountains, rivers, forests, deserts, and oceans have been like mothers to humankind ever since the beginning of human life on this planet. Humans loved, studied, worshiped, used, and protected their ecopole.



PHOTO BY SH. RAJANIKANT YADAV.

Societies have been clinging to their ecosystems. People understood that they were weak and vulnerable and that they depended on their ecosystems. They knew that together they could survive with nature around them.

But a change in attitude came about in the fourteenth century. The Renaissance, which gave rise to the Industrial Revolution, changed human thinking. The Cartesian philosophy came to be accepted, and everything became a kind of machine, including human beings, nature, and the earth. Machines were to be used, manipulated, exploited, and destroyed as per the desire, requirement, whims, and fancies of the controller, humans. Nature became a thing to be conquered, harnessed, used, and manipulated; and so the forests, rivers, animals, and humans became objects—machines. Sciences were developed, new inventions and discoveries were made, new machines were created, new ways of generating and harvesting power were discovered. The machines made large-scale production possible. Then there was the need for raw materials and markets to sell the products. So, new routes were found, new lands were discovered and conquered by force. Columbus, in reality, is a symbol of this cultural disease. He combined adventure with unlimited greed, inhuman cruelty, and disregard for ethical principles. Colonization became the order of the day.

The last few centuries have seen extensive colonization around the world and its horrifying effects. The colonizers made the poor people, the women, and the children in their own countries, the first colonies to be exploited. Later on, colonies were established all over the world. People were made slaves, transported over long distances, and treated with no mercy or consideration. People were killed in large numbers in many places like the United States, South America, Australia, and New Zealand, and their lands were taken away for colonization. Nature was also treated in the same way.

In India forests were considered common property. Under the British Raj forests were surveyed as a means of providing a means of protection and reserved forests. These were logged and turned into commercial plantations of timber. Forests were treated not as an ecosystem or a natural timber deposit. The selection of species was made on the basis of commercial value and not on the basis of needs of the local community or wildlife. Forests were wanted according to commercial working plans and this was said to be scientific forestry. The wilderness areas of forests were taken under working plans and villages were situated off as and when necessary under the name of forest villages. The communities were not interested in making a tree back and so they had to gather a lot of information, change the area, and made them an estate to replace them. This was a protest against forestry which in reality was a form of commercial exploitation and rural plunder. The forests were also used as hunting grounds for collecting trophies in order to get more revenue, people were encouraged to convert forestland into agricultural lands, or into tea, coffee, or rubber plantations. In India there were a lot of forest people who lived the semi-protected as a natural attitude.

After the survey was done, awareness came. The forest hunters became environmentalists and started taking about protecting certain areas and thus the idea of protected areas like sanctuaries and national parks became popular.

The first national park in the world was created in the United States in 1872 Yellowstone National Park. While establishing this park, 400 Indian people were confined in a set of six pitched huts, as they refused to vacate their lands where they had been living since time immemorial. Some people were forcibly evicted and ultimately the park was handed over to the U.S. Army to protect it from the angry Indian people who were the original owners.

In conformity with this park, many parks around the world were developed as a delivery process for public recreation. At that time, there was no problem with ecological management or wildlife protection. Yellowstone Parks containing bears, natural features, the tallest mountain lake in the North America, geysers, bubbling hot waterfalls, snow covered peaks, and an abundance of wildlife, spawned the birth of thousands of parks in and the world. For years, park managers strove to create parks based on this model and moved people, sometimes far away from the lands where they had lived for centuries. In India alone, to name would amount to parks like Sariska, Ranthambore, Nagarhole, Corbett, Dehradoon, and many others, people have been evicted bodily. In some places, people were not evicted until twenty years later. People's natural parks, stories of how they were thrown out in the same season. The forest department employees threw their bedding and clothes outside in the mud and pouring rain. They broke nests and let domestic animals loose. Two hundred families from Korba village in Korba National Park were evicted in July 1977 when the rains had already started. People found it very difficult to survive in the inadequate houses that were provided to them, with no time to cultivate and no other help. People were not given dry firewood to cook and to keep them warm. There are similar stories from all around India.

The Forests Protection under World Bank financing and guidance, is being applied to people from all protected areas in Madhya Pradesh. The forest project, the India Eco-Development Project, operates in seven national parks in India and is financed through a Government of India loan, a grant from the World Bank loan, which prescribes manner with a condition that it should not be to force, but should be voluntary. In India's conditions, under the Forest Department, with its colonial attitudes, no one can be forced by social or voluntary relocation, when the people are ignorant, are backward, illiterate, ill-equipped, and have been under the domination of the Forest Department for more than a century. These conditions exist in a lot of India's protected areas.

If one studies the ecological problem of today, one can easily locate the real cause of the problem. The main problem is the wasteful, consumerism lifestyle of rich people. They consume much more than forty times that of poor people. Add to this the wasteful use of natural resources. Many things are just thrown away. Many materials are just used as packing and decoration, and then thrown away as soon as the thing is unwrapped. Plastics, human-made fibers, and nylons become long-lasting wastes that do not degrade, plus they destroy soil fertility wherever they are dumped. Chemical fertilizers and pesticides contaminate soil, water, and food. Industrial pollution contaminates rainwater and air. The forests are logged indiscriminately and set on fire. All this is unsustainable.

And now we start to worry about the health of our planet, the biodiversity, the wild animals, and the wilderness. Yet instead of finding a real solution, the world turns to strategies such as globalization and liberalization. Everybody knows that this will aggravate the situation, but those in power are more worried about their own selfish interests. Nations, both rich and poor, have atomic capabilities and dump atomic wastes and chemicals—still, no one wants to think about the real reasons and real solutions.

One solution, environmental preservation, creates protected areas, sanctuaries, national parks, game reserves, and biosphere reserves. If you look at a map of the world, these areas are pinhead-sized dots that can hardly make the planet green and healthy. Increasing pressure comes from environmental and wildlife lobbies to create “protected areas” and then to evict people so that wilderness areas can be established and “save” the earth. The evicted people cared for the “Law of the Mother”—people like the Kogi Mamas, Baigas, Korbass, Mahadeo-Kolis, and Gujjars. The elder brothers of humanity believe, like most indigenous people, that their unwavering observance of the “Law of the Mother” will keep our world in balance.

We will have to accept that the fault lies with our lifestyle, which is greedy, wasteful, uncaring, and nonconductive to conservation of natural resources, forests, biodiversity, and wildlife. This lifestyle has other attributes. It leads to cutthroat competition where violence, aggression, possessiveness, and self-centeredness become the way of interacting with each other. Snatching, exploiting, colonizing, and dehumanizing others become virtues. Human populations are turning into human deserts. Society is being atomized. Human beings cannot survive under these situations. It is a path of destruction for everyone.

On the other hand, there is an alternate lifestyle—an LDL lifestyle, as practiced by many indigenous people. This lifestyle is noncompetitive, nonviolent, and society oriented; it leads to sharing and caring for each other as well as the Mother Earth. Tribal lifestyle—LDL lifestyle—is one option. To take this option, we will have to change significantly. Consumerism and luxurious lifestyles must be given up. Production not for markets but for the needs of the people should be done. Nonbiodegradable materials must be given up. Every activity that we do must be judged against certain principles of ecology and ethics. The tribals know that “together we survive,” together with our community, the community at large, with nature, and with our Mother Earth. We must follow the “Law of the Mother” (*Law of the Mother*, Elizabeth Kemf).

SECTION III



Wilderness
as a
Protected Area



Wilderness, India, and Developing Nations

His Excellency Shri. Khurshed Alam Khan,
the Governor of the State of Karnataka, India

Wilderness generally signifies those areas of the earth that have remained untouched by human activities. In contrast to the value assigned to urban areas, the wilderness, which consists of forests, open areas, and pristine nature, is relegated to signify less desirable areas in terms of resources. As we approach the twenty-first century, with rising demographic, industrial, and environmental pressures, it is clear that wilderness provides the only guarantee of our planet's health and capacity to sustain life. If we look at our environment, the hostility facing a multitude of living creatures is horrifying.

The chaotic and shortsighted exploitation of nature and the everlasting search for resources leads to the plunder of our natural wealth and denudation of the earth's crust, which produces a set of conflicting situations. Many marshes, grasslands, and forests have disappeared, along with associated flora and fauna.

Studies of the Amazon Basin clearly show us the consequence of extensive felling of forests. Global warming, which is caused by thoughtless industrial activities, is alarming and is being debated fervently in all forums. We are at present using about 70 percent of the soil suitable for farming, about 50 percent of the accretion of timber, about 10 percent of the flow of the world's rivers, and utilization of renewable resources is approaching its limit.

The degree of utilization is also extremely uneven and uneconomical. Every year millions of hectares of land are eroded, huge tracts of forests totally destroyed, and entire river basins are polluted. Humans are feverishly eating up all the earth's resources, which cannot be renewed. Every year the world loses 6.7 million hectares of soil.

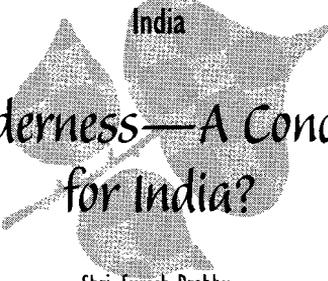
If we view this problem from a broader standpoint than that of economics, we find fresh cause for anxiety. Every year we pollute the atmosphere with over 200 million tons of carbon monoxide, over 50 million tons of various carbons, and about 146 million tons of nitric oxides. Enormous quantities of waste products from human activities enter the hydrosphere—oceans, seas, river, lakes, and underground waters. If the atmosphere becomes polluted, if the seas fill up with wastes, if pristine shorelines and the continental shelf no longer support marine life and the ozone layer is destroyed, the effects cannot be limited to a single country or to the present generation. Today, the world has shrunk into a small global village in all respects. Therefore, the repercussions will be felt worldwide.

The environment is a totality and every aspect must be considered as part of a whole. The answer to the problems lies in tempering our ambitions with ancient wisdom. All religions and philosophies have preached moderation. Relentless search for gain and greed portends global catastrophe. It is only by limiting human wants and desires and minimizing the needs of the poor that we can bring about a sparing use of earth's resources—an effort that would benefit all humankind. It is heartening to note that the 6th World

Wilderness Congress is addressing various issues confronting the existence of our globe and seriously looking for feasible solutions to avert the oncoming catastrophe.

As I have pointed out, it is possible to earmark large tracts of the earth's surface, particularly in Asia, Africa, and Latin America, as nature preserves. The Rio Summit, in fact, had discussed this as a major possibility for conserving the environment. This because these measures would limit the means for developing the full potential of the respective countries. Developed countries need to come forward with generous contributions that will conserve our common heritage.

I am sure that this congress will hold high not only the cause of social justice for ensuring an equitable access to resources but also the spiritual mission of ensuring for posterity their due legacy. In this great venture, I wish you the very best. May your endeavor meet with unbounded success.



Wilderness—A Concept for India?

Shri. Suresh Prabhu,

Minister for the Environment and Forests, Government of India

Wilderness as a concept is not new to us in this country, as it is deeply ingrained in our culture, ethos, and ethics. The concept of wilderness finds extensive mention in our mythological texts, in the form of Tapovan, which was an area used by our ancient sages for their hermitage and meditation. One of the characteristics of such an area is that it has to be free of human habitation and impact, which is similar to the current understanding of a wilderness area. In fact, nature conservation in general is a way of life with us. This is amply reflected in the various practices of ecological prudence that are followed by our people, and which result from an elaborate system of social restraints on the use of natural resources.

In the present day context also, I would like to view wilderness as a generic concept, which is synonymous with nature conservation as a whole, because this is crucial to the maintenance of environmental stability and ecological security of planet earth. Conservation of nature is the foundation on which sustainable development can take place to benefit humanity at large and for the survival of all living beings. It has tightly been said that the survival of humans is dependent on the survival of animal and plant life. This vision can be realized only when each one of us embraces the principles of nature conservation in our everyday lives.

India has an extensive network of protected areas, mainly national parks and sanctuaries, including tiger reserves and biosphere reserves, which together cover about 4.5 percent of our total geographical area. The core zones of these protected areas are managed as *sanctum-sanctora*, i.e., kept free from all human influence, to allow ecological functions and evolutionary processes to proceed unhindered. They are used only for ecological monitoring and research purposes. Such areas truly reflect the “wilderness concept” as internationally recognized. However, the nature conservation effort cannot be confined to protected areas alone and must encompass the surrounding human landscapes as well.

In the Indian situation and indeed in most developing countries, which have a high human and livestock density, it becomes all the more necessary for a systematic planning of the nature conservation effort. The protected area network must include areas that conform to the “wilderness” category, as well as to areas that are managed for species conservation, and to areas that meet the needs of local communities. With this view in mind, we are now proposing to introduce two new categories of protected areas under our national wildlife legislation. The two categories are “community reserves” and “conservation reserves.” Community reserves would provide a legal recognition of voluntary wildlife conservation effort by certain communities, such as those of the Bishnois in western India and some tribes in northeast India. Whereas conservation reserves would allow conservation of identified natural values in designated areas together with sustainable utilization of resources by local communities. We hope these two additional categories of protected areas will help resolve some of the conflicts that are arising between conservation and development needs in our part of the world.

Our Joint Forest Management and Food Development Programs have been initiated in response to the need for increasing resource use positions on state forests and protected areas respectively by fully involving the local communities in their management. These successful models of participatory management are now being extended to more areas. Our record in the field of in-situ conservation of plants and habitats is also quite good, considering the various prevailing constraints and limiting factors. We have the largest populations of tiger, the Asian elephant, the one horned rhino, and the only population of the Asian lion. The status of vertebrate and plant species is also reasonably secure, although a lot more needs to be done to improve our conservation efforts.

We are one of the few countries that has drafted a legislative framework on biological diversity and fulfilled our obligations under the Convention on Biological Diversity.

Nature conservation cannot be the preserve of any government departments or a few agencies and organizations. It cannot be dealt with in isolation, and it has to be incorporated into each and every aspect of national governance and policy formulation. Each one of us and every sector of development will have to contribute and involve themselves in this monumental task as we adopt the principle of sustainable living in our day-to-day lives by changing our resource consumption patterns and by actively participating in the various nature conservation programs and projects. We will not be able to realize the objectives of sustainable development. I see that the World Wilderness Congress, which is organized every three to four years in different parts of the world, plays a major role in spreading this message. I wish every success to the deliberations of this congress and hope that our international guests have a pleasant stay in our country.

I would like to end with a quote from the paleogeographer Henry David Thoreau who said, "True Wilderness is the presence of our world."

Imperatives of the Forestry Sector in India

Shobha Nath Rai

India could be termed as the most pressured land on this planet, along with Bangladesh. India has 16.1 percent of the world's human population and 15.1 percent of the world's livestock population. India occupies only 2.47 percent of the geographical area of the world and has only about 1 percent of the world's forestland. High population density causes enormous pressure on forests and other lands and has seriously degraded natural resources. Floods, acute shortages of biomass and drinking water, and dust in the atmosphere are some of the symptoms of land degradation.

Recorded forest area is approximately 23.3 percent, whereas the land having forest cover, discerned with satellite imagery, is 19.3 percent, and the scrub vegetation constitutes 1.7 percent of the land area. This leaves 2.3 percent of the total geographical area, which although recorded as forests, is totally devoid of tree growth. These could be the depleted forestlands, water bodies, and other lands bereft of vegetation, as in case of cold or hot desert conditions. India is one of a few countries that has been monitoring its forest cover on a two-year cycle by using satellite imagery.

So far six cycles of such assessment have been completed, and the forest cover of the country has ranged between 19.5 percent in 1981 through 1983, to 19.3 percent in 1993 through 1995. A time lag of two years occurs between procuring satellite data, processing it, ground checking, and publishing results. The Food and Agricultural Organization undertakes global forest assessment on a ten-year cycle, but it is planning to reduce it to five years. Recently, forest cover has decreased. The areas of grave concern have been in the northeastern states of Madhya Pradesh and Andhra Pradesh. The three states where forest cover has continuously increased during the past eight to ten years are the states of Rajasthan, Gujrat, and Karnataka.

India experiences seasonal rainfall, and most parts of the country remain dry from six to ten months. Manifestation of these seasonal rainfall patterns is that nearly 70 percent of the forests of the country are moist or dry-deciduous. The tropical rain forests and mangroves constitute about 13 percent, and the remaining 17 percent is subtropical or temperate or alpine vegetation. This lopsided distribution of rainfall also creates considerable difficulties in reforestation programs and affects survival and success. The main forest areas of the country are distributed into four major zones: (a) the foothills and the Himalayan ranges up to 4,000 meters in the northern states of Uttar Pradesh, Himachal Pradesh, Jammu, and Kashmir; (b) northeastern India; (c) central Indian states of Madhya Pradesh, Bihar, Maharashtra, Andhra Pradesh, and Orissa; and (d) the western Ghats region mainly in the states of Karnataka, Kerala, and Tamil Nadu.

As stated earlier, India experiences tremendous pressures. A study by the Forest Survey of India reveals that forests are harvested for five times more fuelwood and small timber than what can be sustainably produced over a long period of time. Studies by the same organization also indicate that nearly 74 percent of the forests support grazing and 53 percent experience fire. The combined effect of these pressures is that 74 percent of the forests lack natural regeneration. Consequently, these deleterious factors trap India's

forests in a vicious cycle of providing more than what they can sustainably produce, which in turn reduces natural regeneration and further exacerbates other problems faced by these lands.

During the 1980s India planted an average of 1.6 million hectares as plantations on forest and community lands. This volume of planting should have increased forest cover. However, the latest assessment by the Forest Survey of India shows that forest cover decreased to 5,482 square kilometers (between 1991 through 1993 and 1993 through 1995). Five earlier assessments of forest cover showed a marginal increase, and at other times showed some decrease. This illustrates that India's tree planting program, at its current level, cannot maintain the subsistence needs of the people. And if India wishes to increase forest cover, then reforestation and agroforestry efforts must be increased considerably.

Forestry Imperatives

Preceded by food and water, biomass is the next major need of humans. It is also said that after water, wood is the next most needed raw material. In fact, now the most widely accepted hypothesis for deforestation is population density. Forest resources play a vital role in meeting the subsistence needs of rural people, and they sustain the rural agricultural economy. The subsidies that the forest provides to agriculture include nutrients in water flow, leaf manure, fodder for livestock, food, quantity and quality of water, etc. Perhaps animal husbandry without the fodder and grazing support of the forest could be an uneconomic activity. Besides meeting the needs of the people and supporting agriculture, forests have their intrinsic value in protecting the land and regulating the water supply. Certain high priority areas, which are related to forests and trees, need urgent attention.

Dependence of the people is so inextricably linked with biomass resources that it is not easy to find an alternative resource. The real solution lies in restoring the productive potential of the land and in revegetating the degraded and barren areas. Simultaneously, agroforestry systems need attention, primarily to meet the daily needs of the people and not necessarily to provide a prime income generation source. Loss of forestlands needs to be halted, and already degraded lands need to be restocked to near optimal productivity. This appears to be a primarily silvicultural initiative. Social processes like participatory forest management, which are evolving, could help maintain sustainability in the long term. However, it would be prudent to ignore the ethos of the people and the political milieu. What is really needed is an intensive tree planting and ecorestoration program.

Most land degradation processes are accelerated due to anthropocentric factors. Considerable amounts of sediment and driftwood in water courses and deposition of infertile scree and gravel on fertile lands all indicate land degradation. Surface runoff, sheet erosion, wind erosion, and the negative effects of the absence of shelter belts compound these problems. All these processes permanently impact agricultural productivity and fertile lands. Trees, plantations, and forests can play a mitigating role in halting the process of land degradation. Trees reduce the adverse impact of rainfall and make it favorable because they regulate the flow of water. The litter and soil cover check surface erosion. The roots bind the soil and hold water in their mantle. Flow of water from forested and planted watersheds is free from sediments. Rows of trees on farmland offer several beneficial effects against wind, rain, and sun. Launching a national program for tree planting on vacant lands can check land degradation.

Getting people to participate in forestry initiatives and in land-based developmental activities is an important step. Still, the world is moving toward individual ownership and enterprise. Forests are vital and critical protectors of the land and water resources; they affect the health of land and govern the quality and quantity of water. In a primarily agrarian society, trees are indispensable. A pragmatic

approach must be employed to restore forests to their optimal health and to make trees a vital component of farming systems.

It may be mentioned that stocking of the open access high forests, practically in most parts of the country is decreasing, and it would be to the country's advantage to take notice of this reality. The factors for this again are the biomass needs of the people. The needs include fuelwood, fodder, livestock grazing, small timber, and nontimber forest products. In many tropical moist and dry forests, fire is a recurring event. Natural regeneration is also lacking. Forests experiencing low productivity and pressures from local people lead to further degradation. In a way, forests are caught in a vortex of perpetual degradation, which lowers their productivity and exacerbates problems with agricultural production. Human intervention by way of enrichment planting, ecorestoration, or reforestation is indispensable in such situations.

Trees play an important role in protecting the land and in augmenting agricultural and other biomass productivity. Beneficial effects include organic matter input and the binding action of the roots, which reduces soil erosion and controls the quality and quantity of water. With regards to livestock, the availability of the fodder from trees can reduce the dependence on agricultural crops. When forestlands are maintained, they can play an important role in meeting the fodder needs and in providing approximately 30 percent of the fodder needs. This proportion could be higher in hilly regions. Well-directed efforts in agroforestry can substantially reduce pressures on forestlands and can be extremely helpful in meeting the requirements of people.



This paper begins by celebrating the Indian wilderness. It also highlights the connection between a healthy environment and the quality of human life. Then it argues that wildlife and wilderness protection are the cornerstones of survival, not only for wild genes but also for millions of people such as fisher folk, forest-tribal communities, marginal farmers, and pastoral people whose sustenance is dependent more on nature's systems than on market systems.

No nation could possibly have asked for more from nature than India. Yet left in the charge of myopic economists and planners, the Indian subcontinent now lies wounded. Its water and ecological food security have both been placed at serious risk on account of the mismanagement and destruction of wilderness-survival assets such as rivers, lakes, grasslands, wetlands, forests, and even deserts. Unless wilderness protection is recognized as a critical national priority, and the process of replacing survival infrastructures with economic infrastructures is reversed, India will go the way of sub-Saharan Africa, with famines, water riots, and violence becoming the order of the day for millions.

As development-environment issues are debated in India, millions of trees are being felled, despite clearly stated policies against such forest stripping. The patina of legitimacy for such "ecocidal" acts are "development works" such as the construction of dams like the Turial Hydroelectric Project in Mizoram and the Narmada Project in Gujarat, Maharashtra, and Madhya Pradesh. The first sufferers of such wilderness-destroying policies are species such as the tiger, elephant, and rhino, followed by forest-dwelling human communities. The entire nation is down on its knees thanks to the combined effects of deforestation, which include landslides, tidal waves, floods, and droughts. This is the price we are paying for wasting our wilderness.

I am convinced that the whole economy of nature, with every fact on distribution, rarity, abundance, extinction, and variation, will be dimly seen or quite misunderstood.

*Charles Darwin:
Origin of Species, 1859*

The walk along Himachal Pradesh's deep Tirthan valley, from Gushaini to Kharongcha, then to Rolla and finally to Chalocha, should take no more than five hours. However, if the walking time is extended to a few days, the true wilderness, protected as part of the Great Himalayan National Park, reveals itself.

Virtually throughout, the slopes are clothed variously by blue pine, chir, oak, and rhododendron, interspersed with bamboo and sometimes marijuana. The handful of trekkers who actually do brave the trail will encounter dippers, forktails, redstarts, Mrs. Gould's sunbirds, flowerpeckers, tits, and raptors of all descriptions. Along the broad-leafed forested trails, leaves with neat circular holes in them betray the presence of Himalayan flying squirrels. At dawn and dusk their calls can be heard echoing across the valley as they traverse

their terrain by gliding gracefully from tree to tree, using air currents to adjust their trajectory for up to 100 meters at a stretch! Trekking further up along the slope from Chalocha to Nada at 3,200 meters (almost vertically for two or three hours), you encounter unparalleled western tragopan habitat. Ultimately, you reach snow leopard country where goral, Himalayan tahr, blue sheep, and ibex rule the slopes.

The high Himalayas protect India from the freezing winds of the north. Its snows slake the thirst of over 300 million people. Its influence on the climate of the subcontinent has resulted in an unparalleled biodiversity that survives in our deserts, grasslands, scrublands, swamps, dry and wet tropical forests, and a productive marine ecosystem that has not yet been fully documented. This is the land of the tiger, the elephant, the blind Gangetic dolphin, the great Indian bustard, and Wroughton's freetail bat. No human society was responsible for crafting this miraculous and fertile natural wealth. The credit for this incredible accomplishment goes to the dragonflies that flit above our wetlands, the moths and bats that carry pollen and seeds over vast distances, the whitewinged wood duck that inhabits river habitats in the Namdapha Tiger Reserve, and the macaques that planted wild mangoes in the four corners of India.

In a sense, the dragonfly is the wilderness. As is the reed on which it rests, the grass in the forest meadow, and the deer whose life is determined by the availability of grass. As for the tiger that hunts the deer, it has long been not merely the symbol of conservation in India, but the very essence of what is "Indian." Together with the bees, bats, and bears that pollinate and disperse seeds to the far corners of the earth, the tiger too is the wilderness.

Washed by the southeast monsoon, even the sounds that punctuate the silence of the forest are the wilderness. With each passing day in Kerala's Silent Valley and Karnataka's Bandipur, the rains approach and a diversity of birds can be seen searching desperately for suitable nesting sites. At this time, along tree-fringed rivers, forest pools, and even streamlets, a jungle symphony may be heard as males carve out territories using birdsong in "musical aggression" to keep competitors at bay, even as females send out their songs to attract mates. In the sub-Himalayan Corbett Tiger Reserve and Rajaji National Park, doves, copper-smiths, mynas, flycatchers, and thrushes work furiously at their predetermined tasks, programmed by genetic impulses imbedded eons ago. Occasionally, a whitebreasted kingfisher will screech dominance over the forests of the Bandhavgadh Tiger Reserve, the call carrying for hundreds of meters in all directions. Langurs, chital, and the occasional peacock complete the philharmonic performance, their whoops, screams, and cries supplementing the wilderness's audio offerings to perfection.

The magic and harmony inherent in this wonder-world, and the relationship between the myriad life forms and the plants in their forest home gave rise to almost all the living cultures we see on the Indian subcontinent today. The symbol of this natural bounty is water. Our ancients believed that the "Forest is the Mother of the River." They worshipped every large- and small-forested water source. Directly and indirectly it is the wilderness that feeds the Indian people, not their government. In seeking protection for the wilderness we seek much more than the survival of wild genes, or even the spirit of human communities. We defend the survival and sustainability of one-sixth of humanity.

How the Wilderness Was Wasted

Tragically, in chasing dreams of development ensconced in the now-famous "Tryst with Destiny" speech delivered by Jawaharlal Nehru, India's first prime minister in 1947, we have consistently devalued our natural heritage over the past five decades. What is more, egged on by the advice of economists indoctrinated by the World Bank, we continue to ransack survival assets by converting them to cash in a cold-blooded act of intergenerational colonization. Today, our forests are virtually gone. Our coastal waters are fast turning

into a toxic soup. Our aquifers have been so poisoned with industrial and agricultural effluents that it will take at least two or three hundred years (and as yet undiscovered techniques) to make much of our drinking water fit for human consumption again. The air in our cities is not breathable, and tap water contains fecal matter. Breast milk in parts of the Punjab is so contaminated by DDT that it should actually be kept out of reach of children. Nuclear plants such as Tarapur, just outside Mumbai, spew radiation in doses to which no civilized nation should expect its citizens to be exposed. Almost all Himalayan forests outside the purview of the Wildlife (Protection) Act 1972 are in tatters. And one tiger loses its life to poachers every day. This, we term “development.”

Of late, the World Bank has even turned its lethal, unwelcome gaze toward wildlife reserves such as the Great Himalayan National Park. Here the World Bank has pumped in large sums of money through the Global Environment Facility (GEF) to blast new mule tracks that have led to severe siltation of the magical Tirthan River. More seriously, the trails have opened portals for “outsiders” to enter the protected valley. It is only a matter of time before the wilderness that the World Bank ostensibly wants to “protect” begins to fray. Almost every Indian state is currently in the process of assassinating its surviving wilderness under pressure from the World Bank, which seeks to “increase the productivity” of tropical forests through forestry projects that are thinly disguised logging schemes. Ill-advised initiatives such as the GEF-funded ecodevelopment projects further insinuate the bank’s worldview into the very heart of communities such as the Maldharis of Gir who had lived peaceably with the wilderness of the Asiatic lion for eons. When the idea of ecodevelopment was first mooted in small meetings that took place over a decade ago the word *eco* stood in for *ecological*. Today, the World Bank has taken it to mean “economic,” and therein lies the rub. In place of earth communities, in scores of our most vulnerable wilderness, we can now anticipate the arrival of cement companies in search of limestone, industries in search of labor, and chemical agriculture that seeks to deliver food to distant cities.

Though he had no way of predicting the speed with which *Homo sapiens* would ravage the earth, Darwin’s insight into human nature prompted him to make an observation that is particularly relevant to an India that is virtually supervising the demise of even such flagship species as the tiger:

Species generally become rare before they become extinct—to feel no surprise at the rarity of a species and yet to marvel greatly when the species ceases to exist, is much the same as to feel no surprise at sickness, but, when the sick man dies, to wonder and to suspect that he dies by some deed of violence.

Darwin was dead right. Even a century and a half after he showed us the light, the vast majority of us still miss the point where the economy of nature is concerned. As for extinction, the issue exercises neither the minds of planners nor the middle class. Nowhere is this development myopia more evident than in the moldy, politically manipulated offices of the Ministry of Environment and Forests (MoEF) in New Delhi, where India’s wilderness is assassinated on a daily basis.

I bore witness to one such assassination attempt as I sat through an Expert Committee meeting in the MoEF. My heart pounded and a violent pulse thumped in my temple as an irate voice thundered: “It is a complete wasteland, not a blade of grass grows there and you want to stop my project for this?” The angry and self-righteous comment came from an upstart industrialist wanting to convert a dry thorn-scrub and mangrove habitat in Kutchh into a cement factory. His unspoken suggestion was that since there were no rain forests in the area he should be allowed to mine, dredge, and pillage a wilderness crafted by millions of

years of evolution to access limestone and lignite. Fragile topsoil would first be stripped, together with all the hardy plants and equally hardy soil organisms it supported. Highly endangered wildlife, including species on Schedule I of the Wildlife (Protection) Act, 1972, such as the Houbara bustard, dugong, and the delicate chinkara gazelle, were to be sacrificed ... to export cement to foreign shores. In the process, digging and dumping would also uproot thousands of mangrove plants, the breeding ground of the countless marine organisms that supported millions of fisher folk in the Indian Ocean. In less than thirty years, I knew, the rape would stop ... when the minerals were exhausted. Then the developers would seek newer, greener pastures.

It hardly matters which industrialist I allude to, or whether or not his project was cleared. The truth is that hundreds of such people have evolved very persuasive methods to convince senior officers and ministers to do their bidding. They far outnumber those seeking to defend India's wilds. And they are ably supported by some MoEF officials, such as one very powerful individual who ranted and raved about the manner in which environmentalists are "coming in the way of development" when I demanded that the Enron Thermal Plant at Dabhol, Maharashtra, be asked to install electrostatic precipitators and a flue-gas desulfurization plant. Eyes red with anger he hissed: "Our country's soils are deficient in sulfur so the sulfur that escapes from smoke stacks will actually benefit us. Why make them spend so much money?" He was under political pressure to pave the way for a clearance.

The dilemma of the Indian wilderness might better be understood by juxtaposing what the Andhra Pradesh government says,

Forests are the lifeline for the existence of life on earth. They not only provide natural habitat for the animals, insects, and birds; the rich forest wealth is a source of income and sustenance. Protect the forests and they protect you. Ravaged for short-term benefits, they spell doom for life on earth.

And what it does:

We seek approval of the Ministry of Environment and Forests ... to mine uranium from inside the Srisailem-Nagarjunasagar Tiger Reserve ... to build a nuclear reactor inside the protected forest ... to construct a four-lane highway through the Tiger Reserve.

Not surprisingly, the State of India's Forests Report, 1997, published by the Forest Survey of India (a part of the MoEF), reveals that between 1995 and 1997 Andhra Pradesh lost 3,822 kilometers of its forests. More than thirty tigers were poached in the same period. Such are the circumstances that delegates to the 6th World Wilderness Congress (WWC) must brood over as they discuss ways to protect the wilderness, and as they raise their voices to the "Call for a Sustainable Future."

The Shylock Factor

Not coincidentally, Andhra Pradesh (together with several other Indian states, including Maharashtra) is currently in an advanced stage of financial anemia brought about by its unholy flirtation with the World Bank, which has advanced monies for ecologically ill-advised projects such as roads in tiger habitats and eucalyptus monocultures on forestlands. Around the globe, of course, the role of the World

Bank in stripping biodiversity has been well documented through failed projects such as the roads through Amazonia, Brazil's Polonoreste Program, the Indonesian Transmigration Project, logging the Congo, and Botswana's illiterate livestock project.

The International Monetary Fund (IMF) and the World Bank were set up soon after World War II in Bretton Woods, United States, with the purpose of creating a new economic world order for the benefit of victor countries. The modus operandi of the IMF-World Bank combine is fairly straightforward. Using a carrot-and-stick policy for the South, they disburse funds to cash-starved nations such as India, Brazil, Indonesia, and the sub-Saharan countries (almost all of which are currently reeling under the effect of the IMF's "structural adjustments to ensure free trade and free enterprise"). This prompts the transfer of cheap raw materials and the opening up of new markets for the capital-rich, industrialized North. Essentially, the IMF loans money to countries facing foreign exchange shortages. The World Bank on the other hand loans money for what they call development projects. Following the principle of the piper calling the tune, moles ensconced in the headquarters of the World Bank (Washington, D.C.) have compromised the Indian government's policy-making ability.

Where is this likely to take us? Perhaps the Ethiopian famines could point the way. Ethiopia has lost more than 90 percent of its forests in the past five decades. As a consequence over a billion metric tons of topsoil have been washed away, resulting in 20,000 square kilometers of land being unable to sustain crops any longer. Within the next twenty-five years this land loss may reach a figure of 100,000 square kilometers. Food imports are now the only way to ensure that people in Ethiopia, Chad, Niger, and other such sub-Saharan countries are saved from famines.

Indian planners of today seem ignorant of the connection between degraded wildernesses and dwindling water and food supplies. India had escaped the fate of sub-Saharan Africa because the late Prime Minister Indira Gandhi refused to toe the World Bank line on forestry. She had placed a ban on clear felling of Indian forests, much to the dismay of the global power lords. In recent years new breeds of Indian bureaucrats, politicians, and businesspeople have been working assiduously to dilute this national position. They contest the view that our forests should be managed to protect wildlife, conserve water resources, and foster forest-tribal communities. They argue that development cannot be held back. But they do not address the question: "Development for whom and at whose cost?"

Reassured that the Indian treasury has guaranteed to pay back their money with interest, irrespective of the quality or feasibility of the project, the World Bank uses India's wildernesses as informal collateral against loans. Someone somewhere in the World Bank has probably calculated that while India's foreign debt is in the vicinity of U.S. \$100 billion, its timber "assets" alone are worth ten times that amount. Thus far, however, the protection lobby, bolstered by forest laws ushered in by Indira Gandhi, have prevented the World Bank and its partners from accessing large tracts of forests set aside for wildlife protection. But with help of the Food and Agriculture Organization (FAO), which hires Indian and foreign "experts" at high wages to virtually sign on the dotted line to make way for financially lucrative monocultures, the World Bank is whittling away at the protection resolve. The modus operandi is as follows: The FAO "advises" the Indian government (under the watchful eye of the World Bank) on how to "increase the productivity" of forests. All too often this involves stripping forests of their biodiversity and replacing mixed forests with monocultures of eucalyptus, tropical pine, poplar, teak, wattle, bamboo, etc. To protect these weak but commercially valuable species, fertilizers and pesticides are to be sprayed in forests that had thus far been spared such toxic "Green Revolution" techniques that have the power to alter the very course of evolution in the wilderness. Armed with this advice the World Bank encourages smaller institutions such as the United Nations Development Program (UNDP) to undertake pilot projects so that they have "proven" field trials to base future actions on.

Between them, the troika comprising the World Bank, FAO, and the UNDP has managed to hypnotize hundreds of forest officers in almost all the Indian states. Scores of bureaucrats are also currently trapped in the silken web of consultancies, trips to Washington, and junkets to exotic destinations where the fate of remote forest communities is decided. Disturbingly, of late, a large number of Indian nongovernmental organizations have joined this bandwagon, choosing to throw their reputation and independence to the winds as they too chase U.S. \$200 per day consultancies from those that consume the Indian wilderness. In the hands of such people, neither our wilderness nor our national water security is safe.

The “Tiger State” of Madhya Pradesh (so named because around 25 percent of India’s tigers are found in the state) is currently using World Bank funds to “strengthen” forest roads inside fragile national parks and sanctuaries. This normally means the roads are to be widened and straightened. Obviously, no local tribal community has any use for such roads, so one must presume they are being readied for the day when timber lobbies manage to have our forest laws diluted to allow large scale felling. This is bad news, particularly when the State of Forest Report, 1997 confirms that Madhya Pradesh lost 3,969 kilometers in a two-year span. Maharashtra, one of the victim states, which is also in the process of destroying its biodiversity at the behest of the World Bank, is poised to buy millions of kilograms of pesticides budgeted under the World Bank–financed Maharashtra Forestry Project. In Maharashtra observers suggest that the potential of future timber operations may have been the hidden motivation for the construction of tarred roads in the Melghat Tiger Reserve very recently. This is also probably why hundreds of concrete structures are being built inside distant forests—including sanctuaries and national parks such as the Kanha and Bandhavgadh Tiger Reserves. World Bank documents also disclose that pressure is being brought to bear on the central Indian government and several state governments to dilute forest laws to enable the free movement of timber (currently banned or severely restricted).

It is no one’s case that India should go back to living a Neanderthal existence. But all this presupposes something that present planners deny—that the wilderness has an inherent value. Be that as it may, even such planners must accept that despite spending crores of rupees since Independence—and destroying priceless natural assets such as rivers, forests, and soils—our dams, thermal plants, mines, and roads are all crumbling. And never in our history have we been as deeply in debt to the World Bank and the IMF as today. Yet more people live below the poverty line than ever before. In 1980 our total external debt amounted to U.S. \$20.582 million. By 1992 this had risen to U.S. \$76.983 million. Over the last few years, since the new economic policy was introduced, the debt figure has hovered around the U.S. \$1 billion mark.

By mislabeling loans as “aid” international loan sharks have lulled our economists into a somnambulant state as India bleeds. By some estimates as much as 15 percent of all the money borrowed by our government winds up in political and private coffers via a corruption trail that has now become virtually institutionalized. Ironically, not one of the major projects financed by the World Bank in India has ever shown a profit—the Singrauli Super Thermal Power Plant, the Subarnarekha Multipurpose Project, and the Farakka Barrage being prime examples of financial, social, and ecological mayhem. Yet more and more funds—for nonstarters such as the Dahanu Thermal Plant—continue to be borrowed. All these extravagant projects add to our foreign and national debt. As our debt burden rises, the number of children dying from malnutrition and disease increases. And of course, our wilderness vanishes.

Over 40 percent of the forests that clothed the Nepal and Indian Himalayas have been cut down over the past four decades. This is why floods in Ganges and Brahmaputra plains have increased in frequency and intensity. More than 3 billion metric tons of soil now flows with floodwaters into the Bay of Bengal. In the process Bangladesh, a victim of poor policies upstream, is devastated every single year. By some

estimates, when the Himalayan forests were intact a century ago major floods only took place on an average of once in forty or fifty years! It should concern the world, therefore, that China stands accused of plundering more than U.S. \$54 billion worth of timber from Tibet over the past three decades, taking the spoils of colonization to unheard of lengths. The stability of uplands is umbilically linked to the presence of trees, grasses, and shrubs. Such vegetation sponges rain, permitting it to percolate into aquifers that feed wells, lakes, and rivers. Roots also bind the soil, which is washed or blown away when deforestation takes place. Water shortage is the handmaiden of deforestation, ultimately lead to falling crop yields and chronic famine. Watershed destruction has also caused India's flood-prone areas to increase from 25 million hectares in the late 1960s to 59 million hectares in the 1980s, and nearly twice that in the 1990s.

Panthera Tigris: *Heart-Stopping Means toward an End*

Nothing can describe the rush of adrenaline that courses through the body upon seeing a tiger in the wild—quiet, confident, supercilious, perfect. But admiration cannot be the motivation to save a species. Using animals, nature “plants” forests, grasslands, and wetlands—the crucibles of human civilization and survival. An elephant, for instance, eats fruit in one part of the jungle and drops seeds elsewhere. Each day these mammoths thus plant fruit trees, which their progeny will use. Birds and squirrels perform a similar “indiscriminate” planting function. Animals, other than humans, do not possess the technology to destroy nature. And in nature, nothing goes to waste. Thanks to a recycling system so perfect that the human mind cannot even comprehend it, every animal serves to enhance the fertility of the soil upon which all life, including that of *Homo sapiens*, is dependent.

Sadly, there is probably no better exemplar to illustrate the wasting of India's wilderness than the imminent demise of *Panthera tigris*. Ironically, the largest single financial input into tiger habitats anywhere in the world comes from the offices of the World Bank. This money has been unthinkingly welcomed by many conservationists in India and overseas. Their celebrations are uncalled for. For every dollar that the World Bank pours into what it terms as “biodiversity enhancement,” it allocates at least another U.S. \$100 to destroy the natural ecosystems of India. The example of Palamau Tiger Reserve is particularly interesting. Here the World Bank has channeled a relatively large amount of money for ecodevelopment, which it hopes will enhance the biodiversity of the forest, while simultaneously financing a multimillion dollar dam that will drown part of the sanctum sanctorum of the reserve!

Human incursion into tiger territory has reached unbelievable proportions. Mines operate with impunity in tiger forests including Sariska, Ranthambhor, Bhadra, Gir, Madhav, Palamau, Balphakram, and Simlipal. Mega-dams threaten Palamau and Indravati. “Five star” tourism is being promoted in Ranthambhor, Nagarhole, Bandhavgarh, Corbett, and Periyar. Timber extraction has been increased in and around Melghat and Srisailam and, for that matter, around almost every known tiger habitat in India. Insurgency is destabilizing the Manas, Palamau, Valmiki, and Indravati Tiger Reserves. An International Steamer Channel Route threatens the mangrove ecosystem of the Sundarbans Tiger Reserve with 250,000 cubic meters of capital and 100,000 cubic meters of maintenance dredging. Deforestation has led to devastating flooding in Kaziranga, which is now awash in pesticides washed down from surrounding tea estates. Hundreds of licenses have been issued for commercial fishing in the Pench Tiger Reserve.

On top of all this, a sum of U.S. \$90 million has been allocated for a rural development project that is mislabeled Biodiversity Conservation Through Ecodevelopment. This GEF project seeks to introduce economic development into the surrounds of tiger reserves, among other protected areas, and thus seeks to

alter the very nature of local communities. This project was predictably tagged onto the World Bank Forestry Projects, using the same consultants, executing agencies, and strategies. Project Tiger steering committee members vociferously opposed this step, advising the government to proceed with caution and at least undertake an environment impact analysis before implementing the project. But the MoEF went ahead, preferring to follow the advice of sociologists from the Indian Institute of Public Administration, some of whom had never stepped into a tiger reserve until they were called upon to work as consultants to the project.

Current strategies to save the tiger and other wildlife in India are seriously flawed. Despite the huge amounts being poured into tiger conservation in India, the pace at which the tiger and other wild animals are dying has accelerated in recent times. Large urban conservation groups and field biologist-driven tiger recovery programs have missed the forest for the trees. Almost all their attention and resources have been lavished on saving the tiger from poachers—and villagers, whose fuel needs and livestock they blame for degrading wildlife habitats. Probably less than 5 percent of all funds allotted to saving the tiger are being used to defend the cat from its most serious challenge—the appropriation of its jungle home by commerce. Even more ominously, the very agency responsible for saving the tiger, the MoEF, has become a virtual rubber stamp for politicians of all descriptions whose industrial ambitions conspire to destroy tiger habitats. This one government agency is responsible for funding almost all field-biology research in India. Predictably, there are few voices courageous enough to oppose industrial projects endorsed by either the minister for environment and forests or the prime minister's office. In such circumstances, on Friday, May 10, 1996, Justices J. S. Verma and B. N. Kirpal of the Supreme Court observed (in response to a public interest petition filed by the Research Foundation for Science) that it was better to have no law at all than have laws that were not followed. The judges threatened to record a finding of “breakdown of government machinery” and noted that the Central Ministry of Environment was encouraging laws to be broken rather than followed. Acutely aware of the risk of such public interest litigation, senior MoEF officers have been dissuaded from revealing lists of projects seeking environmental clearances close to our sanctuaries and national parks. Unless radical policy changes are introduced to prevent this betrayal, the extinction of the tiger and the destruction of its wilderness is a foregone conclusion.

The Wilderness as a Repository of Original Forest Cultures

In the post-Independence era latter-day colonialists in urban India saw no irony in unashamedly using black legislation crafted by the British—The Land Acquisition and Official Secrets Acts—to usurp tribal lands. The direct result of this land grab for minerals, timber, and land saw the annihilation of over 95 percent of the tribal cultures of India. Tragically, the displacement of tribal communities and the looting of their lands, forests, rivers, and ancestral properties continues unabated. Today, almost the only place where forest communities are still able to lead their traditional lifestyles is in and around the over 500 protected forests set aside for wildlife protection. Though the Wildlife (Protection) Act, 1972 and the Forest (Conservation) Act, 1980 also have their genesis in colonial legislation (as do all other Indian laws), they effectively kept most market forces at bay. Here nature was allowed to be . . . nature.

Despite the fact that wildlife laws abrogated many legitimate rights of tribal people, these laws also prevented the state from pillaging the forests. And, since the tribal communities knew such forests better than any forest department, using hidden forest trails and ancient technologies for survival, they continued to access resources such as barks, tubers, vines and creepers, crabs, fish, and small game. In such

pockets, therefore, a very small percentage of the total population of scheduled tribes (above 60 million), such as the Adis, Bhils, Baigas, Bhumias, Chenchus, Garos, Korku, Mannans, Maria Gonds, Nagas, Sanrals, and Warlis, are still able to hold on to some of their ancient traditions. Outside the protected forests, however, millions belonging to precisely the same tribal cultures have been converted into bonded labor, urban migrants, or destitute rural people. Significantly, nor one human rights or social activist group was able to prevent this tragedy, and yet we see vast chasms between “wildlifers” and those who champion the rights of people. Quite apart from the misguided notions of development that were thrust upon them, the forests upon which such people were dependent were simply extirpated. But a series of denotifications threaten to extinguish even these relic pockets.

The most tragic example of such policies was the denotification of one-third of the Melghat Tiger Reserve. The larger Melghat Region has witnessed the death from malnutrition of over 4,000 Korku children in a five-year period spanning 1994 through 1998. But in the same period, inside the reserve, the infant mortality rate remained relatively unaffected by drought and disease. What makes such deaths even more hurtful is the fact that the authorities had been warned well in advance. This is what I wrote about Melghat in the *Times of India* in October 1993:

It is sad to see that politicians are trying to turn the tragedy of starvation deaths in Vidharba to their advantage by asking for the denotification of the Melghat Tiger Reserve. Here is what will follow the denotification: tar roads will quickly replace the dirt tracks, two and three star hotels, luxury farm houses, and other such distractions for the rich will be built. A long-standing proposal to construct a major dam across the Tapi River will be pushed through, displacing still more villagers and usurping the forest which feed their children.

Disturbed by the continuing malnutrition-related deaths of Korku children in the Melghat Region, Sheela Barse, a well-known human rights activists filed a petition in the Nagpur High Court seeking information about and redress for Korku communities reeling under the onslaught of hunger and illness. It was revealed that 1,075 children had died in the year 1996 alone. Perhaps around 60,000 people live in the fifty-six villages that fall within the Melghat Tiger Reserve, where attempts to forcefully displace twenty-two villages by the state government were successfully thwarted by the steering committee of Project Tiger. Sheela Barse confirmed to me in personal discussions (ratified by Mr. R. C. Sinha, a senior government officer who had been asked to investigate the malnutrition incidents by the Maharashtra government), that the death of infants had taken place outside the tiger reserve in Dharni and Chikaldhara, where the forests have already been degraded and urbanization has replaced the forest way of life. Inside the tiger reserve, however, Korkus and other forest dwellers were able to continue accessing fruit, tubers, medicinal plants, fiber, and barks. These lifesaving resources, combined with the knowledge of how to use them—passed down over the ages—saved their children. In fact, through the worst droughts of the past fifty years, never have any of the villages inside the Melghat Tiger Reserve needed water supplies by tankers (which was a necessity outside, where the forests were degraded). Surprisingly, however, the Maharashtra government chose to spend over U.S. \$2 million to build tarred roads and deliver electricity to Korku villages inside the Melghat Tiger Reserve. In the name of preventing malnutrition, the infrastructure for the exploitation of the forest and its tribal communities has now been laid.

Given such ruthless exploitation, it is little wonder that the seeds of separatism and violence have sprouted through the length and breadth of our once peaceful land. Indeed, those who fear the dismemberment of India should consider whether our country has not already been split in two—rich India and poor India. Only self-inflicted myopia prevents us from recognizing this tragic reality.

But India no longer controls its development destiny. This now is in the hands of global players such as the World Bank. It is imperative therefore in an age of globalization that the world community, as represented by those who support the objectives of the WWC examines its own role in the destruction of India's wilds. The imperative of paying back and servicing ongoing debts is preventing India from focusing on issues concerning the security, welfare, and upkeep of our people. And the wildernesses we wish to save are being sacrificed every day under pressure from bilateral and multilateral lending agencies seeking to have old loans repaid and new ones guaranteed. Thus are the gifts of nature—fertile soil, fresh water, fish, grass, wild fruit, and fuelwood—denied to the people who once owned the commons.

Development as Though the Wilderness Mattered

In this dismal scenario there is one ray of hope. Nature is a self-repairing machine. Left to its own devices, rivers will purify themselves, forests will regenerate, the impact of floods will be tempered, coastal waters and estuaries will increase their fish yield, and wetlands will protect us from droughts. For such miracles to unfold, all the wilderness asks of us is that we use it without abusing it. As I see it, there can be no better way to protect the wilderness than to demand that ailing assets fabricated from the blood and sacrifice of millions are made to perform. This line of investigation will lead us toward alternatives that should become our national purpose over the next decade or two—to improve our economic and ecological infrastructure. Here is a three-point beginning:

1. Acknowledge the problem:

- Every single one of India's more than 1,750 large dams is dying young. Not one produces as much power or irrigates as large a command area as its promoters had promised. Our canal systems are leaking and waterlogging, and soil salinity conspires to rob us of our food security. All this because virtually no money was invested in maintenance and upkeep.
- The plant load factors of the vast bulk of our thermal plants is abysmal and our transmission systems are literally falling apart. Again, maintenance has been dismal and public accountability even less.
- The nuclear power sector has sucked more from the nation than it has delivered, and its wastes are a septic focus of ill health. Public criticism of the nuclear program was stifled on grounds of national security.
- Floods, droughts, and landslides take a greater toll on our people each year, and the per capita availability of water is less today than it was fifty years ago. The connections between deforestation, floods, and drought escaped our planners.
- More than 90 percent of our people have no access to safe drinking water, and the few sources that are pure are likely to be poisoned by scores of new factories being set up. Overextraction of water and dumping of toxins threatens to permanently damage our groundwater. Apart from generating wastes internally, India is the target of toxic exports from countries such as the United States, the United Kingdom, Germany, and Australia.

- Our coastal areas have been ruined by misguided attempts to industrialize regions that were always water-poor. The fishing communities that depend on coastal ecosystems are still not part of the decision-making process.
- Not one city has adequate medical or residential facilities, yet we continue to displace millions each year and thus push them toward our already overstressed urban slums where demolitions are the order of the day.
- The surfaces of our roads and highways resemble minefields because huge chunks of the budget are being pumped into new roads and there is little left to maintain the existing networks.
- Unless we acknowledge that our past investments on infrastructure development have let the nation down and that we must incorporate radical, ecologically sustainable strategies for the future, we are destined to regress into a “business as usual” mode from which there is unlikely to be any escape. New dams, mines, thermal plants, expressways, chemical complexes, and other such urban fantasies of development serve to impoverish the majority environmentally and socially, even as they enrich an already pampered minority.

2. *Invest in maintenance and efficiency:*

- Every rupee we spend on efficiency today will yield us greater returns than a rupee invested in creating new infrastructure. We need massive investments in terms of both labor and finance to desilt our water reservoirs, repair our tattered watersheds, reline our canal systems, resurface our roads, repair and improve our power transmission lines, retrofit turbines, replace inefficient pump-sets and motors, and detoxify our soils. There is a name for this strategy, which involves employing millions of people in the rural hinterland (thus reducing the migration of people to urban centers). It’s called preventive maintenance, and almost all households in India practice it to perfection. This is why our people are among the most environmentally friendly in the world. If our government was able to do imbibe simple attitudes that virtually every housewife possesses, in a span of one decade India could become a world power in terms of ecological security, food self-sufficiency, and financial stability. One proviso, of course, would be our recognition of the futility of replacing the infrastructures of survival (forests, grasslands, lakes, rivers, coastlines, and wetlands) with the infrastructures of commerce (dams, mines, roads, and factories). The moment we stop destroying our wildernesses, the process of renewal will begin.

3. *Go back to the future:*

- In the crucible of India’s cultures lie solutions to the problems of tomorrow. Rather than fall for the line that is being sold to us by the Organization for Economic Cooperation and Development countries (that we can and should consume more and produce more to bolster the economy), we need to make attitudinal changes to recognize that the purpose of development for ordinary people is not growth, but stasis and security. We need to adopt and utilize, not replace, the ancient traditions and the wisdom of tribal communities. But this will only be born from a sense of security that can be derived when we flow with the tide of nature, instead of against it. No organism or system can keep growing continually. There is a name for such a phenomenon. It is called cancer.

Should India Have Wilderness Legislation?

S. M. Satheesan and Samar Singh

When one thinks of wilderness, what comes to mind may be a valley of flowers, with the lullaby of streams flowing, the cacophony of birds in fruit-bearing trees, colorful butterflies, and bees on vines and bushes. Or it may be snow-clad mountains with ice falls and glaciers. Or else a beautiful sunrise or sunset on a sea beach or a riverbank. It may be also the captivating grasslands of tundra or ice floes of the Arctic. In whatever form wilderness is bestowed on us, it is our home where we grew up, where we learned to tackle our problems in life, and wilderness will teach us how to survive in the uncertain future too.

Wilderness: A Boon to Humankind

The so-called primitive people of the bygone era lived in harmony with wilderness and led a successful and happy life. The “civilized” people of the present century struggle more than the “uncivilized” people of yesteryear and the tribal and aboriginal people living today in different parts of the world. Converting time into money to achieve “progress,” modern humans remain unhappy. We should not invite tribal and aboriginal people into our path of technical progress, encouraging them to abandon their customs and lifestyle, and dragging them into a world of tension, uncertainty, fear, competition, and perpetual gloom.

In India, wilderness has inspired poets, artists, spiritual reformers (including *rishis*, *munis*, and *yogis*), travelers, educators, and scientists and has been accredited for their creative contributions. Wilderness is also utilized as a therapy for people afflicted with delinquency, personal tragedy, or substance abuse, and for personal growth, restoration of the tired, nerve-shaken, and overcivilized.

This world of material values has drifted much from real-life values. The material values of the political and business world lead to insecurity and hunger for power, position, and money, and result in increased aggression, murder, criminality, depression, loneliness, and suicide. Only wilderness can teach us the good values of life such as love, hope, courage, humility, and sympathy. Wilderness can give us solace in troubled times. It is the panacea for all the ills of humankind.

What Is a Wilderness Area or Wildland?

Wilderness represents unspoiled nature. Even deserts, which appear to be lifeless expanses of sand, empty except for the occasional nomad, or frightening great sand seas ready to engulf more drylands, support complex ecosystems. Desert landscapes have spectacular natural beauty. The warm deserts of the Thar, or Great Indian Desert, covering 200,000 square kilometers, is well known for its beautiful sand dunes, some of which can reach a height of 150 meters. The cold desert of Ladak is equally interesting and has a different type of ecosystem. Physical and behavioral adaptations of animals and plants in deserts teach us how to tide over in extremes of climate and, hence, arid wilderness is a useful ecosystem. Some important food crops come originally from areas that scientists would define as deserts or desert margins.

The wildlands in India occur as virgin landmasses in the mountain ranges (such as the Himalayas, Aravallis, Western Ghats, Eastern Ghats, and Satpuras), hills and hillocks, plateaus, valleys (such as Kashmir Valley and the Valley of Flowers), grasslands, oceans and sea coasts, rivers, rivulets and riverbanks, large ponds, lakes, backwaters (such as in Kerala), mangroves (freshwater and marine), waterfalls, deserts (such as Thar and Ladak), sacred groves, and temple groves.

Why Protect Wilderness Areas or Wildlands?

Besides the philosophical, spiritual, and cultural values, wilderness areas or wildlands have natural, ecological, and scientific values vital for the plants and animals that live there. Wilderness areas protect watersheds upon which many urban populations and rural communities depend for pure water, they serve as critical habitats for animals threatened by extinction, and they improve air quality because of the filtering actions of green plants. Wilderness reduces greenhouse effects and depletion of the ozone layer, it maintains gene pools to provide biodiversity, and it is an indicator of harmful environmental changes because wilderness is sensitive to disturbances such as pollution.

The concept of wilderness is not incorporated in the main text of the Bio-Diversity Convention; instead, it is relegated to Annex I. The 1973 World Conservation Union (IUCN) report from the Commission on National Parks and Protected Areas (CNPPA) mentions ten categories of protected areas. The criteria used for selecting these areas were approved by the Commission at the eleventh session of the General Assembly of the IUCN held in Banff, Canada, in September 1972.

Using this classification, areas in category I(b) are Nature Reserve wilderness areas, in which large areas of unmodified lands and/or seas retain their natural characters without permanent or significant habitation and are protected and managed in order to preserve their natural conditions. This subcategory was introduced following the IUCN General Assembly Resolution (16/34) on protection of Wilderness Resources and Values adopted in the 1984 General Assembly in Madrid, Spain. Wilderness areas in category I(a) are Strict Nature Reserve areas and are closed to all forms of activities, including tourism. Sunderbans National Park, established in 1984, and located in West Bengal, is included in this category.

After the fourth World Wilderness Congress on National Parks and Protected Areas, the World Commission on Protected Areas (formerly the CNPPA) defined a protected area as an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity and of natural and associated cultural resources and managed through legal or other effective means. According to the 1994 International System, a protected area is categorized as either a:

- I. (a) Strict Nature Reserve or (b) Wilderness Area managed mainly for science or wilderness protection;
- II. National Park managed mainly for ecosystem conservation and recreation;
- III. Natural Monument managed mainly for conservation of specific features;
- IV. Habitat/Species Management Area managed mainly for conservation through management intervention;
- V. Protected Landscape/Seascape managed mainly for landscape/seascape conservation and recreation; or
- VI. Management Resource Protected Area managed mainly for the sustainable use of natural ecosystems.

According to category I, areas of land and/or sea possessing some outstanding or representative ecosystems and/or geological or physiological features and/or species, are available primarily for scientific research and/or environmental monitoring; or, they are large areas of unmodified or slightly modified land and/or sea that retain their natural characters without permanent or significant habitation and are protected and managed so as to preserve their natural conditions. Thus, wilderness protection is a primary objective in I(b), a secondary objective in I(a), II, and V, and a potentially applicable objective in III and IV, and is not applicable in VI, according to the matrix of management objectives and IUCN Protected Area Management categories. The protected area classification of the IUCN includes wilderness categories based on management criteria. However, in this system wilderness categories can only be applied to areas that have already been designated as protected areas. Hence, there is a need to define, identify, and map wilderness areas for future protection and management.

Need for Wilderness Legislation

In India, the Wildlife Protection Act and Indian Forest Act allow various levels of protection. Protected areas are either national parks, wildlife sanctuaries, game reserves, closed areas, reserve forests, or protected forests. In the Indian context, a wildlife sanctuary is an area of ecological, faunal, floral, geomorphological, natural, or zoological significance declared for the purpose of protecting, propagating, or developing wildlife or its environment. The intention is that the conservation of biological values (species or communities) has priority over other forces of resource utilization. Such resources may only be exploited if such activity does not detract from conservation objectives. A national park is a similar area within or outside a sanctuary, but no consumption of land or natural resources is permitted except that necessary for management to achieve conservation objectives.

Indian protected areas do not conform to the IUCN definition, which describes a national park as an inviolate natural system that has not been materially altered by human exploitation and occupation and is hence devoid of human settlement. Many of the protected areas in India are, in fact, functionally what the IUCN refers to as Multiple Use Areas. Rodgers and Panwar said that the terms "Biosphere Reserves," "Nature Reserves," and "Sacred Forests" have no legal status under Indian law. In recent years, a Biosphere Reserve Program was started by the Ministry of Environment and Forests to conserve ecological diversity and protect representative ecosystems. Out of the fourteen potential sites identified in 1979 by the Core Advisory Group of the Indian National Man and Biosphere Reserve committee for setting up biosphere reserves, eight have been set up so far.

Biosphere reserves are larger planning areas that are integrated ecosystems containing legally protected core zones (e.g., national parks and wildlife sanctuaries) within a framework of human settlement and resource exploitation areas. For example, game and wetland reserves that were formerly primarily used for sport hunting are still being used as hunting areas in Jammu and Kashmir. One can also find wilderness areas in the newly proposed protected areas or in protected areas identified by researchers and government authorities. For example, Ezhimala in Cannanore District and Kumarakom on Vembanad Creek in Kottayam District, both in Kerala State, were proposed as wildlife sanctuaries by W. A. Rodgers and H. S. Panwar. For long-term conservation, however, legislation is required to protect all such wilderness areas inside or outside biosphere reserves, game reserves, and sacred forest groves.

Wilderness is a finite, nonrenewable, nonsustainable, irreversible, and common resource area. Hence, it has to be managed in a careful proactive, rather than reactive, manner. A wildland that

may be important biologically, genetically, or otherwise, but is fragile and cannot withstand continued human pressure, needs protection through legal status to render its long-term viability.

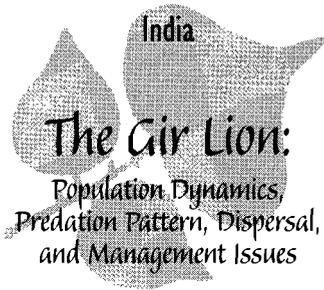
There is an urgent need to develop objective criteria to identify and map all wilderness areas not included in the already designated protected areas. Currently, there are eighty-three national parks and 447 wildlife sanctuaries, covering an area of 150,000 square kilometers, which is approximately 4.5 percent of the landmass of India, according to the 1996–1997 Annual Report of the Ministry of Environment and Forests.

Management criteria for wilderness, including the unique cultural values of areas to indigenous people, need to be developed on a national basis. According to the Resolutions of the 5th World Wilderness Congress held in Norway in 1993, a small working group needs to be established to define objectives for and identify wilderness areas. Such objectives might include relative naturalness of the land cover, remoteness, size, and human population density. Governmental and nongovernmental organizations should be encouraged to map wilderness nationwide, and an analysis of status, distribution, and biogeographical region representations may be needed to support efforts for wilderness protection. Governmental and nongovernmental funding agencies and participating institutions should be contacted for financial support, and the working group needs to report on its progress made toward defining and mapping wilderness areas.

In preparing management criteria, the following topics should be considered:

- Sustainable use of resources by indigenous people
- Rights of indigenous people to safeguard the integrity of the wilderness area
- National action to protect wilderness areas from climate change, pollution, radioactivity, tourists, trekkers, adventurers, sailors, etc.
- Impact of human population growth/explosion
- Use of environmental impact assessment studies on threats to wildlands from industries such as mining and aquaculture and threats to biodiversity from human activities
- Environmental prizes/rewards to be given
- Special environmental days to educate, celebrate, and raise support funds
- Creation of a youth network
- Creation of awareness programs on wilderness conservation through environmental protection, habitat restoration, and sustainable development projects or through cultural and philosophical activities

Wilderness satisfies people in multiple ways; it is a powerful force because of the versatility of interests it attracts and displays. One thing is certain: Civilization is impossible without wilderness, and protection of wildlands is of great importance in the health and survival of the planet. However, without proper legislation, wilderness protection is next to impossible.



H. S. Singh

The Gir

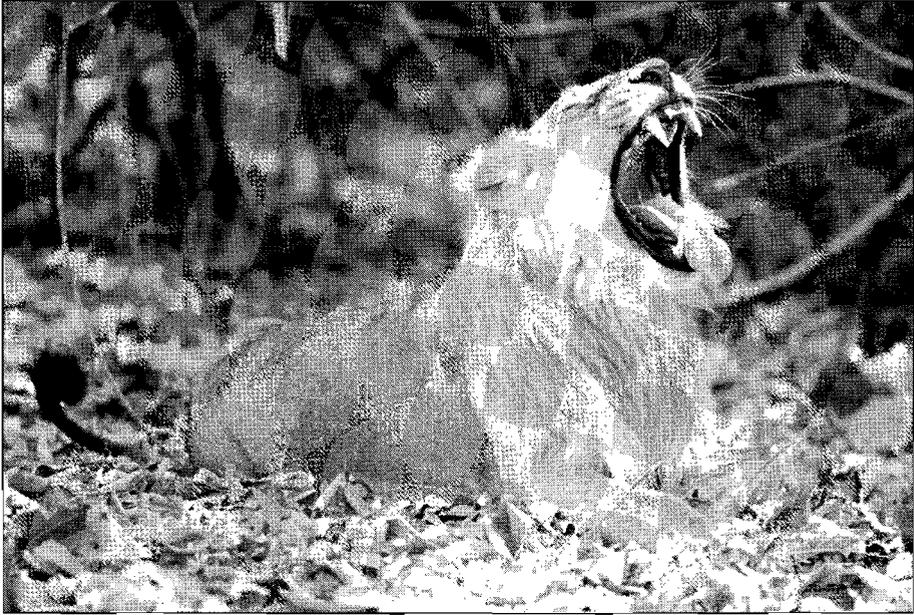
The Gir in the Saurashtra region of Gujarat State, India, has long attracted the attention of conservationists throughout the world because it holds the last remnant population of the Asiatic lion, *Panthera leo persica*. The Gir is further valued by ecologists for having the single largest tract of compact forest in a semi-arid zone in the western part of the country. In the early part of this century, the Gir was connected with the hill forests of Girnar, Mitiyala, Barda, Alech, Dhank, and Chorwad by corridors of rough, semiwooded forests, grassland, and sparsely populated villages, which enabled the lions to move freely in the region, but they are now separated due to changes in land use patterns in the corridors.

During a study of the threatened fauna of Southeast Asia, it was concluded that the Gir lion was in serious jeopardy, both from direct killing and from deterioration of the forest by excessive livestock pressure (Talbot 1960). To protect the Asiatic lion, Gujarat State established the Gir Sanctuary in 1965. A study by Joslin (1984) revealed that the Gir lion displayed an overwhelming evidence of accelerated degradation and stated that if nothing were done to arrest the rate of decline in the number of surviving lions, the species would be extinct within two decades.

The Gir Lion Wildlife Sanctuary Project was established in 1972. The sanctuary was fenced by a 380-kilometer stone wall, with 289 *maldhari* families (forest settlement households) out of 845 settled within the sanctuary. The others were forced to settle outside the sanctuary. This has resulted in an overall improvement for the Gir lion, including a population increase. At present, the sanctuary area of 1,412 square kilometers, with a national park area of 259 square kilometers in the central part of the sanctuary, is well protected.

The most important aspect of the area is that it has become a stable ecosystem with tremendous regenerating and self-sustaining qualities due to its rich biodiversity. It harbors more than 450 species of recorded flowering plants, 36 species of mammals, 35 species of reptiles, 6 species of amphibians, and more than 310 species of birds (Singh 1995), along with a gamut of microflora and microfauna. Another important feature of the Gir Sanctuary is that it supports the highest concentration of top-of-the-food-chain carnivores, lions and leopards (more than 550), and the single largest population of marsh crocodile (more than 700) in the country (Forest Department 1996).

The Gir Sanctuary is also the catchment area for seven major rivers and four medium-sized irrigation dams that sustain economic prosperity in this drought-prone region. In addition, it is also known as the mother of cultural and religious evolution in Saurashtra.



An adult male Gir Lion. PHOTO BY MANOJ DHOLAKIA.

Distribution of the Lion in India

In the time of Lord Buddha (600 B.C.) lions roamed over the entire Indo-Gangetic Plain, extending from Sind in the west to Bengal in the east, and from the Himalayan foothills in the north to the Narmada River in the south. Absence of the lion from the region lying south of the Narmada indicates that India was not its original home. The lion entered India from Persia through the northwest passes at least 6,000 years ago (Rashid 1992).

Outside Gujarat, lions disappeared from other parts of India around 1840. This big cat disappeared from everywhere in Gujarat, except Saurashtra, by 1880. Lions deserted the Barda Hills, Alech Hills, and other areas of Saurashtra, except Gir and Girnar, toward the latter half of the nineteenth century. The chief forest officer of Junagadh State reported in 1913 that there were not more than twenty lions in the Gir. Probably this low number was reported to save the Gir lion from hunting, but it is a fact beyond doubt that the lion population was very low at that time.

By 1950 the lions were found only in Gir and Girnar. Population estimates at different times were 100 in 1920, 287 in 1936, 220 in 1950, 290 in 1955, 285 in 1963, 177 in 1968, 180 in 1974, 205 in 1979, 239 in 1985, 284 in 1990, and 304 in 1995 (see table 1). In the twentieth century the Gir lion experienced several bad periods. The last population decline was reported between 1955 and 1970 when depletion of wildlife continued with degradation of habitat. Habitat and wildlife started recovering with the establishment of the Gir Lion Wildlife Sanctuary. Recent records indicate that a reverse trend of movement began when Gir lions started reestablishing themselves in their former territories.

Wildlife Population

During the two weeks Talbot (1955) visited Gir, he saw thousands of buffalo, cattle, and goats desperately competing for food. He saw little wildlife—only three spotted deer, two small herds of bluebull and

TABLE 1: Growth of Wildlife Population in the Gir.

<i>Year</i>	<i>Lion</i>	<i>Leopard</i>	<i>Hyena</i>	<i>Wild Ungulates</i>	<i>Ungulates per Lion</i>
1974	180	142	63	9,640	54
1979	205	161	84	14,960	73
1985	239	201	192	16,910	83
1990	284	212	97	31,490	111
1995	304	268	137	38,220	126

TABLE 2: Distribution of Lion Population in Different Areas (Census May 1995).

<i>Sr. No.</i>	<i>Areal/Zone</i>	<i>Male</i>	<i>Female</i>	<i>Cub</i>	<i>Total</i>
1	Gir Sanctuary and National Park	82	104	59	245
2	Peripheral forests	10	5	2	17
3	Outside Gir (Satellite population)	20	12	10	42
	<i>Total</i>	<i>112</i>	<i>121</i>	<i>71</i>	<i>304</i>

chinkara, and one wild boat. Joslin estimated there were about 5,600 wild ungulates in Gir in 1968. The following year, Berwick estimated nearly the same number by road counts (Berwick and Jordan 1971). A wildlife census carried out in 1974 estimated wild ungulate populations of spotted deer, sambar, bluebull, four-horned antelope, chinkara, blackbuck, and wild boat to be 9,650. Subsequently, ungulate populations grew above 38,000 in 1995 at the rate of more than 14 percent per year. Khan (1990) estimated a still higher figure of 43,000, with spotted deer numbering approximately 38,000.

The Gir habitat has also improved significantly, which has resulted in an increase in the availability of food and water. Six consecutive censuses have been conducted at intervals of five years since declaration of the sanctuary. In spite of the increase in the lion population, availability of wild ungulates per lion has increased from fifty-four in 1974 to more than 126 in 1995 (see table 1).

Predation Pattern

Large-scale predation on domestic livestock by lions was reported when the Gir Lion Wildlife Sanctuary was first established. Killing of livestock in and around the sanctuary was regularly recorded, which indicates that the lion's dependency on domestic livestock was very high. Analysis of lion scat collected

in 1971 and 1972 throughout the sanctuary showed that about 75 percent of the lion's food was from domestic livestock, reflecting its great availability and the shortage of wild ungulates (Joslin 1973). As per estimates made in 1971, approximately 44,000 heads of domestic livestock, including illegal entrants, and 5,600 wild ungulates lived and grazed within the sanctuary. The situation is completely changed due to recovery of habitat, reduction in livestock population in the sanctuary, and a four-fold increase in the wild ungulate population from 1974 to 1995 (Anonymous 1995).

The last thirty years have witnessed a complete reversal in the predation pattern of lions in Gir as their dependency on livestock in the sanctuary has been reduced. Sinha (1987) reported that 52 percent of the scat he analyzed contained wild prey. As per a study by the Wildlife Institute of India in Dehradun, wildlife constitutes 60 to 65 percent of the lion's food, and the remaining 35 to 40 percent comes from livestock (Chellam 1990).

Another study conducted recently reveals that 63.2 percent of total scats ($n=332$) contained the hair of wild animals, and 36.8 percent contained the hair of livestock (Dharaiya et al. 1998). As per this study, spotted deer (23.2%), buffalo (16.9%), cow (15.7%), sambar (11.8%), bluebull (11.4%), and wild boar (7.8%) are the major food sources of Asiatic lions in Gir. The shift in predation pattern is due to changes in the availability of prey species within the sanctuary and national park. However, approximately 20 percent of the lions outside the protected areas still derive a major share of their food from domestic livestock (Singh and Kamboj 1995).

Average figures for the last five years have revealed that 1,910 domestic animals, mainly buffalo and cow, have been killed each year. The state government compensates owners for livestock killed by carnivores. A proper system has evolved during the last two decades and all kills are recorded in the registers, which are maintained in range and division offices. The average number of livestock kills within the sanctuary remains constant at about forty livestock per month, with a marginal increase of 15 percent in the beginning of summer (February and March), which is the peak littering season of the Gir lion (Singh and Kamboj 1995).

Maximum predation of lion on livestock belonging to peripheral villages was observed during the rainy season (June and July). This may be due to the fact that during the rainy season, the lion prefers to live in the open areas along the periphery of the sanctuary to avoid the pestering flies, insects, and dense vegetation within the sanctuary. Also, there is maximum movement of domestic livestock for grazing and agricultural activities in surrounding areas during the rainy season. Probability of lion-livestock encounters increases during this season, resulting in increased killing of livestock in the peripheral villages. Average figures from 1986 to 1995 indicate that domestic livestock kills inside the sanctuary are reduced by more than 10 percent, whereas it increases by approximately 20 percent outside the sanctuary during the rainy season. A recent study reveals that the predation on livestock varies from 28.6 percent in winter and summer to 46.8 percent in the monsoon season (Dharaiya et al. 1998).

Predation patterns of lions vary remarkably in different parts of the sanctuary. Although the area of East Gir is only half of the area of West Gir, the resident domestic livestock population is almost double. The availability of domestic livestock per lion in East Gir is almost four times that of West Gir. On the other hand, population of wild ungulates in East Gir is far lower than that of West Gir. On average, twelve livestock per lion are killed in East Gir, compared to 8.6 livestock per lion in West Gir. Great variations in distribution of ungulates and livestock population densities have caused major changes in predation patterns because lion predation on livestock in East Gir is twice that of West Gir.



A group of sub adult lions, finding a shortage of space in Gir, search for a new home. PHOTO BY MR BHUSHAN POMDYA.

Group Structure

Lions live in fission-fusion social units (prides) that allow pride members to form subgroups of different sizes (Packer et al. 1989). They not only engage in group foraging but also defend their young and territories as a group. Availability and distribution of prey species, predation patterns of lions, and population structures normally affect grouping patterns.

Sizes of groups recorded in the Gir were large in the past, but a group above a dozen members is rarely seen now. Plenty of resident livestock populations and bait offerings in some areas in the past may be two of the reasons for these large groupings.

During the last day of the census in May 1995, 304 lions were located at ninety-four sites, compared to 289 lions at fifty-nine locations in 1990. Average group size was 4.8 (ranging from one to twenty-eight) in 1990 and 3.2 (ranging from one to fifteen) in 1995. The majority of adult males were seen in groups of one or two. Mixed groups, composed mainly of females and cubs, had an average size of 11.3 in 1990 and 6.3 in 1995. In this observation, live baits may have caused some artificial groupings at a few sites, but such groupings were mostly restricted to animals that normally share food at kills.

Dispersal and Migration

In 1955 half the lion population counted was found outside the present boundary of the sanctuary (Joslin 1984). Talbot (1956) and Joslin (1971) observed that lion population was declining due to loss of habitat and killings. Evidence indicates that the lions disappeared from neighboring forests outside the Gir from 1950 through 1965.

With continuous improvement of habitats in the Gir during the last twenty-five years, the lion and other wildlife populations grew gradually. Before the 1990 census, lions were occasional visitors to Girnar, Mitiyala, and the coastal forests, but they also started visiting and staying in neighboring forests during this decade. Seventeen lions were recorded outside the Gir in 1990, which increased to forty-two in 1995 (Forest Department 1996). The population of this great cat has remained almost at the same level in and around the sanctuary and national park during the two censuses (267 in 1990 and 262 in 1995). Infighting among male lions has been observed and has increased during the recent past. This may be due to the saturation of the lion population to its carrying capacity in the area. An analysis of the results of two censuses indicates that the entire increase in the lion population is in the area outside the Gir.

In 1995 forty-two lions were counted, thirteen in Girnar, three in Mitiyala, and twenty-six in the Coastal Zone. Some of them are part of a floating population, but many of them opted to make their home in these places permanently. It was also observed that the young adults normally constituted the majority among the dispersed population. Records of the Forest Department of Wildlife indicate that the coastal forest area and Girnar have become a littering ground for the lions.

The situation is changing gradually as this great cat has started capturing its lost territories. At present, there are four satellite populations, and a second generation of migrated lion has made the Gir and the coastal forest area its home range. Recently, a lioness with her small cubs was reported in the Girnar (Forest Department 1997).

In January 1996 a lioness with two grown cubs visited the human-made forests on Diu Island in the Arabian Sea, which is connected to the mainland by a bridge. The animals might have moved onto the island from the bridge during the night or crossed creeks during low tides. They were captured and brought back to the Gir. The present trend of lion migration continues. After getting complaints from people, the Wildlife Division regularly captures lions from new areas in the Coastal Zone that lions are frequenting, but the lions usually return to these same areas after they are released in the adjoining areas of the Gir.

As per official reports from the Forest Department, two lionesses and three grown cubs were seen in Bhamodra Village in Savarkundla Taluka of Bhavnagar District (now in Amreli District after reorganization), which is 45 kilometers away from the nearest boundary of East Gir. This group was continuously observed in Bhavnagar from November 1997 to January 1998. Similarly, a group consisting of a lioness and two grown cubs was sighted in August 1997 in Ambardi Forest adjacent to the Khodiyar Dam near Dhari Town, which is 20 kilometers from the nearest boundary of the sanctuary. This group has continuously visited since then and has started staying in the area for long periods. The group made kills of bluebills and livestock in the area.

Direct and indirect evidence has revealed that Gir lions have captured entire tracts of the Coastal Zone from Chorvad-Malia in the southwest to Jafrabad in the southeast of the Gir. Similarly, they have moved about 45 kilometers to the east from the eastern boundary of the sanctuary. In the northwest, lions opted for the Girnar as their home range, and the animals migrated 20 kilometers from the northern limit of the Gir. All these areas were connected with the Gir, but they are now separated due to inhabitation and expansion of agriculture. Riverbed and scrub vegetation along the migration routes provide broken corridors for some of these areas.

Management Issues

The implementation of the India Ecodevelopment Project may resolve some of the human-lion conflict problems, but the present trend of lion dispersal in new areas may pose new problems in future. Recent reports indicate that the lions have started staying in new areas away from the Gir, which are close to human

settlements and have low natural prey bases. Lions have no other recourse but to make regular raids in villages for food and water.

Records of this century indicate that human killings by lions were at peak levels during and just after droughts. This has been reduced subsequently because the area has not suffered from a drought since 1988. However, with more lions now living outside the Gir in close proximity to villages, human-lion encounters may escalate in the future.

Killing of lions by poisoning was reported before 1975, but subsequently this became very rare. This trend has again started in villages where people have been poisoning lion kills to get rid of the lions. From 1995 through 1997, fifty-three lion deaths were reported due to natural deaths and deliberate killings. If the present trend continues, this may become a serious problem around the Gir in the future. Management has to be very responsive to tackle this issue by evolving the following strategies:

- *Population Management:* Improvement of the habitat in the protected areas of the Gir, development of habitats of satellite population zones and corridors, capturing problematic animals and supplying them to zoos, capturing the excess populations and translocating them to alternative sites, and keeping them in large enclosures for breeding and maintaining the gene pool are some of the alternatives for managing the increasing lion population.
- *Safety Net Areas:* Although Girnar, Mitiyala, and the Coastal Zone are to be managed as safety net areas for managing the increasing lion population, under the proposal, corridors and habitats of safety net areas are to be developed to improve the prey base (Forest Department 1996). An approach of a comprehensive "Greater Gir Management" system for managing the Gir, satellite population zones, corridors, and wastelands has to evolve. Land use patterns in the entire home range of the lions should be managed in consonance and be consistent with the objectives of management.
- *Limestone Mining:* Wasteland and community lands in the Coastal Zone and around the Gir have limestone, which is an important mineral for cement industries. These industries are expanding at a fast rate and have caused degradation of these areas. The Gir lion and leopard opt for these areas as shelter and corridor zones, which are potential areas for new habitat for lions. This trend has to be controlled in favor of conserving the lion.
- *Tree Density:* The Gir region suffered from frequent droughts at intervals of two to three years, but the Gir has had a normal monsoon during the last decade. Fire protection has been improved, which has resulted in the tremendous recovery of woody vegetation. Gradually, the Gir is becoming dense, and a majority of sanctuary and national park areas today have dense tree cover, with a canopy density of more than 40 percent (Forest Department of Wildlife 1997). There is a discussion amongst wildlife experts on the need for habitat modification by creating openings in the Gir forests. Fairly dense vegetation in the major part may have an adverse impact on the hunting abilities of the lions (Chellam 1993). This subject was debated at many occasions but could not be resolved due to uncertainty and complexity. Delaying the decision may not be in the interest of conservation of the lion in Gir, and an appropriate strategy has to evolve to manage Gir as suitable habitat for lions in order to maintain a higher population within the limits of the sanctuary.
- *Traffic Management:* There are seven public roads covering 101 kilometers in the sanctuary. The number of vehicles passing through the Gir has increased from 132,800 in 1990 to 178,200 in 1994 and 1995. The number of pilgrims visiting the three religious sites in the

sanctuary is also increasing, which causes disturbance to wildlife. More than 100,000 people visit Tulsisham Temple each year; and 37,600 people visited Kankai and Banej Temples in 1994 and 1995 compared to 15,900 in 1987 and 1988. Eleven lions were killed during the last ten years by trains passing through Gir from Visavadar to Talala. Hence, increasing biotic pressure due to roads, railways, and temples has to be controlled to provide secure habitat for the wildlife.

- *Translocation of Lions*: Isolated, single populations of Asiatic lions having narrow genetic variability should make up a subdivision of a population. An attempt was made in 1957 when lions were released in the Chandraprabha Forest in Varansi District of Uttar Pradesh. Their numbers increased from four in 1958 to eleven in 1965, but the population disappeared after that due to unknown reasons (Negi 1969). The state government in 1979 identified the Barda Hills as a second home for Asiatic lions. This rehabilitation project started but failed for unknown reasons when the lions could not be translocated. The Gir lions qualify as prime candidates in a national agenda of wildlife conservation. The government of India asked the Wildlife Institute of India to carry out a study to identify alternative homes for the great cat. Initially, three sites were identified, but the Palpur Kund Forest (an area of approximately 600 square kilometers) in the state of Madhya Pradesh was finally selected after a careful examination of various habitats. In order to ensure success, this time the central and state governments have drawn up a three-phase plan. The first phase (1995–2000) will include creating infrastructure, developing habitat, removing biotic pressure by relocating some villages, and building the prey base. Phase I will give way to the second phase for translocation of some of the lions.

The Role of Wilderness in Ecological and Sustainable Food Security in Asia

G. K. Veeresh

Asia, the largest of the continents, has a surface area of approximately 43,762,344 square kilometers. In Asia, there are some of the coldest lands in the world as well as some of the hottest, the driest, and the wettest.

The wilderness of Asia lies in the following seven ecological zones:

1. A narrow belt of tundra lies along the northern coast of Asia. This region is mostly covered with deep snow and ice for most of the year, except for a brief, cool summer when it is covered with moss and lichen. The most common animal of the tundra region is the reindeer.
2. The taiga region lies to the south of the tundra area and is a much broader belt of coniferous forests. It experiences a severe winter and a brief, warm summer. Fur-bearing animals like foxes, sables, and minks are found there.
3. The steppes are mainly temperate grasslands in western Central Asia and experience a cold winter and a fairly hot summer. Cattle, horses, and camels are reared there.
4. The hot and cold deserts are where only thorny plants, bushes, and poor grasses grow. Arabia, Persia, parts of Central Asia, and Indian deserts are hot deserts where the camel is the most common animal. The plateau of Tibet is a cold desert where the yak is the most common animal.
5. The monsoon forests are found in South, Southeast, and East Asia.
6. The equatorial tropical forests are found in equatorial Southeast Asia.
7. The Mediterranean woodlands are found in Asia and parts of Syria.

Asia, ranging from inside the Arctic Circle in the north to well into the equatorial tropics in the south, and from the arid Arabian region in the west to the rain forests of the Malay Archipelago in the east, offers little uniformity in its flora and fauna. Monsoon winds and the lofty mountains that intercept winds determine Asia's vegetation.

Of the twelve mega-centers of cultivated plants in the world, five of them are in Asia. Crops such as rice, sugarcane, bananas, yams, and ginger originated on the Indian subcontinent (Pakistan, India, Nepal, Bhutan, Bangladesh, Burma, and Ceylon) (see appendix 1). In addition, Asia is the home of several medicinal and aromatic plants from which the Chinese, Tibetans, and Indians have been preparing wonder drugs from time immemorial.

Also, Asia has a diverse animal population. For example, the migratory locusts begin their lives along the enormous reed beds of Asian rivers; the great panda inhabits part of China bordering Tibet; the lesser panda lives in the Himalayan region; and the yak lives in Tibet. Apes are found only in rain forests, whereas the orangutan is restricted to Sumatra and Borneo; the lion is confined to the Gir forests of the Kathiawar Peninsula; the mink deer lives in the Pine-Zone of Kashmir, Nepal, and Sikkim; the Indian one-horned rhinoceros is confined to Nepal and Assam; and the large bird-winged butterflies (*Ornithoptera troides*) are found in the Oriental region.

Extent of Wilderness Available in Asia

The Indian subcontinent has been overexploited, with vast areas under crop cultivation, leaving little uncultivated land except the vast deserts, rugged Himalayan ranges, and western eastern Ghats. Soil productivity is low, and the majority of crop yields are among the lowest in the world because of the soil's low organic matter content. There is no biomass supply from nearby wilderness areas to enrich the soil.

On the contrary, China, with its 100 million hectares of cultivatable land, produces more than 300 million tons of rice compared to the less than 200 million tons produced from 150 million hectares in India. Chinese agriculture is distinguished primarily by its intensity, skill born from forty centuries of experience. To maintain soil fertility in spite of consistent intensive cultivation, farmers replenish the soil with canal mud, night soil, and organic manures.

The rugged uplands of Shansi, Shensi, and Kansu in the northwest, sometimes called Loess Land, is also a highly productive agricultural area. It is covered with a thick mantle of fine-grained, wind-deposited alluvium or loess, which is 15 to 75 meters deep and highly fertile. Water is also readily available there.

The Indian subcontinent and China constitute one-third of Asia's surface area, and Asia has more than one-third of the world's population in one-eleventh of the world's total surface area. The fertile plains of Asia produce almost 90 percent of the world's rice. India has 16 percent of the world's population and owns 15 percent of the world's livestock, but it possess only 2 percent of the world's geographical area, 1 percent of the world's forested area, and 0.5 percent of its pastureland. The English poet William Wordsworth wrote, "Forests precede man, deserts follow him." On the Indian subcontinent, the deserts are expanding, and the forests are shrinking. (The extent of cultivatable land, pasture, and other land uses for numerous countries are outlined in table 1.)

In India, not all nonagricultural lands are wilderness (see table 2). This may also be true for other Asian countries. The concept of wilderness as applicable to Africa, Australia, and Latin America may not be applicable to the Asian continent. Although there are vast areas of desert and mountain ranges, they are bereft of any significant biological activity and play only a small role in sustainable food security. Similarly, stretches of water-logged, saline, and alkaline lands may be classified as wilderness. In India, there are 6,000,000 hectares of waterlogged areas and 3,303,890 hectares of salt-affected areas, and these are expanding because of abusive water management.

Invaders of Wilderness: Past and Present

For many centuries invaders plundered and looted the wealth of the Indian subcontinent, but the real exploitation of forest wealth began with the arrival of Europeans in early nineteenth century. They saw the forest wilderness as something to be tamed, as they did in New Zealand, where 70 percent of the land was

TABLE 1: Countries, Surface Area, and Land Use (Percent of Total Land Area) in Asia, 1994[12].

<i>Country</i>	<i>Surface Area (sq. km.)[13]</i>	<i>Cropland</i>	<i>Permanent Pasture</i>	<i>Other Uses</i>
Afghanistan	652,090	12	n/a	88
Azarbaijan	8,660	23	25	52
Bahrain	653	0.15	n/a	99.85
Bangladesh	144,020	74	5	21
Bhutan	46,600	0.32	n/a	99.70
Cambodia	81,000	22	8	70
China	9,597,078	10	43	47
India	3,287,263	57	4	39
Indonesia	1,919,443	17	7	76
Iran	1,648,000	1	n/a	99
Iraq	434,924	1	n/a	99
Japan	372,431	13	2	85
Jordan	96,000	5	9	86
Kajakistan	271,730	13	70	17
Malaysia	26,020	23	1	76
Mongolia	1,565,000	1	75	24
Myanmar	678,000	14	n/a	86
Nepal	141,400	17	15	68
Oman	268,800	0	5	95
Pakistan	803,943	28	6	66
Philippines	300,000	31	4	65
Saudi Arabia	2,400,000	2	56	42
Singapore	618	2	0	98
Sri Lanka	65,609	29	7	64
Syria	185,680	30	45	25
Taiwan	3,598	n/a	n/a	n/a
Thailand	514,000	41	2	58
Turkey	779,452	36	16	48
UAE	92,100	0	2	98
Uzbekistan	447,040	11	50	39
Vietnam	329,566	21	1	78
Yemen Republic	287,082	3	30	67

covered with forests when they arrived in 1840. Now, only 22 percent of the land is forested. The Europeans were the first to turn previously inaccessible forest wilderness areas into coffee, tea, rubber, pepper, and cardamom plantations. Although coffee was first brought to India in 1600 by the Muslim pilgrim Baba Budan, it was only raised in a few backyard lots until the Europeans opened commercial plantations. By 1869 there were 662 European coffee plantations, which covered 58,670 hectares. Plantation roads welcomed smuggling and poaching in the vast virgin forest. Some poachers took pride in killing

TABLE 2: The Land Use Classification for India 1994–1995[14].

	<i>Area (m ha.)</i>	<i>Percent of Reporting Area</i>
I. Geographical area	328.73	
II. Reporting area for land utilization	304.88	
A. Forests	68.39	22.4
B. Land not available for cultivation (1+2)	41.28	13.6
1. Land under nonagricultural use	22.51	
2. Barren land	18.77	
C. Other uncultivated land, excluding fallow land (1+2+3)	29.08	9.6
1. Permanent pasture and other grazing land	11.24	
2. Miscellaneous tree crop and grove land, not included in net area shown	3.63	
3. Cultivable wasteland	14.21	
D. Fallow lands (1+2)	23.30	7.6
1. Fallow land other than current fallow land	9.77	
2. Current fallow land	13.53	
E. Net area sown (F, G)	142.82	46.8
F. Total cropped area (gross)	188.15	100.0
G. Area sown more than once	45.33	
III. Net area irrigated	53.00	
IV. Gross irrigated area	70.64	

the maximum number of wild animals, including tigers. Also, the introduction of conifer plantations in the Himalayan range destroyed the local vegetation because nothing grows under these trees.

In modern times, invasive plants and insect pests have been harming the ecology and environment of and threatening food security in the Indian subcontinent. Plants like parthenium (*Parthenium hysterophorus*) and eupatorium (*Chromolena odorata*) have spread like wildfire and suppressed the local vegetation, depriving the grazing area and forest growth. Insect pests like the spiraling whitefly (*Aleurodycus disperses*) and serpentine leaf miner (*Liriomyza trifolii*) have found a large number of hosts in the newly colonized lands and are also threatening the food security of the region. These are only a few documented examples; there may be others, which may also be altering the ecology, environment, and food security in Asia.

Methods of Assessing the Ecology and Environment

Many environmentalists, ecologists, and conservationists from all over the world have used large animals or “flagship species” as indicator taxa as a focus for conservation and monitoring the environment. The preponderance of studies using indicator taxa have relied on vertebrates, especially those “species of high public interest.” However, the vertebrates, as indicator taxa, are time-consuming and expensive to properly investigate.

Arthropod species, especially insects, as indicator taxa may afford cheaper and quicker means of study. One such study using tiger beetles (*Coleoptera: Cicinidelidae*) as indicator taxa for biodiversity and conservation studies has been successfully demonstrated.

Advantages of Wilderness

Wilderness surrounding cultivated land has many advantages, particularly in supplying a source of natural pest enemies and biomass needed for enriching the soil with organic matter. For example, the coffee stem borer (*Xylotrechus quadripes*) is a major pest of arabica coffee in India. It has few natural enemies in a vast monoculture area, but plantations that neighbor wilderness areas harbor a higher population of natural enemies. Also, soils rich in organic matter appear to suppress diseases naturally and may contain antagonistic or antibiotic flora. All over Asia, but particularly on the Indian subcontinent, crop pests and diseases have increased fourfold, despite the unprecedented amount of pesticides used during the last fifty years, and are one of the major threats to food security in the region. In addition, wilderness is the safety locker for many vanishing and endangered species of plants and animals.

What Ails in Asia for Sustainable Food Security

Sustainable food security has been defined as development that meets the needs for the present without compromising the ability of future generations to meet their needs. According to United Nations population and grain production projections for 1996, the global population can be comfortably fed (in terms of adequate nutrition standards) until 2030, when global population is estimated to stabilize. But if American and European standards of consumption are used, six or seven planet resources would be needed to deal with the problem. Gandhiji's prophetic warning that the earth has enough for everyone's need but not for everyone's greed has been extensively echoed by ecologists and environmentalists all over the world. According to Felipe Benavides, the Peruvian story of the Incas and the present condition of Peru is due to "the greed of other nations and immorality of government officials." The situation in Asia may not be different from that of Peru.

The present-day generation in Asia is trying to attain American and European lifestyle standards and food habits without realizing the limitations of natural resources. Less than five percent of the world population (Americans and Europeans) has access to more than 60 percent of world's natural resources. It would be disastrous for Asia to try and attain these standards. The growth rate of world agriculture has been declining from a 3 percent increase in 1960 to a 2.3 percent increase in 1970 to a 2 percent increase in 1980 to a 1.8 percent increase in 1990. The trend may continue if it is not reversed, particularly in Asia.

The 1996 United Nations Development Program report pointed out that

the world has become more polarized and [the] gulf between the rich and the poor has widened—the poorest 20 percent of the world's people saw their share of global income decline from 2.3 to 1.4 percent in the last 30 years and in the last five years, in spite of many global conferences on food security and hunger, the gap between the rich and poor has further widened from a ratio of 30:1 to a ratio of 61:1.

Unfortunately, a large percentage of the poorest 20 percent of the world's population live in Asia.

Role of Wilderness and Future Strategy for Sustainable Food Security in Asia

The following precepts are essential to guarantee sustainable food security in Asia:

1. Wilderness is a must, as a source of medicinal and aromatic plants and conservation of genetic material for future food security. It is necessary to know whether populations of medicinal plants like sarpagandhi, rauwolfia, serpentina, or wild relatives of cultivated plants like wild rice (*Oryza nivana*) are threatened with extinction in the shrinking wilderness.
2. The biggest problem of food security in Asia is the low productivity of the soil because of centuries of land exploitation. One of the basic requirements to increase the productivity of the soil is to increase the organic matter content. The required organic matter has to come from the wasteland and the wilderness, so it must be protected and preserved. In India alone, approximately 90 million hectares of wasteland is available for watershed development. There is great potential for rejuvenating the wasteland as has been shown by the National Watershed Development Project. Once developed, these lands need constant vigilance to protect and preserve them. Even the deserts can be made to bloom, if only proper attention is given.
3. Everyone who owns more than five hectares of agricultural land must be required to reserve 10 percent of their land for natural vegetative growth that will supply not only enough biomass to increase the productivity of their land but also provide habitat for natural enemies of crop pests and improve the ecology of the surrounding environment.
4. A good organic amendment will improve the soil health, texture, and structure; suppress plant diseases naturally; give strength to plants to withstand pests and diseases, which reduces the need for chemical fertilizers and synthetic pesticides, which in turn saves money, reduces environmental pollution, and promotes better health. However, the biomass has to be scientifically composted with the right proportion of animal excreta to get the maximum benefit.
5. No country can wholly depend on its laws to protect the environment and the judicious use of natural resources unless the people are educated and realize that their survival depends on the survival of everything around them. Asian peoples have survived for millennia, despite a population explosion, because of their sustainable food habits that depend on locally available minor millets, the coarse and nutritive grains that have survived for centuries, even through monsoon vagaries. Gandhiji said that civilization meant "not the multiplication of wants but deliberate and voluntary reduction of selfish wants." The day the countries of this continent have to rely on the arrival of food from other places, they will have lost their civilization.

APPENDIX I: Prominent Examples of Crop Species That Originated on the Indian Subcontinent.

Cereals and Millets

- Rice (*Oryza sativa*)
- Little millet (*Panicum sumatrense*)
- Kodo millet (*Paspalum scrobiculatum*)

Legumes and Pulses

- Blackgram/Urud (*Vigna mungo*)
- Moth bean (*V. aconitifolia*)
- Pigeonpea/Arhar (*Cajanus cajan*)
- Horsegram (*Macrotyloma uniflorum*)

Fruits

- Mango (*Mangifera indica*)
- Banana (*Musa* spp.)
- Jamun (*Syzygium cumini*)
- Jackfruit (*Artocarpus heterophyllus*)
- Karonda (*Carissa congesta*)
- Khirni (*Manilkara hexandra*)
- Phalsa (*Grewia subinaequalis*)
- Bael (*Aegle marmelos*)
- Wood apple (*Feronia limonia*)
- Kokam (*Garcinia indica*)

Vegetables

- Eggplant/Brinjal (*Solanum melongera*)
- Ridge gourd and smooth gourd/Tori (*Luffa* spp.)
- Round gourd/Tinda (*Citrullus lanatus*)
- Pointed gourd (*Trichosanthes dioica*)
- Taros/Arbi (*Colocasia esculenta*)
- Yams (*Dioscorea* spp.)
- Jimikand (*Amorphophallus campanulatus*)
- Kundri (*Coccinea indica*)
- Cucumber (*Cucumis sativus*)

Oilseeds

- Brassica* spp. (rai, sarson, and toria types)

Spices and Condiments

- Turmeric (*Curcuma domestica*)
- Ginger (*Zingiber officinale*)
- Cardamom (*Elettaria cardamom*)
- Long pepper (*Piper nigrum*)
- Bengal cardamom (*Amomum aromaticum*)
- Betel leaf and Cinnamon/Dalcini (*Cinnamomum zeylanicum*)

Other Crops

- Jute (*Corchorus capsularis*)
- Tree cotton (*Gossypium arboreum*)
- Sugarcane (*Saccharum officinarum*)
- Sunhemp (*Crotalaria juncea*)
- Tea (*Camallia sinensis*)
- Dhaincha (*Sesbania sesban*)
- Bamboos



Malaysia

Protected Area Systems of Malaysia

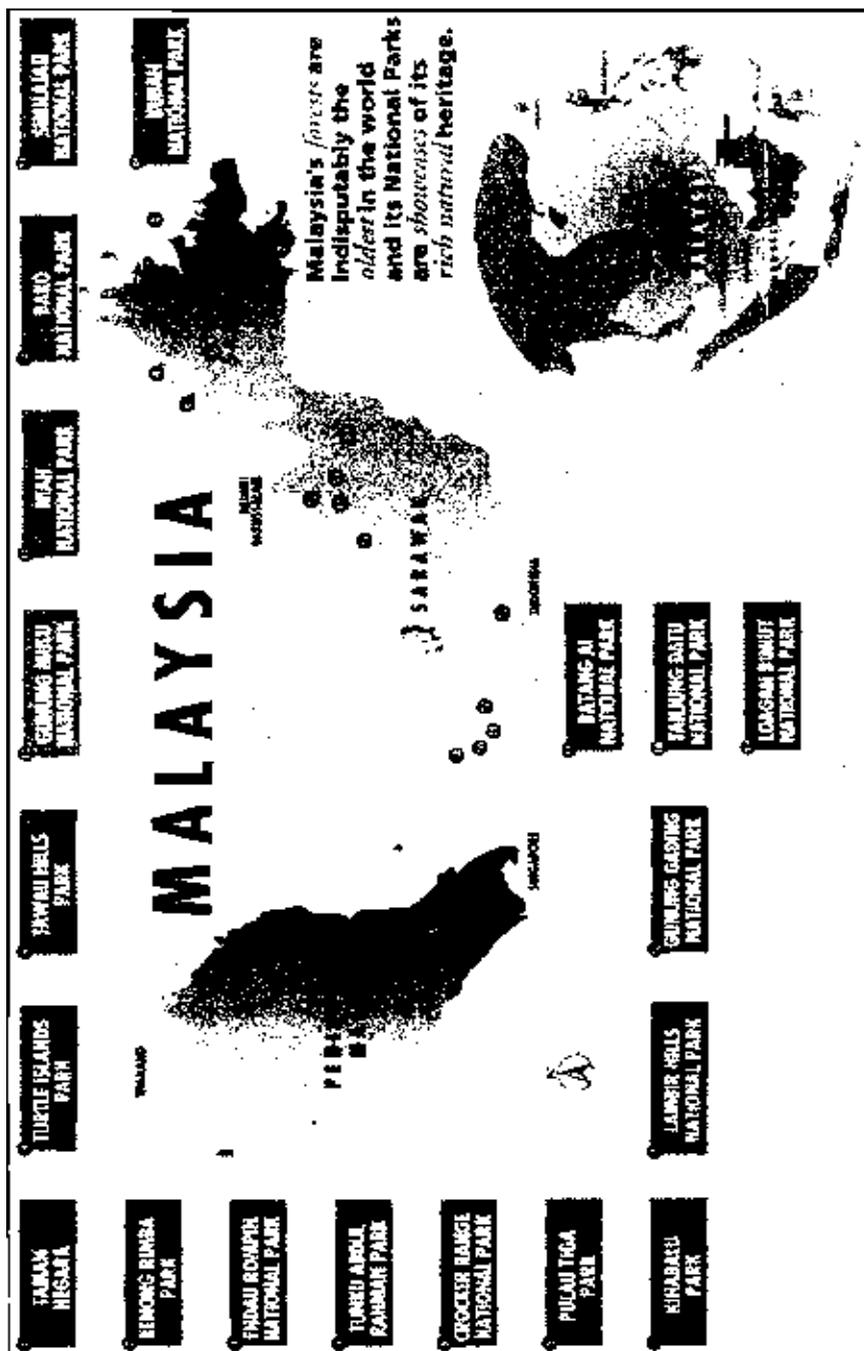
Jasmi bin Abdul

Malaysia covers an area of about 32.86 million hectares, consisting of Peninsular Malaysia and the states of Sabah and Sarawak. It is one of the twelve mega-diversity countries in the world. Malaysia provides a home to about 300 species of mammals, 750 species of birds, 350 species of reptiles, 165 species of amphibians, and more than 300 species of freshwater fish. Although the landmass covers only 0.2 percent of the earth's surface, it has 6 percent of the total fauna and flora of the world. The law to protect wildlife in Malaysia was initiated in 1884, and the first wildlife reserve was established in 1903. Today, forest covers about 18.91 million hectares, or 57 percent of total land area of Malaysia. Malaysia now has 2.12 million hectares designated as national parks, wildlife sanctuaries, wildlife reserves, and marine parks, or 7 percent of its total land areas. Malaysia has six major protected area systems, including the national park, state park, wildlife reserve, wildlife sanctuary, marine park, and Ramsar site. Malaysia has thirteen national parks, six state parks, thirty-nine wildlife reserves, wilderness areas, and thirty-nine marine parks. The most famous national parks include Taman Negara National Park (4,343 square kilometers), Kinabalu National Park (754 square kilometers), and Gunung Mulu National Park (530 square kilometers). These major protected area systems not only play important roles in conserving most of the biodiversity, but also for the preservation of the geological, cultural, historical, and ethnobotanical values for this country.

Introduction

Malaysia is divided into two different geographic regions: the mainland of Malay Archipelago, or Peninsular Malaysia, and East Malaysia—the latter formed by two states, Sarawak and Sabah of Borneo. Malaysia is located at latitude 1° and 7°N, and longitude 100° and 119°E (see map 1). The area covers 13.16 million hectares in Peninsular Malaysia, 12.33 million hectares in Sarawak, and 7.37 million hectares in Sabah, with a total land area of 32.86 million hectares. The tropical rain forest is the basic permanent natural cover in the country. This forest type can be divided into six categories: mangrove swamp forest, peat swamp forest, lowland dipterocarp forest, hill dipterocarp forest, montane forest, and heat forest. The forest covers about 18.91 million hectares or 57 percent of the total land area. Protected areas cover 2.12 million hectares, or approximately 7 percent of the total land area.

The first legislation created to protect wildlife species in this country was established in 1884 by the Strait Settlements. The establishment of protected area systems in Malaysia started in 1903 when Chior Game Reserve (4,330 hectares) was the first protected area in the country. This game reserve was established specifically to protect and conserve the wild cattle, or the gaur (*Bos gaurus hubbaki*). Between the years 1903 and 1957, more protected areas such as national parks, wildlife reserves, wildlife sanctuaries, and state parks were created. In Peninsular Malaysia alone twenty protected areas have been established,



MAP 1. National Park in Malaysia

TABLE 1: List of National Parks and State Parks in Malaysia.

<i>Name of the Protected Areas</i>	<i>Year of Establishment</i>	<i>Area Cover (ha.)</i>
1. Taman Negara National Park (P)	1938-1939	434,300
2. Bako National Park (SR)	1957	2,728
3. Niah National Park (SR)	1957	3,140
4. Kinabala National Park (SB)	1972	75,400
5. Lambir National Park (SR)	1975	6,952
6. Gunung Mulu National Park (SR)	1976	52,866
7. Similajau National Park (SR)	1978	7,067
8. Gunung Gading National Park (SR)	1983	4,106
9. Endau Rompin National Park (P)	1989	48,800
10. Kubah National Park (SR)	1989	2,230
11. Batang Air National Park (SR)	1991	24,040
12. Loagan Bunut National Park (SR)	1991	10,736
13. Tanjung Datu National Park (SR)	1994	1,379
<i>Total</i>		<i>667,744</i>

SOURCE: DWNP 1997; Francis 1998; and Safuan 1998).

NOTE: P=Peninsular Malaysia; SR=Sarawak; SB=Sabah.

and this includes the King George V National Park, or Taman Negara (434,300 hectares), which was established in 1939. The states of Sarawak and Sabah followed the same action by establishing their own protected areas such as Gunung Mulu National Park (52,866 hectares) and Niah National Park (3,140 hectares), Bakoh National Park (2,728 hectares) in Sarawak, and Kinabalu Park (75,400 hectares) in Sabah (see table 1).

Several other protected area systems were also established after Malaysia got its independence in 1957 and after the formation of Malaysian Federation in 1963. For example, a marine park was established after 1985, and Endau Rompin National Park in 1989. Many state parks were established in Sarawak and Sabah through the same procedure. At present, the federal and the state governments are more aware of and concerned about having protected areas in their respective states due to public demand for natural and wilderness areas for conservation, recreation, and protection of natural heritage (see table 2).

Objective

Conservation

The main objective for establishing protected areas in Malaysia is for conservation of fauna and flora. The national park is one of the most important protected areas for this purpose. A national park should be large enough to sustain and propagate some rare and endangered species of plants and animals in their natural environments. For example, the Taman Negara National Park in Peninsular Malaysia provides a sanctuary to several endangered and rare species of mammals such as the Sumatran rhinoceros (*Dicerohinus sumatransis*), the clouded leopard (*Neofelis nebulosa*), the Malayan tiger (*Panthera tigris*

TABLE 2: List of Wildlife Reserves, Game Reserves, Nature Parks, and Marine Parks in Malaysia.

<i>Name of the Protected Areas</i>	<i>Year of Establishment</i>	<i>Area cover (ha.)</i>
1. Chior Wildlife Reserve	1903	4,300
2. Krau Wildlife Reserve	1923	53,095
3. Cameron Highlands Wildlife Reserve	1958	64,953
4. Fraser Hill Wildlife Reserve	1922	1,943
5. Sungai Dusun Wildlife Reserve	1964	4,330
6. Bukit Kutu Wildlife Reserve	1922	2,979
7. Pulau Tioman Wildlife Reserve	1972	7,160
8. Pahang Tua Bird Sanctuary	1953	1,335
9. Kuala Selangor Wildlife Reserve	1922	44
10. Sungkai Wildlife Reserve	1928	2,468
11. Batu Gajah Bird Sanctuary	1952	4.5
12. River Terrapin Reserve Center	1993	8
13. Bukit Sungai Putih Wildlife Reserve	1931	40
14. Templers Park	1955	1,011
15. Klang Gate Wildlife Reserve	1935	130
16. Bukit Nanas Wildlife Reserve	1934	9
17. Selangor Golf Club Wildlife Reserve	1923	403
18. Four Island Bird Sanctuary	NA	0.5
19. Tanjung Tuan Wildlife Reserve	1971	68
20. Endau-Kluang Wildlife Reserve	1933	101,527
21. Endau-Kota Tinggi (East) WR	1933	61,959
22. Endau-Kota Tinggi (West)	1933	7,413
23. Pulau Redang Marine Park	NA	NA
24. Pulau Perhentian Besar Marine Park	NA	NA
25. Pulau Kapas Marine Park	NA	NA
26. Pulau Tenggol Marine Park	NA	NA
27. Pulau Payar Marine Park	NA	NA
28. Pulau Kaca Marine Park	NA	NA
29. Pulau Tinggi Marine Park	NA	NA
30. Pulau Tioman Marine Park	NA	NA
31. Paya Indah, Sepang	1996	5,000
32. Kuala Selango Nature Park	1990	300
33. Tasek Bera Ramsar Site	1994	38,000

SOURCE: DWNP and DANCED 1996; Fisheries Department.

NOTE: NA=Not Available.

corbetti), the Malayan gaur (*Bos gaurus hubbaki*), and the Malayan elephant (*Elaphas maximus*). Kinabalu National Park harbors more than 1,200 species of wild orchid—many endemic to the park. Gunung Mulu National Park contains the most interesting and unique cave systems and the largest cave chambers in the world. The Deer Cave at Gunung Mulu National Park is a roosting place for more than 5 million insect bats that come out every afternoon to feed in the surrounding forest.

Preservation

Most of the national parks or protected areas are set aside to preserve some unique geological formation, limestone outcrop, cave, historical or cultural site, or marine life. Niah National Park and Gunung Mulu National Park in Sarawak contain important archaeological sites that have historical value important to researchers and to the country.

Ecotourism

Most of the national parks in Malaysia are based on ecotourism activities. These activities are limited and confined to a certain area of the park. Most of the activities, such as wildlife observation, hiking, mountain climbing, boating, rapid shooting, caving, fishing, camping, jungle tracking, and swimming, are well described in brochures and pamphlets and are controlled by the park authorities. Only a small portion of the park will be used for development of the accommodations and basic facilities such as chalets, rest houses, restaurants, offices, and staff quarters. The ecotourism activities provide a chance for visitors to enjoy and appreciate the natural beauty of the national park and bring a good income or revenue to local peoples and to the country. Taman Negara National Park receives approximately 60,000 visitors per year, while Kinabalu National Park is visited by at least 200,000 visitors per year. About 20,000 people per year visit Gunung Mulu National Park.

The influx of visitors to parks depends on the number of recreational activities, accessibility, facilities, and services for the visitors. Many visitor facilities and management of the tourist complexes in parks have been privatized. For example, the facilities, transportation services, and accommodations at Taman Negara National Park, Kinabalu National Park, and Gunung Mulu National Park have been privatized. This enables the park authority to concentrate on enforcement, research, trail maintenance, wildlife conservation, extension, and interpretation programs for the visitors. This saves money. The park authority can concentrate on important aspects of park management, such as conservation of fauna and flora.

Research and Education

Many protected areas, such as national parks, wildlife reserves, marine parks, marine reserves and wilderness areas, provide a base for scientific research and educational programs. Many research activities on fauna and flora or socioeconomic issues and anthropology have been carried out in the protected areas. The protected areas provide tremendous numbers of fauna and flora for researchers. They often find new species of insect, invertebrate, or plant in Taman Negara. Many large and small mammals are concentrated in this protected area. The protection provided by strong legislation has proven that much of the biodiversity can be conserved.

In Malaysia, more than 50 percent of the population is under thirty years old. This younger generation plays an important role in the future conservation of Malaysia's protected areas. Many schools, government departments, institutional centers, and nongovernmental organizations provide special education on nature, the environment, and outdoor recreation. Nature study centers that cater to large numbers of school children play a vital role in conservation programs. The park authorities such as the Department

of Wildlife and National Parks (DWNP), Sabah National Parks, Forestry Department Sarawak, Forest Research Institute Malaysia, Forestry Department, and universities have their own nature study centers located in many protected and wilderness areas. The school nature clubs use many of these facilities during weekends and school holidays.

Ethnobotanical

The natives or aboriginal peoples are the most important communities that live in many of Malaysia's protected areas. For example, the Batik in Taman Negara National Park, the Penan in Gunung Mulu National Park, and the Orang Dusun in Kinabalu National Park. These people have been living in the protected areas for many years. Their lives depend on forest products, such as wildlife and plants for food and shelter. These people have a vast knowledge of how to use forest products for medicinal treatments. In Peninsular Malaysia, at least twenty aboriginal tribes live and depend on the forest. In Taman Negara, the Batik have lived here for the last hundred years. The Batik from the Negrito group use the park for hunting and for shelter. These nomadic people are a part of the ecosystem and depend totally on forest resources. Their knowledge of medicinal plants is a potential asset to the modern medical field.

Legislation

Peninsular Malaysia

The formation or creation of any protected area, such as national park and wildlife reserve, has to follow certain legislation. This legislation is developed by either the federal or state authorities (see table 3). The first legislation to protect wildlife was established in 1884. In 1921 the Wild Animals and Wild Birds Protection Ordinance was created. This ordinance was replaced by the 1955 Wild Animals and Wild Birds Protection Ordinance, which was later replaced by the Wildlife Protection Act of 1972. In Peninsular

TABLE 3: List of Legislation Used on the Establishment of the Protected Areas in Malaysia.

<i>Name of the Legislation</i>	<i>Year of Establishment</i>	<i>Organization</i>
1. Wild Animals and Birds Prot. Enactment	1902, 1921, 1923, 1925	Game Dpt.
2. Taman Negara Enactment	1938	Game Dpt.
3. Wild Animals and Birds Prot. Ordinance	1955	Game Dpt.
4. Protection Wildlife Act no. 76	1972	DWNP
5. National Park Act no. 223	1980	DWNP
6. Fisheries Act no. 317	1985	Fisheries Dpt
7. Wildlife Protection Ordinance no. 2	1990	Sarawak
8. National Parks and Nature Reser. Ordinance	1958	Sarawak
9. Fauna Conservation Ordinance	1963	Sabah
10. Park Enactment	1984	Sabah
11. National Land Code, Act 56	1965	Federal/State
12. Ramsar Convention	1994	Pahang State
13. National Park (Corporation) Enac. Johore	1989	Johore State

SOURCE: DWNP and DANCED 1996; Francis 1998; Safuan 1998.

Malaysia, two legislations regarding the establishment of protected areas have been used. The first legislation was the Wildlife Protection Act no. 6 of 1972. This act is a federal law. Under Sections 45 to 47 of the act, the ruler or governor of the state, after consultation with the federal authority, can set aside any land or wilderness areas to be gazetted as a wildlife reserve.

For the establishment of the national parks, the federal government has created the National Parks Act of 1980. Due to several factors, such as priority land conversion and individual state interest on protected areas, not a single national park was established under this legislation. King George V National Park, or Taman Negara, was established under the National Parks Enactment no. 2 (Pahang) in 1939, National Park Enactment no. 3 (Terengganu) in 1938, and Taman Negara Enactment no. 14 (Kelantan) in 1938. Taman Negara National Park, game reserves, and wildlife reserves in Peninsular Malaysia are administered under the Ministry of Science, Technology, and Environment. The total land area under the protected areas in Peninsular Malaysia is about 745,000 hectares (DWNP and DANCED 1996).

The total land area under the protected areas in Peninsular Malaysia is about 745,000 hectares.

The second category of legislation is developed by individual state governments. For example, the National Park (Corporation) Johore was developed in 1989 by the state of Johore. This area covers about 48,905 hectares of Endau-Rompin forest area and is managed by the Johore state government. They also fund any development activities and projects in the area. The park is headed by the district officer from the State Secretary Office and several other appointed wildlife officers and park rangers.

Marine parks and marine reserves were established under the Fisheries Act 1985 and also by the individual state legislations for Sabah and Sarawak. The Fisheries Act 1985 is a federal law. The Fisheries Department has the authority to manage, enforce, and create any marine park or marine reserves with the prior consent of the state's government. Marine park and marine reserve are defined as a marine water body area gazetted for the protection of fauna and flora at the point of the lower tide to two nautical miles toward the sea. Terrestrial areas of an island are not considered part of the marine park. In Peninsular Malaysia, nineteen terrestrial islands have been gazetted as wildlife reserves. The main objectives of creating marine parks and marine reserves are to protect, conserve, and propagate any fauna and flora within the area for scientific, educational, and recreational purposes.

The Ramsar Site is something new to Malaysia. Tasek Bera (38,466 hectares) is the first site designated for the Ramsar site. It consists of 2,039 hectares of natural lake and wetland areas. Malaysia became a member of the Ramsar Parties Convention in 1994. Many wetland areas in Malaysia are considered potential Ramsar Sites, especially the undisturbed mangrove swamp forests on the west coast of Peninsular Malaysia (Larut-Matang Mangrove Swamp Forest in Perak and Tanjung Pia in Johore).

Paya Indah, or "Beautiful Swamp," is the last category of protected wetland area in Peninsular Malaysia. This area was established for the purposes of protecting wetland fauna and flora. Paya Indah covers about 5,000 hectares of wetland areas located on the old mining areas and Kuala Langat Utara peat swamp forest near the Kuala Lumpur International Airport (KLIA). This area is managed and funded partly by the government and by the private sector, but it is run by the private organization, Malaysian Wetland Foundation (MWF).

Sarawak

Sarawak offers some of the richest natural area in Malaysia. More than 60 percent of 12.33 million hectares of land area in Sarawak is forested land. Protection and creation of protected areas such as national park and wildlife reserves have been established under the Sarawak state legislation. The National

Parks and Nature Reserve Ordinance of Sarawak was created in 1958. Wildlife Protection Ordinance no. 2 of Sarawak was established in 1990. Both legislations aim to conserve most of the protected areas in Sarawak. Today, Sarawak has established seven national parks and three wildlife reserves with a total area of 1 million hectares. The most famous national parks are the Niah National Park and Gunung Mulu National Park. The newest wildlife reserve is the Lantjak-Entimau National Park (600,000 hectares). Recreation activities are allowed only in the national park, not in the wildlife reserve. Both national parks and wildlife reserves are managed by the Wildlife and National Parks Division under the Forestry Department of Sarawak.

Sabah

Sabah is better known as the “state under the wind.” The total land area of Sabah is about 7.37 million hectares. Mount Kinabalu, the highest mountain in Southeast Asia (4,101 meters above sea level) is located in the Kinabalu National Park. Sabah is the richest in biodiversity, and many plants and animals are endemic to this state. About 1,200 species of wild orchids can be found in the Kinabalu National Park, and many are endemic to this area. Legislation for creating the establishment of protected areas was started in 1963. This legislation is called Fauna Conservation Ordinance of 1963 and Park Enactment of 1984. Through this legislation, the state government of Sabah has created six national parks with a total land area of approximately 380,000 hectares. The Sabah National Park Authority manages all the national parks in the state. This authority is under the Sabah Park Board Management Committee, which is chaired by the state minister for tourism and development.

Management

Federal Authority

As mentioned earlier, two government bodies have the power or authority to manage the protected areas in Malaysia. The first one is the federal government. In many cases the federal legislation, such as the Protection Wildlife Act no. 75 of 1972, is only applied in Peninsular Malaysia. Any area gazetted under this law or any concurrent law will be managed by the federal authority and the DWNP or PERHILITAN. Prior to 1972, most of the Wildlife Department in Peninsular Malaysia were under state jurisdiction but became federalized in 1977. Today the DWNP manages the Taman Negara National Park and thirty-four other wildlife reserves, wildlife sanctuaries, and special protected areas in Peninsular Malaysia, with a total area of approximately 745,000 hectares. Approximately 737 people work for the DWNP, with thirty-five professionals and scientists. The revenue collected from licenses, permits, or other wildlife products goes to the state treasury. Only compounds and court fines go into the federal government.

State Authority

Sarawak and Sabah have been establishing protected areas since the colonial time. In Sarawak, the State Legislative Council creates and gazettes any unique area within the state jurisdiction as a potential national park or wildlife reserve. The same procedure is used by the state of Sabah. The same legislative committee, or EXCO, can amend the law on the protection of wildlife and protected areas. It is not difficult to pass laws and create protected areas in these states. Sarawak has established seven national parks and three wildlife reserves, with a total area of 1 million hectares. Sabah has three national parks and three marine parks. In Peninsular Malaysia, Endau-Rompin National Park in Johore was established under the state legislation called National Park (Corporation) Johore, in 1989.

Other Authority

Tasek Bera in the state of Pahang is a newly created Ramsar Site for wetland conservation. This is the first protected area set aside under the international convention for conservation. The management of this area is under the state authority, which employs a district officer to manage and enforce the law on this area. Very strict development regulations have been imposed on this area as required under the Ramsar Convention. A nongovernmental authority, the MWF, manages special wetland areas. This private organization was established to develop and manage peat swamp forest near the KLIA for wetland fauna and flora conservation. The federal government is especially interested in the conservation and ecotourism aspects. Kuala Selangor Nature Park (300 hectares) is another privately run wilderness area. This park is managed by the Malayan Nature Society. This mangrove swamp forest belongs to the Selangor state government, which plays an important role in protecting the land as stated under the Land Code. The DWNP is more concerned with protecting species of wild fauna.

Recommendations

Malaysia started its protected area systems ninety-five years ago. The strong legislation and commitment provided by the federal and state governments has proven successful in many states. Today the need for more protected areas is increasing. To achieve this objective several recommendations follow:

- Federal and state authorities must work closely to develop more protected and wilderness areas in the near future.
- Current legislation on protected areas should be revised and, if possible, amended to suit the current situation at both federal and state government levels.
- Schedule park staff training to increase management skills and knowledge in protected and wilderness areas.
- Increase joint cooperation in the research fields by the local research institutions and international research organizations.
- Cultivate more public awareness on the protection and conservation of protected areas.

Conclusion

Much of the biodiversity in Malaysia's protected areas has yet to be explored and studied. Developing public awareness of protected and wilderness areas will help conservation, and such awareness needs to encompass everyone from school children to policy makers. This will help sustain protected areas over time.



Wildlands and Their Status in Protected Area Management in Nepal

Rabi Bahadur Bista

The Kingdom of Nepal is blessed with diverse flora and fauna. This diversity is a reflection of altitudinal and climatic variations within a geographical area of 14.71 million hectares. It is estimated that about 54 percent of the country is covered with natural vegetation. A total of 118 ecosystems with 75 vegetation types and 35 forest types have been identified in Nepal. The country has a biological richness of both the Indo-Malayan and Palearctic realms, including endemic Himalayan flora and fauna.

The conservation of wildlands and biological diversity is an integral part of the national policy of Nepal. Both the Forests and National Park and Wildlife Conservation Acts empower His Majesty's Government of Nepal (HMG/N) to designate and declare protected forests as well as six types of protected areas in Nepal. So far more than 16 percent of the total area of Nepal has been officially designated as protected areas. If the area under buffer zone management is included, the percentage of these protected areas increases to 25 percent. HMG/N is also authorized to declare national watersheds and special areas such as wetlands, Siwaliks, and habitats of endangered and important wildlife species, including the Himalayas, as sensitive areas.

Wildlands include not only the protected areas but also inaccessible national forests outside the protected areas, high Himal, wetlands, and other natural landscapes.

Nepal is committed to preserve and conserve these valuable natural resources, not only for the benefit of the present generation, but also for the future generations.

The Ministry of Forests and Soil Conservation (MFSC) is the policy-making and intersectoral coordinating body for natural environment and sustainable management of forests and wildlands. The Department of National Parks and Wildlife Conservation (DNPWC) under the ministry implements activities related to management of protected areas. The Department of Forests is responsible for the implementation of national, leasehold, community, and private forestry programs outside the protected areas. The Department of Soil Conservation is responsible for the implementation of soil and water conservation and watershed management programs.

National and international nongovernmental organizations (NGOs) are also actively engaged in the conservation of wildlands and biodiversity. They are the King Mahendra Trust for Nature Conservation, The Mountain Institute, the World Wildlife Fund (WWF), The World Conservation Union, and others.

Nepal has gained some strength and faced some challenges in conserving and managing wildlands and ecosystems. The involvement of local people and NGOs in conservation of wildlands and community forests is very positive. Similarly, the implementation of integrated watershed management planning has not only resulted in economic benefits to the rural people but has also helped in conserving soil, water,

and forests. The government's policy is evolving toward involving local people and local NGOs in natural resource conservation and management. Incentive-based management systems are more appropriate and efficient than command and control policies. Overexploitation of forest resources and fragmentation of natural ecosystems are still the main challenges of wildlands conservation in Nepal. Establishment and management of protected areas have ensured biodiversity conservation in the country. Increase of wildlife populations has at times led to livestock and crop depredation.

Illegal trade of wildlife and their parts is an endemic problem. Antipoaching units have been established to control poaching and trade; however, this action is found insufficient. It will require education and poverty alleviation, including, in our context, regional cooperation.

Conservation of ecosystems and wildlands not only has national significance, but its benefits are shared globally. Therefore, local and national needs should be reconciled with regional and global concerns.

Background Information

Situated between India and China, Nepal's diversity in wildlands is a reflection of its stark variation in altitude and the associated diversity in flora and fauna. Within a horizontal distance of about 150 kilometers, the topography increases from 75 meters in the southern subtropics of the Tetai to 8,848 meters in the north, the highest point on earth. Thus Nepal, with an area of 14.71 million hectares, has both the Indo-Malayan and Palearctic realms, including endemic Himalayan flora and fauna.

The country has about 54 percent of the area under some sort of vegetation cover (forest area 37 percent, shrubland 5 percent, and grassland 12 percent). A total of 118 ecosystems, seventy-five vegetation, and thirty-five forest types have been identified. The vegetation contains more than 6,500 species of flowering plants, over 1,500 fungal species, and over 350 lichen species. Equally diverse is the range of fauna. It is estimated that about 175 mammal species, 836 bird species, 147 reptile and amphibian species, 180 species of fish, 640 species of butterfly, and over 6,000 species of moth are found in Nepal. With only 0.1 percent of the world's total area, Nepal contains over 2 percent of the flowering plants, 8 percent of the birds, and 4 percent of the mammals—and many of them are globally significant. This shows that Nepal has wilderness values that are of global significance, and that the country could be regarded as one of the world's wilderness "hotspots."

The World Conservation Union (IUCN) categorizes wilderness area as the protected area managed mainly for wilderness protection. For our purpose, we define wilderness areas as those areas that are of limited nonconsumptive use, ranging from conservation to recreation and on to research.

This definition includes not only the legally protected areas such as national parks and reserves, but also other areas such as the protected forests, including the religious forests, as well inaccessible forested and nonforested areas, including the high Himalayas. The protected areas of Nepal are mainly confined to the lower Terai and the high Himal region. The midhills are underrepresented in the protected area system.

The major problems related to the conservation and management of these wilderness areas are poverty and an inappropriate incentive system for the surrounding population to participate in the conservation programs. Although we are now crafting and implementing conservation policies to facilitate villagers' participation in the conservation program, poverty alleviation is still the major challenge affecting people's welfare and conservation in Nepal. HMG/N has introduced an innovative policy of buffer zone around the legally protected area of Nepal. This policy of 1993 has a provision of allocating up to 50 percent of the total revenue of a park and reserve in a buffer zone so that the people residing

in these buffer zones have an authority to make decisions regarding the expenditure of the allocated fund and the sharing of benefits accruing from those investments. Similarly, Nepal has a track record of involving national and international NGOs in the management of specially designated conservation areas. These initiatives have provided some incentives to the local people in the conservation of the protected areas. The buffer zone regulations have also helped in the alleviation of poverty by channeling some funds in these areas.

The rate of deforestation and land degradation in the national forests outside the protected areas is still high in Nepal. Presently, the annual rate of deforestation is estimated to be about 0.4 percent. However, the implementation of community forest policy has provided incentives to local villagers in the management of forests assigned to them. Although the government has a policy of gradually transferring parts of national forests to local users' groups, only about 10 percent of the potential community forest areas have been thus far been handed over to these groups. What we are convinced of is that community forests operated by active users' groups are better managed than otherwise.

Sustainability of these wilderness areas requires that these natural resources be conserved and managed according to productive potential, national needs, and natural processes so that the ecosystems inherent in these areas are allowed to function without major interventions and interruptions.

Protected Areas versus Wilderness

Nepal has been quite successful in the designation of various kinds of protected areas in different ecological zones of the country. If the area under buffer zone is included, the proportion of this area increases to 25 percent. Besides, there are areas like high Himal that are naturally protected and that constitute an additional 22 percent of the land area.

These protected areas have been the repositories for wild living organisms. They have also been very popular tourist destinations. For example, about 52 percent of tourists visit Nepal for entertainment, and 23 percent for trekking and mountaineering. Tourism also provides about 24 percent of the foreign currency earning of the country.

Categories of Protected Area Systems

From the legal and wilderness perspectives, Nepal's protected areas can be categorized into six types. They are:

- *National Park*: An area set aside for the conservation and management of the natural environment including wildlife, plants, and landscapes.
- *Strict Nature Reserve*: An area of ecological or other significance set aside for scientific study.
- *Wildlife Reserve*: An area set aside for the conservation and management of wildlife (resources) and their habitats.
- *Hunting Reserve*: An area set aside for the conservation and management of wildlife to provide hunting for legal hunters.
- *Conservation Area*: An area set aside for the conservation of the natural environment and natural resources for its utilization in a balanced way on the basis of an integrated plan.
- *Buffer Zone*: An area designated around national parks and reserves in order to provide forestry products to the local people.

Other Forest Areas

As mentioned above, forests outside the protected area systems are categorized into national forests and private forests, depending upon the ownership of the land on which trees and forestry resources stand. National forests are those forested lands owned by the government but with management rights that may be delegated to various entities, including the government. Private forests are those forested areas, the ownership and management of which lies within the private entities. National forests are further categorized into government managed forests, protected forests, community forests, leasehold forests, and religious forests depending upon which agency manages the biomass of these forests. Local people easily access most of the forests of Nepal in order to meet their daily needs of fuelwood, fodder, pole, timber, and medicinal plant products. Therefore, the further away forests are from the villagers' settlements, the greater their wilderness value.

Evolution of Protected Areas

Prior to the 1960s Nepal had a large undisturbed forest area made up of diverse fauna. The demands of the growing population for both land and forest products coupled with an inadequate forest management system increased the pressure on forest resources. This had an adverse impact on wilderness area. However, since the 1950s HMG/N's policies and priorities on protected areas have shifted from direct control and management by the government to people's participation even in wilderness management and conservation.

The Master Plan for the Forestry Sector (MPFS) was completed in 1989. This plan lays out strategies and policies on ecosystem and genetic conservation. The MPFS has stressed the need to manage Nepal's diverse ecosystems by conserving the floral and faunal diversity through legal measures and people's participation, strengthening institutional capabilities, and encouraging research and extension. The current ninth development plan also stipulates the conservation of ecosystems and genetic resources as an integral part of natural resource management and has emphasized their preservation, promotion, and management with the involvement of local people through ensuring equitable sharing of benefits.

The in situ conservation of Nepal's biological resources has gained momentum after the initiation of the Protected Area System (PAS). The PAS includes fifteen protected areas. Various types of protected areas created under the 1973 act cover representative samples of Palearctic and Indo-Malayan flora and fauna. Royal Chitwan National Park (RCNP) and Sagarmatha National Park (SNP) are included in the World Heritage list. At present Shey-Phoksundo National Park is being considered for inclusion on the list. Other protected areas have national significance in the protection of Nepal's species and landscape.

HMG/N has introduced various measures to address the increasing global concern for wildlife management and conservation in representative ecosystems through institutional development, legislative instruments, and program implementation. National level wildlife conservation and management took shape both legally and institutionally only after the establishment of the DNPWC and enactment of the 1973 NPWC Act. Section (3) of the act empowers the government to declare any part of an area as a national park, wildlife reserve, hunting reserve, or conservation area. The RCNP and Langtang National Park were the first gazetted as protected areas in 1973. The act prohibits most human activities—wildlife hunting, livestock grazing, and cultivation in the protected areas. Licensed hunting is provided for in Dhorpatan Hunting Reserve.

In an amendment to the 1973 NPWC Act, the government introduced the protected area category of "conservation area" where wildlife management and people's livelihood issues are jointly undertaken.

The conservation and community development activities were concurrently and initially undertaken in the Annapurna Conservation Area Project (ACAP). The success of ACAP has demonstrated the possibilities for people's involvement in the conservation and sustainable use of biological resources. The Makalu-Barun Conservation Area under the joint administration of HMG/N and The Mountain Institute has also adopted the same ACAP model in the conservation and development of the area. A similar approach has also been initiated in the management of Kanchenjunga Conservation Area with the collaboration of World Wildlife Fund-Nepal Program.

HMG/N's efforts in wildlife conservation through habitat conservation and management and initiation of antipoaching measures have demonstrated an increase in the population of some threatened species. For example, the population of the one-horned rhino (*Rhinoceros unicornis*) in RCNP alone increased from sixty to eighty individuals in the late 1960s to 460 in 1994 and is now believed to be well over 500.

Policy and Legislation

The importance of conserving wild species of fauna and flora was first recognized by HMG/N in Nepal's first five-year plan (1956–1961). The first legislation to protect Nepal's wildlife was introduced more than a hundred years back in the 1840s by restricting the hunting of certain wild animals. The Central Zoo was also established during the Rana regime. The first practical measures to conserve Nepal's endangered fauna started with the establishment of Mriga Kung as a royal hunting reserve in the district of Chitwan. The associated Rhino Patrol (*Gaında gasti*) began in 1961 and was largely successful in stopping the poaching of larger mammals. However, whether the positive protection measures outweighed the "negative" losses of animals to the hunter's gun is not known. Suklaphanta also became a royal hunting reserve in 1965. Management of wild animals was initiated with the declaration of RCNP along with the enactment of the National Parks and Wildlife Conservation Act, 1973. The other Terai/Siwaliks protected areas were created later: Royal Suklaphanta Wildlife Reserve, Koshi Tappu Wildlife Reserve, Royal Bardia National Park in 1976, and Parsa Wildlife Reserve in 1984. The protection of Nepal's flora and fauna is ensured within the PAS largely following the IUCN's criteria. The policy and legal measures made for these purposes have national application, and there are few aspects tailor-made to suit the different conditions and threats to wildlands in each physiographic zone.

Policy

The government has initiated various conservation policies for biological diversity and forest conservation: the Master Plan for the Forestry Sector (MPFS) (HMG/N, ADB, FINNIDA 1989); National Conservation Strategy (HMG/N and IUCN, 1983); Nepal Environmental Policy and Action Plan (HMG/N 1993); and the current (ninth) five-year plan. The old policies were formulated before Nepal's ratification of the global Convention on Biological Diversity (UNCED) in 1992 and hence the policy measures do not clearly reflect the need to conserve biological diversity in the spirit of UNCED. It is only in the last decade that the widespread realization of the importance of conserving the earth's biological diversity has emerged.

In 1991 the revised forestry sector policy following from master-plan recommendations had as a major objective of the conservation of ecosystems and genetic resources. It has recommended measures for the sustainable management of land and forest resources according to their ecological capacity to ensure the conservation of flora and fauna, with priority given to representing the various ecosystems in the PAS. The policy recognizes the need for carrying out environmental impact assessments before

implementing development programs, and calls for minimizing park-people conflict, and the regulation of tourism activities.

In the same year as the MPFS was published, a National Conservation Strategy was prepared and endorsed by the National Planning Commission. It recommended the protection of areas that contain essential habitats for terrestrial and aquatic mammals, migratory birds, freshwater fish, and rare and/or endangered species. It seeks the conservation of Nepal's natural resource base through sustainable use.

The Nepal Environmental Policy and Action Plan, as endorsed by the Environment Protection Council in 1993, recommended:

- the preservation of endemic and endangered species and their habitats;
- the promotion of private and public institutions for biological resource inventory and conservation; and
- the strengthening of the capacity of the DNPWC to act as the main institution responsible for biodiversity conservation.

The Ninth Five-Year National Development Plan has recognized the role of local people in managing Nepal's forests by sharing the benefits that accrue from them. This signifies HMG/N's resolve to involve local people in the management and share benefits with them. This new direction in policy is critical since an increasing spiral of poverty and environmental damage threatens the forest resources. The plan estimates that 42 percent of the population live below the poverty line, lacking the basic necessities of life. The plan calls for 7,510 community forestry users' groups to be constituted during its five-year period. By the end of July 1998, 6,600 forestry users' groups were formed, covering an area of 450,000 hectares. The environment and resource conservation policy of the current plan calls for the recording of the country's natural heritage and expanding the conservation of biological diversity.

A further revision in the policy is being made to accommodate our commitment towards wildlands and biodiversity conservation wherein it is recommended that the present land use will remain the same. Wilderness values will receive priority in managing protected areas. Species, their mixture and composition, wildlands, and ecosystems will be recognized as essential elements for creating biodiversity.

Forestry resources will be managed and utilized according to their ecological potential. A holistic approach will be taken up for managing biodiversity on an ecosystem basis. Collaborative management planning of forests, watersheds, wildlife, and national parks will be promoted.

Legislation

Nepal has several government decrees on wildlife conservation. The Wild Conservation Act of 1972 was the first to identify the need for special protection of wildlands and biodiversity in the country. This act provided legal protection to the rhinoceros and tiger habitats in Chitwan. As a result, a rhino sanctuary was established, which is now a part of the Royal Chitwan National Park. The conservation act of 1972 is considered to be a leading legal document for the conservation of wildlands. It provides a regulatory mechanism for the conservation of protected areas and wild species. It has been amended four times. This act also empowers HMG/N through DNPWC to propose and establish six different categories of protected areas, namely national parks, wildlife reserves, strict nature reserves, hunting reserves, conservation areas, and buffer zones. The Buffer Zone Act, the fourth amendment, is an area in which people's participation is pivotal to the protection of biodiversity in a given protected area. Under the act, NPWC regulations (bylaws) are site specific. For example, National Parks and Wildlife Conservation Regulations, 1974; Royal

Chitwan National Park Regulations, 1974; Wildlife Reserves Regulations, 1977; Himalayan National Parks Regulations, 1979; and Khaptad National Park Regulations, 1985. The Forest Act, 1991 and the regulations made thereunder are relevant instruments in declaring protected forests, wetlands, and special areas.

Several acts on conservation such as the Aquatic Animals Protection Act, 1961; the King Mahendra Trust for Nature Conservation, 1982; and the Soil Conservation Act, 1982 are in force. The above are directly or indirectly concerned with conservation of biodiversity at various stages.

International Conventions

Nepal, a signatory of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), restricts trade and transit of endangered species of fauna and flora. Nepal is also a member of the International Tropical Timber Organization.

The DNPWC is the management authority for the implementation of the convention. Similarly, Nepal is a member of the Ramsar Convention for Wetlands Conservation and of the World Heritage Convention.

Also, in February 1994 Nepal approved the Convention on Biological Diversity. The convention has three objectives. They are:

1. Conservation of biodiversity
2. Sustainable use of the resources
3. Fair and equitable sharing of the benefits arising from the use of the genetic resources

Land Use

The Master Plan for the Forestry Sector using Land Resources Mapping Project data has divided the land use of the country into six categories, which are:

1. Cultivated lands
2. Noncultivated inclusions
3. Grasslands
4. Forestlands
5. Shrublands
6. Other lands

Existing land also divided into five physiographic zones based on the ecological characteristics of the country.

1. *High Himal:* This zone occupies 23 percent of Nepal. It lies between the upper limits of forest vegetation and the crest of the Himalayas. It is an area of rocks, ice-covered massifs, snowfields, valley glaciers, and meadowlands. The mountains form one of the most rigid climatic barriers in the world, marking the northern limit of the monsoon's influence. Most of the high Himal is in a natural state, but many meadows on the slopes of glacial valley have been overgrazed, resulting in sod breakage and soil movement. Overgrazing has eliminated forests from many of the valley slopes and bottomlands. This zone, because of its inaccessibility, is recognized as a natural wilderness area.

2. *High Mountains*: This zone occupies 20 percent of the country and consists of the land between the heavy populated middle mountains and the almost unpopulated high Himal. It can be described as the foot slopes of the latter. Its upper boundary is the forest line at about 4,000 meters. It lies within about 2,300 to 3,000 meters on the ridges, but as low as 1,000 meters in the valleys. The high mountain slopes are long, straight, and steep, and therefore sensitive to erosion, giving high rates of sediment delivery.
3. *Mid Mountains*: This zone is the great central belt of Nepal where the country's origins and characters are most deeply rooted, with an area extending to about 30 percent of the kingdom. It is composed almost entirely of a network of ridges and valleys; less than 5 percent is flat land. The lowest part is the river bottomland in the east at about 300 meters. Long and intensive use of the land is attested to by intricate, extensive terrace systems and inevitably by a larger number of landslide scars, areas of eroded soil, and loss of forestland.
4. *Siwaliks*: The Siwaliks are the series of low, hogback ridges in a sinuous pattern that runs the length of Nepal. They enclose several cultivated valleys, locally known as inner Terai, or duns, and some intricately dissected out-wash plains. This zone occupies 13 percent of the country, at an elevation of 120 to 2,000 meters. The Siwaliks are the first and lowest ridge of the Himalayan mountain system. The Ganges plain is at their southern foot; the Mahabharats Lekh, the southern edge of the middle mountains, lies to the north. Most of the ridges remain under forest because their coarse-textured stony, shallow soils and steep slopes make them unsuitable for cultivation.
5. *Terai*: This zone is bounded in the north by the first ridges of the Siwaliks; its southern boundary is the Indian border. It covers about 14 percent of the country. It is a plain whose elevation ranges from 60 to 330 meters, with a gentle southward slope of less than 1 percent. Along its northern edge lies the Bhabar, a subzone characterized by boulders and gravelly, very fine-drained soils, which make it suitable for agriculture. The Terai is being developed agriculturally and industrially, so there is heavy pressure on its forests.

Status of Wildlands

Wildlands are recognized as forestlands designated as limited use areas, which are categorized as protected areas such as national parks, wildlife reserves, hunting reserves, conservation areas, buffer zones, and strict nature reserves; protected forests such as Siwaliks, wetlands, habitats of endangered species, and sensitive areas, including the northern Himalayan range, which is highly inaccessible. Recently national watersheds were also added to the list. However, the strict nature reserve, a category of protected area designated and managed mainly for wilderness protection, has yet to take its place in Nepal.

There are some places that are maintained or managed, in their original wildlands, for conservation of ecosystem and genetic resources. Such wildlands include protected areas and protected national forests, high Himal, and wetlands. Protected areas cover national parks, wildlife reserves, hunting reserves, conservation areas, and buffer zones. The Forests Act, 1993 authorized the government to declare any part of a national forest as protected forest for its environmental, scientific, and cultural or other importance. So, protected forests could include some special forest patches, Siwaliks, and wetlands.

TABLE 1: Land Use in Physiographic Zones of Nepal in 1000s of Hectare.

<i>Region</i>	<i>Natural Plantation Forests</i>	<i>Enriched Forests</i>	<i>Shrublands and Degraded Forests</i>	<i>Grasslands Inclusions</i>	<i>Noncultivated Lands</i>	<i>Farmlands</i>	<i>Other</i>	<i>Total</i>
High Himal	155	0	67	885	1	8	2,234	3,350
High mountains	1,629	5	176	508	148	244	245	2,960
Mid mountains	1,762	19	404	278	667	1,223	59	4,442
Siwaliks	1,433	4	29	16	59	269	75	1,886
Terai	445	30	30	58	123	1,308	116	2,110
<i>Sub total</i>	2,524	69	706	1,745	998	3,052	2,729	14,748
<i>Percentage</i>	37	0	5	12	7	21	19	100

TABLE 2: List of National Parks and Their Areas.

<i>National Parks</i>	<i>Area Covered in Thousands of Hectares</i>	<i>Physiographic Zone</i>
Royal Chitwan National Park	93.2	Terai and Siwaliks
Sagarmatha National Park	114.8	High Himal
Langtang National Park	171	High Himal and High Mountains
Rara National Park	10.6	High Mountains
Shey-Phoksundo National Park	355.5	High Himal
Khaptad National Park	22.5	High Mountains and Middle Mountains
Royal Bardia National Park	96.8	Terai and Siwaliks
Makalu Barun National Park	150.0	High Himal
<i>Total</i>	<i>1014.4</i>	

National Parks

National Park and Wildlife Conservation Act, 1973 authorized the government to declare any area that is important for environmental, scientific, cultural, or other aspects as a national park. Eight protected areas are thus far declared as national parks. The names, areas, and approximate physiographic zones covered by these national parks are given in table 2.

These national parks have been declared basically for in situ conservation of flora and fauna. RCNP is the oldest world-acclaimed national park in the country. Its main objective is the conservation of the one-horned rhinoceros, which once existed over the entire Indian subcontinent. It is estimated from the census that about 500 rhinos live in Chitwan. Besides rhino, the park also supports other endangered animals such as tiger, gharial, crocodile, and birds like the great hornbill. This is also the most visited park in the country due to its easy accessibility. Every year about 64,000 tourists visit this park, giving approximately U.S. \$800,000 as revenue to the government. Likewise, Royal Bardia National Park supports tiger, elephant, and other species. Similarly, national parks in the high Himal and high mountains support snow leopard, red panda, musk deer, and many rare plant species, which are used in Eastern medicine.

Wildlife Reserves

Wildlife reserves are also declared according to the National Parks and Wildlife Conservation Act 1973. There are five protected areas declared as wildlife reserves so far. The names, areas, and approximate physiographic zones covered by these reserves are given in table 3.

These wildlife reserves also support endangered animals such as swamp deer in Royal Shukla Phanta Wildlife Reserve and wild water buffalo in Koshi Tappu Wildlife Reserve. Besides these endangered animals, these reserves also support endangered animals like tiger. Other animals like deer and bear, and rare plants are also supported by wildlife reserves. Shivapuri Watershed and Wildlife Reserve was established with the main objective of generating clean and potable drinking water to the Kathmandu valley. Major rivers that flow in the Kathmandu valley, such as Bagmati and Bisnumati, originate from this reserve.

TABLE 3: List of Wildlife Reserves and Their Areas.

<i>Wildlife Reserves</i>	<i>Area Covered in Thousands of Hectares</i>	<i>Physiographic Zone</i>
Royal Shuklphanta Wildlife Reserve	30.5	Terai
Koshi Tappu Wildlife Reserve	17.5	Terai
Parsa Wildlife Reserve	49.9	Terai
Dhorpatan Hunting Reserve	132.5	High Mountains
Shivapuri Watershed and Wildlife Reserve	14.4	Middle Mountains
<i>Total</i>	<i>244.8</i>	

Conservation Area

In 1983 an amendment to the National Parks and Wildlife Conservation Act, 1973 led to the creation of the conservation area category of protected areas. Conservation areas are declared with the objective of biodiversity conservation, as well as supporting local people through the use of resources in their locality. There are three protected areas declared as conservation areas so far. Manaslu Conservation Area is on its way to declaration by HMG/N. The names, areas, and approximate physiographic zones covered by these conservation areas are given in table 4.

Conservation areas, with the purpose of biodiversity conservation, are completely different from national parks because local people participate in biodiversity conservation in these areas. From their participation, local people also get direct and indirect benefits such as availability of firewood, forage, and timber; and opportunity for employment and income generation through guiding trekkers, teashops, and more. In such cases, local people get benefits from special income generation activities based on local raw materials such as grass and bamboo. These conservation area programs are supposed to help with biodiversity conservation due to the improved economic status of local peoples.

TABLE 4: List of Conservation Areas and Their Areas

<i>Conservation Areas</i>	<i>Area Covered in Thousands of Hectares</i>	<i>Approximate Physiographic Zone</i>
Annapurna Conservation Area	762.9	High Mountains
Makalu Barun Conservation Area	83	High Mountains
Kanchanjanga Conservation Area	165	High Mountains
<i>Total</i>	<i>1,010.9</i>	

Buffer Zones

According to the 1993 amendment of the National Park and Wildlife Conservation Act, 1973, a buffer zone could be declared by HMG/N around the national parks and wildlife reserves. Buffer zones are declared within and outside the national parks and wildlife reserves close to villages and human settlements. In some protected areas, such as RCNP, RBNP, KTWLR, PWLR, RSWLR, the buffer zone declaration and management is already under way, while for others the process is being initiated. Once declared, buffer zones are managed according to Buffer Zone Management Rules 1996. For buffer zone management, the warden of the national park or wildlife reserve has to prepare an overall management plan. This plan will designate areas for different activities and identify programs for buffer zone development. According to the management plan, government forests in the buffer zone could be handed over to local user groups as their own community forests to fulfill their subsistence needs for firewood, fodder, timber, and other forest products. As in community forests, management of buffer zone forests will be the entire responsibility of buffer zone user groups. These groups of local people in buffer zone government could spend 50 percent of the revenue earned from the protected area for local community development works.

Siwaliks

Siwaliks are also a very important region for wildland management and biodiversity conservation. There are many flora and fauna that exist in the Siwaliks and Terai. Two national parks in the Terai cover part of the Siwaliks. In biodiversity conservation together with Terai, Siwaliks support endangered species such as tiger, rhino, and black buck. This region also supports many small animals such as Indian pangolin (*Manis crassicaudata*) and hispid hare (*Caprolagus hispidus*). These endangered animals are in the Siwaliks outside the national parks. Besides these, Siwaliks also support threatened species such as butterflies, birds, amphibians, and reptiles. Siwaliks also support threatened plants such as *Hoya amottiana*, *Cycas pectinata*, sati sal (*Dalbergia latifolia*), canes (*Calamys*, *Calamys leptospadix*), and so on.

Wetlands

Wetlands are critical for a number of endangered species such as water buffalo, swamp deer, fishing cat, gharial, and Gangetic dolphin. Even tiger, rhino, and elephant spend considerable time relaxing in wetlands. Although Sukla Phanta and Koshi Tappu Wildlife Reserves, as well as other national parks and wildlife reserves, cover some wetlands, there are many other wetlands that are outside protected areas. Ghodaghodi Tal of Kailali, Ghatal of Dadeldhura, Jagadishpur Reservoir of Kapilbastu, and Maipokhkari of Illam are famous wetlands in Nepal. Similarly, Saptakoshi, Kaligandaki, Narayani, and Karnali and its tributaries are important for biodiversity conservation. These wetlands support many endangered species of birds, reptiles, and amphibians as well as other important small lives. About 187 species of birds are known to depend on wetlands. Of the wetland birds, thirty-nine species are identified as threatened at the national level. Out of fifty-one important wetlands in the Terai, Biodiversity Profile Project has collected baseline data from forty-two. These wetlands are in jeopardy due to conversion into agricultural land after draining out the water. As a signatory of the Ramsar Convention, Nepal is also internationally obliged to protect such wetlands. Wetland sites in Nepal are estimated in table 5.

Protected Forests

In Nepal there are many government forests that are outside the protected area system but are rich in biodiversity. Most of these areas are not yet officially declared as protected forests. However,

TABLE 5: Wetland Sites in Nepal.

Development Region	Hill and Mountains		Terai		Total	(%)
	Number of Sites	%	Number of Sites	%		
Eastern	24	(9.9)	18	(17.4)	42	(17.4)
Central	15	(6.3)	37	(15.3)	52	(21.5)
Western	16	(6.6)	34	(14.1)	50	(20.7)
Mid Western	22	(9.0)	12	(5.0)	34	(14.0)
Far Western	2	(0.6)	62	(25.6)	64	(26.4)
<i>Total</i>	<i>79</i>	<i>(32.6)</i>	<i>163</i>	<i>(67.4)</i>	<i>242</i>	<i>(100)</i>

they are protected in practice for biodiversity conservation. Most management plans made for sustainable forest management call for protection of sensitive areas such as Siwaliks, habitats of endangered species, and wetlands, as well as double the width of the river on each side. They also have potential to be converted into protected areas in the future. Important protected forests that are rich in biodiversity include Milke Danda for rhododendrons. Similarly, Phulchoki and Nagarjun are important for the conservation of various plants and animals. Resungha Forests of Gulmi; the Badi Malika Forest lying between Achham, Bajura, and Kalikot; and forest patches of Trijuga and Ratuwamai of Jhapa are also important for wildland and biodiversity conservation. Protected forests are more important in the midhills because this region is represented by only 1 percent of the existing protected area systems. Establishment of big national parks or wildlife reserves in the midhills is also not possible due to the mosaic settlement pattern of villages. Therefore, the midhills must get priority in establishing protected forests so that all important flora and fauna are protected.

Special Areas

These areas include high Himal and important high altitude watersheds, which are also important wildlands for biodiversity conservation. Animals like musk deer, snow leopard, and blue sheep exist in this region. Important trees like Himalayan birch (*Betula utilis*), *Abies spectabilis*, and *Juniperus indica* are found in this region. Similarly, important medicinal plants such as *yarchagumba* (fungus in caterpillar) and *silajet* exist in this region. Because of its remoteness, study of existing biodiversity in the region is very limited, and we may find many new species when it is studied in detail. There is also controversy in the collection and export permits given to the collectors of medicinal plants growing in these areas. Some claim that they are being overharvested. However, baseline data are lacking and we need continuous monitoring to know the status of harvests. High Himal has a unique importance for the magnificent view.

Impacts on Sustainability

Sustainability requires continuity, full participation, a holistic approach, ecosystem-based management planning, and benefits in perpetuity. It is therefore necessary that Nepal embark upon management planning of its forestry resources, taking into account the multifaceted roles of the wildlands for biodiversity conservation in order to protect and conserve all types of ecosystems. At the same time Nepal must manage forests to produce goods and services for the people, manage watersheds to safeguard life and property, support agriculture to produce crops, and implement community development activities for enhancing local economies.

Due to the lack of conservation programs, some animals, such as clouded leopard, are on the verge of extinction in Nepal. The problem is thought to be worse in flora. Many plants from Nepal are supposed to be extinct due to their heavy harvesting for medicinal purposes.

Poaching of animals is still a big problem. To control poaching of animals, the Royal Nepal Army is mobilized in national parks and wildlife reserves. Severe punishment—up to Rs. 100,000 in fines and fifteen years imprisonment—is given for the poaching of threatened animals. In spite of all these initiatives, animal poaching has not stopped. Tigers are killed for their bones, rhinos are killed for their horns, and musk deer are killed for their musk. Recently, there has been a change in the model of controlling poaching. Antipoaching units have been formed that consist of rangers, game scouts, and local persons. These antipoaching units are mobile teams. They travel from village to village and get information about poachers' plans to kill the endangered animals. This information is communicated to the warden's office. This measure is very effective, and the rate of poaching has come down. However, presently such teams lack communication equipment.

With the low economic status of the poor people residing near these important wildland areas, sustainability will be questionable in the long run if the economic status of the people remains as it is today. Therefore, local community development, employment, and income-generation programs must be implemented for the benefit of the people residing near these wildlands. Efforts are being made for implementing programs such as training for income-generating activities (weaving, handicraft making, trek guiding, etc.) that directly help in biodiversity conservation. Such programs are incorporated in the Makalu Barun Conservation Area Project, the Park People Project, and also in other conservation areas.

In the traditional protection model, there have been conflicts between protected area staff and local people, because once a park is established, local people are banned from getting the benefits that they have been traditionally getting from the protected areas:

- Collecting forest products
- Grazing domestic animals
- Clearing forests for agriculture
- Channeling water from protected areas to agriculture
- Collecting animals and their eggs
- Setting fires for new grasses and hunting

In the present conservation model with the declaration of conservation areas, a management plan of the area is prepared in collaboration with local people. Local people manage the conservation areas for their subsistence needs, including firewood, fodder, and timber, with biodiversity conservation as the top priority.

For conservation of plants, HMG/N has prohibited the extraction of two species of medicinal plants, and ten species are prohibited for export in raw form. Prohibited species for collections are:

Cordyceps sinensis (yarsagumba) and *Dactylorhiza hatagirea* (panchaunle)

Species prohibited for export in raw form are:

- *Cordyceps sinensis*, *Dactylorhiza hatagirea*, *Cinamomum glaucescens jhayu* (lichens), *Abies spectabilis*, *Nardostachys grandiflora*, *Rauwolfia serpentina*, *silajit*, *Taxus wallichina*, and *Valeriana wallichii*

Future Prospects

Wildlands of Nepal have attracted international interest and regional concern. Conservation and management of forestry resources must be carried out in a holistic manner on an ecosystem basis. Programs under the MFSC must receive full support at home and abroad in order for millions in Nepal, India, and Bangladesh to prosper.

Apart from RCNP and SNP being recognized as outstanding natural areas of the world, Kanchanjaunga Conservation Area is included as the Gift of the Nature on the WWF list. Work is underway enlisting Shey Phoksundo National Park to be included on the World Heritage List.

However, there are tremendous costs involved in protecting these wildlands. Eighty percent of the total budget of the DNPWC is spent on protecting parks, reserves, and conservation areas. Certainly, deputation of the army has saved the biodiversity of these places, but this issue should be considered for establishing new national parks.

Park-people conflict has been a never-ending problem, so studies have to be conducted on the use of resources without affecting the biodiversity of the area. For example, in recent years cutting of thatch grass has been allowed in Terai national parks and wildlife reserves for about fifteen days. This has also generated some income for park management. So far, impact of cutting thatch is not considered as negative in the biodiversity management of the area. If done in the right way, such an approach will help in getting more people to participate as compared to strict protection in protected areas. Such an approach of revenue collection and use of national park resources is also emphasized in the ninth plan of HMG/N.

The midhill ecosystem is represented by only 1 percent of the area in the existing protected area systems. In the mid-hills, there are no big patches of forests left that can be managed as national parks or wildlife reserves. Moreover, in the midhill people live in mosaic patterns in forests. At the same time, this region supports forty-four mammals and 147 birds, out of which 110 species are at risk. So, in the midhills, biodiversity conservation should be an important component of community forestry programs wherever possible.

For sustainability of biodiversity in wildlands, local community development programs, local income-generation programs, and ecotourism programs are very important in Nepal. Presently, the ninth plan has also emphasized the importance of these programs.

For nationwide wildland conservation, the existing capability of the DNPWC also has to be strengthened. Although the Department of Forests staff is supposed to protect wildland biodiversity outside protected areas, they have other work and are not trained in biodiversity management. So, such issues must be tackled in time.

As a small developing country, Nepal's needs are varied and required heavily in different sectors, and the government does not have enough money to support the necessary programs. So, the MFSC is in the process of formulating the Nepal Trust Fund for Biodiversity Conservation, with cooperation from the World Bank. If everything happens in the planned way, this trust fund should be operating within a few years. If this materializes, operation of the Nepal Trust Fund for Biodiversity Conservation will be a big step in biodiversity and wildlands conservation.

So far, efforts of HMG/N are seen as being positive toward biodiversity conservation. There is also an improvement in the status of endangered animals, which is proved by the fact that the population of rhinos has increased from approximately eighty in the 1960s to 500 at present. In Nepal, due to the lack of financial resources of the government and poor economic status of local people residing near wildlands, biodiversity conservation is still a challenge and remains vulnerable. Institutions such as IUCN, WWF, and UNDP should continue generous support of the programs. At the same time, the government has to

show more commitment toward the conservation of biodiversity in the wildlands. Financial assistance from bilateral donor communities, UNEP, GEF, and so on, is necessary. If all of these issues are resolved, sustainable biodiversity conservation in Nepal will become a reality, and global communities can enjoy the benefits from wildlands conservation in Nepal.

TABLE 6: List of National Parks and Their Areas.		
<i>National Parks</i>	<i>Area Covered in Thousands of Hectare</i>	<i>Approximate Physiographic Zone</i>
Royal Chitwan National Park	93.2	Siwaliks and Terai
Sagarmatha National Park	114.8	High Himal
Langtang National Park	171	High Himal and High Mountains
Rara National Park	10.6	High Mountains
Shey-Phok-Sundo National Park	355.5	High Himal
Khaptad National Park	22.5	High and Middle Mountains
Royal Bardia National Park	96.8	Terai
Makalu Barun National Park	150.0	High Himal
<i>Total</i>	<i>1014.4</i>	

TABLE 7: List of Wildlife Reserves and Their Areas.		
<i>Wildlife Reserves</i>	<i>Area Covered in Thousands of Hectare</i>	<i>Approximate Physiographic Zone</i>
Royal Shukla-Phanta Wildlife Reserve	30.5	Terai
Koshi Tappu Wildlife Reserve	17.5	Terai
Parsa Wildlife Reserve	49.9	Terai
Dhorpatan Hunting Reserve	132.5	High Mountains
Shivapuri Watershed and Wildlife Reserve	14.4	Middle Mountains
<i>Total</i>	<i>244.8</i>	

TABLE 8: List of Conservation Areas and Their Areas.		
<i>Conservation Areas</i>	<i>Area Covered in Thousands of Hectare</i>	<i>Approximate Physiographic Zone</i>
Annapurna Conservation Area	762.9	High Mountains
Makalu Barun Conservation Area	83	High Mountains
Kanchanjanga Conservation Area	165	High Mountains
<i>Total</i>	<i>1010.9</i>	

Sri Lanka

Origins, Evolution, and Present Status of the Protected Areas of Sri Lanka

Lyn de Alwis

Sri Lanka in Ancient Times

The old Asian belief systems, based largely on agricultural societies, saw the wilderness as provider of all human requirements. It was to be treated with awe and respect so that its bounty could be shared with all other living beings within it. Humanity was in no way superior. Spiritually, the wilderness was seen as a source of inspiration and healing for troubled minds. Whether it was Lord Buddha, Jesus Christ, or Prophet Mohammed, they all withdrew into the quietness of the wilderness to contemplate, to seek the truth, or to pray.

Sri Lanka was fortunate to receive the gift of Buddhism some 300 years before Christ, bringing with it love and compassion for all beings, especially for the forests. King Dharmasoka of India and King Devenampiya Tissa of Sri Lanka were great friends, and the former was quick to share gifts with the latter. No sooner had he embraced the teachings of Lord Buddha than he sent his son to the Sinhala king to share the message of this great truth. Later, King Dharmasoka sent missionaries to Sri Lanka to explain the Buddhist dharma. One teaching explained that humanity and all living beings were equal:

O great King, the birds of the air and the animals have an equal right to live in this land as thou: the land belongs to the people and all living beings and thou art only the guardian of it.

The ancient texts and chronicles bear witness to the fact that monarchs, clergy, and the laity ensured that this principle was never violated. Every opportunity was taken to spread this message throughout the country. The concept of “sanctuary” for animals was born.

While protection of wild landscape for watershed purposes is an ancient practice in Sri Lanka, the sanctuary concept preceded even that. In a twelfth-century stone-pillar inscription near Anuradhapura, the king (Kirti Nissanka Malla)

ordered by beat of drums that no animal should be killed within a radius of 7 gaw [1 gaw = 5.1 km] of the city of Anuradhapura; he gave security to animals, he gave security to the fish in the 12 great tanks, he gave security to birds.



Herd of elephants at the Uda Walvi National Park, PHOTO COURTESY OF LYN DE ALWIS.

In direct contrast to this was the kind of sanctuary that the British declared in 1909. They were “game” sanctuaries in which only game was protected for sportsmen to kill. Actually, by the twelfth century, Sri Lanka had reached the zenith of her prosperity as an agricultural nation. She had been referred to as “the granary of the East.” By this time Sri Lanka’s population, though not 20 million as some historians suggest, was “exploding” in the face of prosperity. To have succeeded in transforming natural ecosystems into a comprehensive agrosystem meant that people practiced stringent water and soil conservation methods. The clever King Prarkrama Bahu who reigned in A.D. 1153 decreed that “not a single drop of water received from rain escape into the sea without being utilized for human benefit.”

The irrigated agricultural land became the centers of dense populations and perhaps the abode of royalty, state officials, and feudal lords. But outside city limits and the sanctuaries the land was mostly forest. On the fringes, rural people lived in self-contained villages. It is here that we can trace the essence of sustainable living—a concept that the West is very magnanimously trying to educate the East in, so many centuries later.

Outside the sanctuary limits, forests fell into two main categories—crown forests and wastelands. Crown land was, as the name implies, forests belonging to the king and into which only royalty had access. Wasteland was unprotected forests where people practiced “slash and burn” or shifting agriculture.

The status quo of sanctuary, crown land, and wasteland may have sufficed when the old kingdoms were established in the flat lowlands of the country. But after the thirteenth century, waves of foreign invasions, mostly from India, and recurring epidemics of malaria drove the Sinhala kings into the salubrious highlands, an environment unfamiliar to them.

As more settlers moved into the hill country, more forest had to be opened up. This called for more planning in land utilization, which was accompanied by appropriate soil and water conservation techniques.

Their success paved the way for another golden age in Sri Lanka's history—the rise of the Kandyan Kingdom in the hill country. As soon as agriculture moved into the hill country, the crown forests were further categorized into royal forest, forbidden, or sequestered forests, and were used for defense and other purposes.

The royal forests virtually surrounded the royal palaces and were the preserve of the king. No commoners were allowed entry. For example, one of these forests survives today in Udawattekele, which is situated above the palace of the last king of Kandy, behind the Temple of the Tooth.

Equally well protected were the forbidden forests (Sinh. Thahansi kale), which were invariably dense evergreen forests that contained streams and rivers. These were the first wilderness areas to be protected for ecological purposes. Colonial rulers on the rampage from the seventeenth to the nineteenth centuries cleared the magnificent forests of the hill country. They respected a few of them, thus some of these forests survive today as protected wilderness areas, although their size is drastically reduced. The Sinharaja (Rain) Forest, the Peak Wilderness, the Maha Eliya montane forests (subsequently renamed Horton Plains after a British governor) are some of the better-known Thahansi kales. All these wilderness areas were actively protected by paid kale *korales*, the equivalent of today's forest rangers.

The Colonial Period

At the turn of the sixteenth century ruthless Portuguese armies arrived. The invasions, which began in 1505, bolstered by arms and ammunition, made short work of the Sinhalese defenses and quickly captured the maritime provinces. Though they plundered the natural wealth of the country and exported it by the shipload, they didn't wipe out the forests. But their devastating elephant capture operations and wildlife killings left the country stunned.

After 150 years, the Dutch made their aggressive appearance, vanquished the Portuguese, and decided to stay for 150 years. Being a maritime power, the Dutch concentrated on the coastal areas, strengthening the trade activities of the Dutch East India Company. They moved into the hinterlands only to plant cinnamon and other spices, which were valuable commodities at that time.

Among the colonial powers, the British did the most damage to the wilderness areas, regardless of their protected status. Apart from their single-minded desire to subjugate the people, they set about planting economical tea and rubber crops for which the lush forests protecting the hill country were systematically annihilated.

They heartlessly dispossessed the people of all their land and completely destroyed the very essence of life in this blessed country. At one point, the British laid absolute claim to 95 percent of the land. The crown forests of the Sinhala kings were subtly changed to crown land under the British Crown.

Not only did they usurp all village land, they also introduced a culture of violence toward wildlife. Then came the roads into the hill country whose construction was described by Karunaratne in his work *Udawattekele*.

As the years went by many more roads were opened up in the hill country, often passing through former royal sequestered forests, with the advent of the coffee industry more and more acres of virgin jungle clothing the mountainsides disappeared before the planters' axe.

So the Asian concept of conservation through sustainable use of natural resources disappeared, at least in this country, through the ignorance and/or greed of the colonial rulers. When the need for

conservation became necessary, the British returned to a draconian culture of controls, laws, and punishments, which destroyed people's participation in protecting the land. To this day, even after fifty years of independence, rural people cannot comprehend the change.

The curator of the Royal Botanic Gardens at Kew, Dr. J. Hooker, got the governor to stop the senseless destruction of forests in Ceylon (Sri Lanka). This observation led the British administration to formulate a Forest Act in 1885 and a Forest Department in 1887, with the intention to slow down the overexploitation.

Even this noteworthy step did not do much good for wilderness protection because the act only regulated forestry activities that brought more revenue to the government. Forests were not considered to have ecological importance to agriculture or to soil and water conservation. As was customary, wildlife came within the purview of the Forest Department. But in those early days the Forest Ordinance paid scant respect to the animals, their protection, or their needs. Having ransacked the hill country and driven its fauna into the inhospitable dry thorn scrub and monsoon forests of the lowlands, some energetic British marksmen banded themselves together and formed the Ceylon Game Protection Society in 1894. Even though their intentions may not have been altogether altruistic, the society did agitate for the introduction of laws to protect their targets ("game") such as elephant, buffalo, deer, leopard, and bear. The efforts resulted in the first piece of legislation to protect "game" in "game sanctuaries" through the Game Protection Ordinance of 1909. Much to the chagrin of the Forest Department hierarchy, the government entrusted the task of administering the ordinance to the selfsame society. This is perhaps the first time that wildlife was privatized.

Sri Lanka's first warden of wildlife, Mr. C. W. Nicholas, reported in 1951 the history of wildlife conservation. He stated that after the Great War of 1914 to 1918,

cheap, single-barrel breech loading shotguns were imported [into Sri Lanka] in large numbers, motor car headlights and electric torches began to be used to facilitate the shooting of animals on and off the roads at night, and the slaughter of wildlife reached such proportions that an Ordinance to amend the Game Protection Ordinance was introduced in the Legislative Council in 1926.

A new era for wildlife dawned after 1930 when Sri Lanka adopted the new Donoughmore Constitution, which allowed local members of the State Council to hold Cabinet portfolios. To our good fortune, nature conservation (forests and wildlife) came under the minister for agriculture and lands, Mr. D. S. Senanayake, who became independent Sri Lanka's first prime minister. An epochal change occurred when the Game Protection Ordinance was replaced by the Fauna and Flora Protection Ordinance on March 1, 1938. On that same day Sri Lanka's first two national parks came into existence, namely Yala and Wilpattu.

Conservation in Independent Sri Lanka

Although Sri Lanka only gained independence in 1948, Britain appeared to be losing its grip on colonies like India and Ceylon long before that, as it was fighting a world war. This enabled the more enlightened citizens, backed by the Game and Fauna Protection Society, to press for more reserves and also to give autonomy to wildlife protection. The latter was achieved in part by creating the post of deputy warden who was in charge of wildlife protection under the Forest Department. The conservator of forests was



Silhouettes at sunset in Dry Zone Wilderness. PHOTO COURTESY OF LYN DE ALWIS.

de facto warden of wildlife. This status quo continued until October 1, 1949, when autonomy came at last and a new department was instituted. The first full-time warden took office on December 1, 1950.

Several categories of protected areas were developed under the new ordinance. Two principal categories were defined: sanctuaries that gave total protection to wildlife but allowed human activity because the land was not necessarily state land; and national reserves that were on entirely state-owned land. The national reserves were subdivided into strict natural reserves, national parks, and intermediate zones.

The breakaway from the “big brother” (Forest Department) so soon after Independence proved to be giant step for the future of wildlife and wilderness protection. We were also unique among Asian countries, and the following benefits accrued:

- Better protection for the indigenous fauna, which until then foresters derisively referred to as “vermin”
- Better protection of forests (jungles) from timber extraction and other forms of exploitation. The wildlife department became the sole “owners” of its territories.
- More opportunities for scientific research and education
- Public access for aesthetic and emotional interaction with wild places and their inhabitants, which proved to be essential to resist political pressure on land from such reserves

Strict natural reserves provided protection to animals and plants and provided research opportunities. Only researchers were allowed into these hallowed portals. Core areas of the Wilpattu and Yala National Reserves were declared strict natural reserves, which benefited the fauna. Ritigala, a unique mountain massif in the middle of the dry zone, and Hakgala, a 1,980-meter peak clothed in montane forest, were declared to protect unique flora.

National Parks in Sri Lanka Share Similarities to Parks Elsewhere

Intermediate zones, ostensibly buffers between national parks and village forests, were open only to so-called sportsmen. If they were classified as buffer zones, in which no shooting was permitted, they may have survived by serving a better purpose.

It was not until the late 1950s that the department formulated a conservation policy. Field surveys, research, and scientific methods gathered momentum and resulted in the creation of more specialized national reserves. The most significant of these, the Jungle Corridors (or Link Forest), were reserved to mitigate the fragmentation of habitats, especially elephant habitats. In the 1964 amendments to the ordinance, Jungle Corridors entered the statute book, as did Nature Reserves. The first Nature Reserve was Horton Plains at an elevation of 1,980 meters and was a wilderness par excellence (today it has been elevated to the status of a national park, which is mostly accessible only by foot).

During my forty years of service to wildlife and wilderness (thirteen of them as director of wildlife conservation) and in my dealings with politicians, I had to shed my bureaucratic mantle and try to understand their anxieties. This is where my village background held me in good stead. By appreciating the politician's viewpoint, I was able to make him or her see the animals' viewpoint, so to speak. I was accused of being parochial, but I can say as an "elder" conservationist that unless one has a passion for the wilderness and the wildlife in it and considers the national reserves as being sacred, one has very little reason to care for them!

We have been able to save the wilderness areas entrusted to the department and have added to them. The recognition of Jungle Corridors and subsequently of buffer zones and refuges has increased wildlife habitats from 10 percent of the country's forest cover in 1950 to 12 percent today. This constitutes 50 percent of total forest cover in the country, a fact of which the Forest Department is somewhat envious.

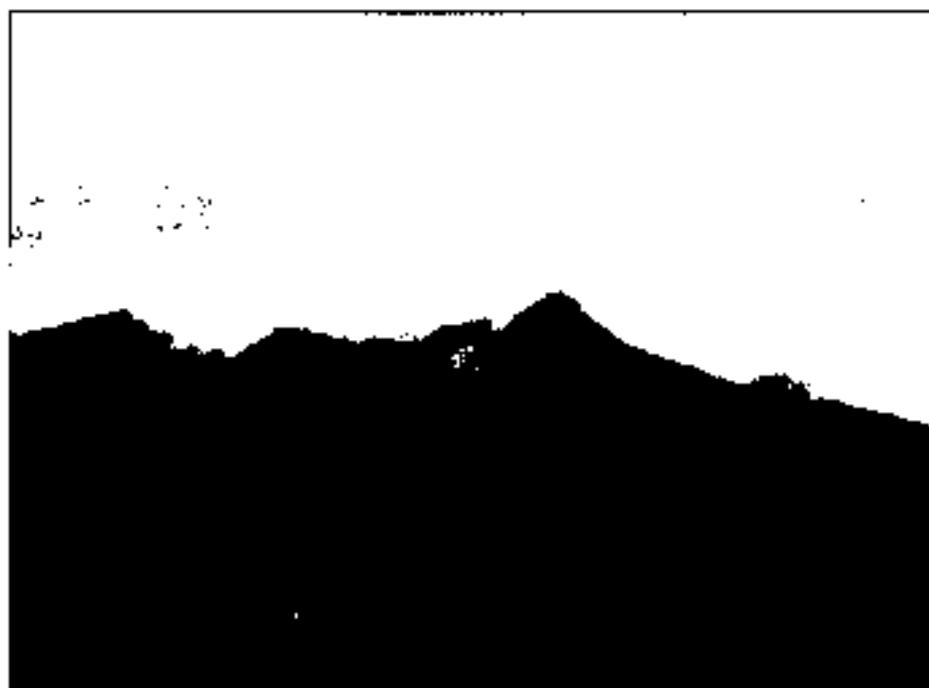
Today, the department looks after a total of seventy protected areas covering an area of some 336,178 hectares. In addition, the Forest Department also takes care of seventy-three protected areas with a total of 65,500 hectares. Today Sri Lanka has a **National Heritage and Wilderness Act** by which those listed therein are inviolate. This act, passed in Parliament in 1987, is of great relevance today.

What about the Future?

Our approach to conservation must experience a paradigm shift. The shift is a choice between forging a partnership with the people whose lives are most affected by wildlife—whether it be conflict or cooperation—or perpetuating the fallacious thinking that humanity is superior to all beings and continue with senseless human-made confrontation with animals. I have shown that Sri Lanka is an agricultural country and that the conservation practices, which enabled the smooth transition from ecosystem to agrosystem, were absolutely correct. The pseudoscientific attitude toward problems caused by conservation methods originating in industrialized countries will never solve our problems.

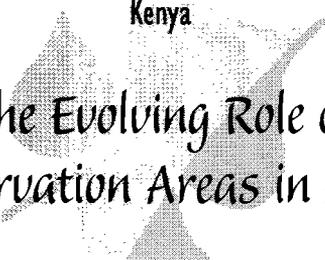
Laws, controls, and a police officer's attitude widen the gap between stakeholder and administrator. So often, much of the land in reserves was actually wrested from the villagers' forefathers by a single stroke of a colonial pen. Small wonder then that we cannot expect or persuade "community participation" from people so wronged.

When I introduced the concept of buffer zones in the late 1970s, I wanted villagers to use the reservations for grazing cattle and collecting firewood and timber. That process might have allowed people to experience a sense of belonging. Alas, this process was aborted, but I hope the department will try again.



Peak Wilderness Sanctuary with Adam's Peak in the foreground (4,000 feet above sea level). Photo courtesy of Lisa J. Auer.

Today we live in the information age. I would like to see information being shared between politician, policy maker, conservationist, administration, and scientist. Unfortunately, the latter two are losing their credibility—the administrator through a lack of conviction and the scientist in whose presence the policy maker becomes fearful or suspicious. We must remove such barriers and learn to speak to one another for the good of wildlife and wilderness. That will create a correct path to the future. May that day soon dawn.



The Evolving Role of Conservation Areas in Africa

Walter J. Lusigi

In 1962 Noel Simons (in his book called *Between the Sunlight and the Thunder*) said,

Those who have not been privileged to see Africa's multitude of wild animals in all their former grandeur have difficulty visualizing how East Africa must have appeared half a century ago. A person whose previous experience has been limited to seeing a handful of animals behind bars will naturally be impressed by his first glimpse of half a dozen giraffes or a pride of lions in the Nairobi National Park, and may wonder why the conservationists are fussing.

This remark from Simons offers a backdrop for discussing wildlife in Africa today. Today remnants of former larger herds urgently need protection. When reviewing records of past naturalists and talking to the few surviving elders who witnessed the coming of the Europeans to Africa at the turn of the century, it is important to note that what strikes our generation as a wealth of wildlife would have appeared comparatively insignificant to them. What the Europeans described as large, must have been large indeed.

In the last three decades I have witnessed Kajiado District of Kenya lose three quarters of its wildlife. In 1972 when I started work there as habitat ecologist, it usually took us three hours to drive from Nairobi to the Tanzanian border town of Namanga. The journey was slow but an adventure through animal traffic. One had to literally drive through thousands of herds as they traveled across the rolling Athi Kapiti plains. Today, the same trip takes about the same time but through human traffic, as there are no visible signs of wildlife. The whole route is now dotted with human settlements. The Athi Kapiti plains have been settled, and Nairobi and Amboseli National Parks, which were once joined by a corridor of wildlife herds, are now islands of what will soon resemble outdoor zoos.

Africa is experiencing an environmental crisis. Developments on the continent over the last three decades have decreased wildlife habitat and threaten the survival of the former migratory herds that have characterized the African landscape for centuries. Wildlife habitat is giving way to agriculture and urbanization in the face of increasing human pressure.

Accompanying poverty erodes basic human values for conservation and breaks down the social structure of society, which has always favored resource conservation. This trend demands an urgent response of equal magnitude to responses during drought and other natural disasters. By looking at trends, the implications for the future of wildlife conservation in Africa can be surmised. To avoid generalizations, this discussion focuses on Kenya, which has much in common with other African countries.

Population Trends

Kenya's population is today estimated at over 30 million, one of the highest growth rates—3.3 percent. A population of 5.5 million was recorded in 1948, 8.6 million in 1962, 10.9 million in 1969, 13.5 million in 1975, and in 1985 a population of 20 million was estimated. Over 90 percent of the population live in rural areas. At the time of the last census in 1988, the average person was less than fifteen years old and accounted for over 50 percent of the total population. This is a general trend for many countries in Africa today.

With one of the highest population growth rates in the world and such a severely limited area of fertile soils, some districts have reached and some have exceeded their carrying capacity. In western Kenya, for example, it is estimated that with present population growth rates, as many as 8 million people must find nonagricultural employment or move away from the region by the year 2000. Only then will farms become economical and not deteriorate into low-level subsistence farms. Areas of marginal lands are being put under snatch crops. And due to the unreliable rainfall in these areas, people tend to occupy higher elevations on the slopes of hills, which invites soil erosion. No rainfall can mean a total loss of the crop. The general result of this form of agriculture, in these delicate areas, is to convert potentially good quality grazing land (for livestock or wildlife) into areas of lowered fertility, liable to experience water and wind erosion.

A situation exists in Africa today where land use interests such as agriculture, ranching, wildlife management, forestry, and water conservation—each of them valid and nationally productive uses of land—are in some instances in competition and often in conflict over large areas of the continent. Not only are various arms of government in disagreement or confusion on these issues, but this is compounded by the demand of the landless and increasing population, which are haphazardly realized in the absence of clear policies.

Planting snatch crops to secure an accessible food supply is an understandable practice, especially in marginal lands experiencing population pressures. People living in these areas are anxious to safeguard themselves against the prospect of famine and are perhaps unable to obtain revenues from livestock sales due to disease barriers of flooded stock routes. But in the national interest, there must be developed techniques of land management and systems of socioeconomic administration calculated to reduce (and eventually eliminate) agrarian malpractices.

The Socioeconomic Situation

Poverty is perhaps the biggest threat to conservation in Africa today. Most African countries have a modern sector where the patterns of living and working are similar to those of the developed countries, but they also have a nonmodern sector, accounting for the vast majority of the total population. In the nonmodern sector there exist patterns of living and working that are not only profoundly unsatisfactory but are also in a process of accelerating decay.

This discussion will focus on helping to alleviate the problem of the rural poor, because these are the neighbors of conservation or wilderness areas and the people most affected by their establishment. Although this does not in any way suggest that we neglect development in the modern sector, it does imply that all successes in the modern sector are likely to be illusionary unless there is also healthy growth (or at least a healthy condition of stability) among the millions of people who live in dire poverty and extreme hopelessness.

The condition of the poor is characterized by a breakdown in the social fabrics of society. The work opportunities of the poor are so restricted that they cannot work their way out of misery. They are underemployed or totally unemployed, and when they do find occasional work, their productivity is exceedingly low. Some of them have land, but often too little. Many have no land and no prospects of ever getting any and with unemployment, they drift to the cities. But there is no work for them in the big cities either and, of course, no housing. All the same, they flock into the cities because the chances of finding some work appear to be greater than in the village. Although population growth serves to further deteriorate the situation, the situation of these people was not always a hopeless one. At the turn of the century there is documentation that these societies were quite prosperous until the social structures were broken through war slavery. The solution to alleviating poverty cannot therefore be found in economics alone but also through restoring the social structure that has been destroyed. Conservation of wilderness areas, which are mostly located in rural areas, should concern itself with alleviating rural poverty in order to get good neighbors for conservation areas.

The primary need in this regard will be to eliminate unemployment of the rural poor by creating jobs through small-scale, rural agroindustries. The emphasis here must be on workplaces and not productivity, because for a poor person the chance to work is the greatest of all needs, and even poorly paid, relatively unproductive work is better than idleness.

There is also another danger that the African people, as the people in developed industrial economics have done in relation to toxic wastes of their factories, will adapt to a steadily deteriorating environment. In many parts of Africa where wildlife no longer exists, forests are gone, and erosion is on the increase, people no longer see these as environmental ills but as basic features of their changed environment to which they must adapt as best as they can.

Wildlife in such cases is looked at as a thing of the past. In such cases where people seem more preoccupied with survival than environment, there is need for strong governmental interventions to restore the linkages between people and their environment.

Civil Strife and Conflicts

Over the last three decades the situation in Africa has been unsettled. Various forms of conflict exist throughout the continent that are not only costly in terms of resource commitments and loss of human life, but are having a great impact on the social and cultural stability of many countries. All these factors have bearing on the conservation of natural resources, and especially wildlife areas. First the commitments to military expenditure far outweigh the resources being committed to essential targets like agriculture, health, and education and therefore serve to deepen the already desperate situation of poverty. It is difficult to think of conservation of resources without any alternative means for livelihood.

Secondly, the breakdown of families and social structures and the displacement of many people from their homes are perhaps the most far-reaching effects of these conflicts on conservation. Living in balance with nature is the backbone of African culture and social setting. The disruption of the family completely disrupts this basic social fabric of the African society, leaving a situation whose ultimate outcome is difficult to predict. The cultural basis for conservation is completely broken as large groups of people roam the continent as environmental refugees without any specific place they can call home.

Third, since the displaced people must have a livelihood, which is dependent on agriculture, they settle in the only remaining open spaces, and these many times are protected areas.

Fourth, the confusion that follows civil strife tends to favor opportunism whereby the temporary winners tend to take advantage of the loss of vigilance from conservation authorities to exploit wildlife resources for their trophies and short-term gains. Some of the protected area estates are excised for settlement or even sold to entrepreneurs for farming or mining.

In the case of alleviating poverty, conservationists cannot sit on the fence in light of all these events. They should be important participants in the peace processes. The idea of transfrontier peace parks is one innovation that seems most promising. If conservation areas can be the source of cross-border collaboration between African nations and can contribute to tourism, education, and research, there can be no better form of conservation-based technical cooperation.

Governance and Institutions

The issue of governance and the functioning of those institutions charged with the management of wildlife resources are major concerns to the future of wildlife resources. The issue of governance is related to the disruptions that occur during civil strife and political upheavals. The search for stable forms of government in many African countries has taken a bit longer than earlier expected. At the time of writing this paper there are various signs of instability caused by military, tribal rivalry, and other factors of institutional mismanagement.

Many governments are still military dictatorships. This means that informed modes of decision making, which would be a prerequisite for organized natural resources management, are largely lacking. This also means that new approaches being adopted and tried elsewhere in resource management have hardly even been considered in most of the situations. The priority of military-based governments is obvious, and a great part of their budgets is channeled toward the military.

Institutions charged with looking after wildlife resources tend to be weaker than the other institutions, both in terms of personnel and budgets. This has the natural effect of weakening the needed supervision of wildlife activities in the field. But sometimes it is not quite the issue of budgets because in some countries wildlife resources have earned adequate revenues, but these revenues are not usually used for conservation. Apart from the issue of appropriation, there is the issue of mismanagement and corruption. Mismanagement sometimes results from the lack of well-informed management capacity, whereas corruption results from the lack of discipline and commitment of government officials. This is in turn the result of lack of accountability both in the traditional and the modern sense. This situation can only be corrected through disciplined and committed leadership.

Future Directions

Although the situation may seem grim, it is by no means hopeless, as imaginative policies implemented by a new generation of committed and sincere leadership could still help the situation. In some countries where conflicts have decreased and new dynamic leadership has emerged, as in Ghana and Uganda, there is considerable recovery of some wildlife populations, and the reconstruction effort of the economy is starting to show some results. There have also been several innovations attempted on a small scale in different countries, for example Integrated Conservation Development Programs and biosphere reserves, which show a measure of hope but still need considerable support so they can take root in the systems. The following suggestions are made for a broader approach and are not a blueprint for all countries. These suggestions are conditional to good governance and peace.

1. Protected areas should be part and parcel of the land use plan of the region in which they are located and their contribution to the whole environment both ecologically and economically should be recognized.
2. Protected areas (especially national parks) should be centers in a mosaic of various land uses. Radiating from the park at the center, with its policy of minimal influence from humans, should be possible concentric zones of increasingly more intensive subsistence and commercial activities.
3. The major use in national parks and similar protected areas should remain that of providing a home for the wildlife, with controlled tourism and local game viewing. This home should be maintained in the ecologically healthiest form possible, and this will mean management measures such as population control through cropping and prescribed burning. Resulting meat from such control work should be given to the surrounding populations.
4. In a progressive manner, the zones surrounding the protected area should possibly be multiple use areas, with use activities being less intensive at the area closest to the park border and most intensive furthest.
5. Recognizing the low resilience of the faunal resource, activities immediately outside the protected area or park zone should give priority to wildlife perpetuation.
6. Development centers should no longer be built within the parks or protected areas. These should, as a general rule, be located on the park periphery but at a comfortable distance from the local settlements, to avoid cultural pollution due to tourism. Structures must be built to blend into the landscape.
7. Priority for positions in the tourist centers and visitor facilities, and also in the park administration, should be given to the immediate community in which the park or the protected area is located.
8. The ecosystem in which the protected area or park is located should be clearly identified, and the family units located in it that would normally derive their livelihood from the resources of the protected area, should be appropriately compensated in various ways. Every family in the ecosystem should receive a cash income derived from park revenues and tourist activities in the area.
9. Where still possible due to abundance of migratory game, selective hunting by local tribes for meat purposes, controlled by protected area managers through their local administrative chiefs, should be allowed for the tribes in the ecosystem in the area outside the protected area. Gate fees should not be charged to local people who want to visit the park. Public transport should be made available by protected area authorities.
10. Although no reorientation will automatically guarantee success, wildlife policies reformulated along the principles of smallness, simplicity, and capital cheapness seem appropriate for the current circumstances in Africa. Permitting the selective use of indigenous techniques to harvest wildlife near villages will enable local residents to use their own traditional knowledge and skills to meet their subsistence needs and will reduce their dependence on the outside supply.

In addition to restoring a large degree of local autonomy, such policies may free government personnel for the more important roles of monitoring environmental quality and providing education.

11. The existing national parks and protected areas given an illusion of faunal security but are inadequate to serve the purpose for which they were created. This is particularly true in regard to preserving representatives of all indigenous species in their natural habitats. Africa's national parks and protected areas contain examples of little more than two-thirds of major mammalian species indigenous to the continent. The protected areas should therefore be extended through the above approach to embrace all areas of exceptional faunal significance.
12. In establishing new forms of protected areas in accordance with the above approach, the rights of members of indigenous cultures to the lands they have traditionally occupied must be recognized, and any plans must be developed in consultation and in agreement with the people involved. These ideas are neither revolutionary nor new, but conservationists who like to see protected areas in neat packages are reluctant to apply these ideas. Any further reluctance to integrate protected areas in the landscape in Africa will be a sure road to their total elimination.

Current and Future Prospects for Wilderness in Namibia

Trygve G. Cooper

The Republic of Namibia is situated on the southwestern coast of Africa, between the Atlantic Ocean on the west, and Botswana to the east. Its northern neighbor is Angola, its southern the Republic of South Africa. It is roughly twice the size of California, or about the size of France, or one-third the extent of India. It has a human population of some 1.8 million people, about the lowest density of any African country other than Botswana.

Namibia is a place of immense vistas, contrasting terrain, and awe-inspiring natural beauty. It includes parts of the Kalahari Desert to the east, and lying along the entire length of its misty and wild Skeleton Coast is the oldest true desert in the world, the Namib, with some of the highest sand dunes on earth. The cold and nutrient-rich Benguella Current provides important marine resources such as fish and fur seals. In the south is situated the second-largest canyon in the world after the Grand Canyon in the United States, the hauntingly beautiful Fish River Canyon of some 60 kilometers in length. The majestic Baynes, Otjihipa, Hartmann, Zebra, and other mountain ranges are found amongst the broad plains and valleys of the northwestern Kunene Province, which includes the legendary Kaokoveld with its desert elephants. In the north, the immense Etosha Pan dominates the flat terrain within one of the more famous game parks on the continent. In stark contrast to the rest of Namibia, the northeastern landscape offers wetlands, reed beds, rivers, and swamps so characteristic of the Caprivi. Here, Zambia becomes another neighbor, with Zimbabwe close by. The Victoria Falls are a short drive away.

Some fifteen ephemeral rivers snake their way through the arid terrain of the pro-Namib and Namib to where their waters very occasionally reach the Atlantic coastline. Elsewhere, a few other equally dry watercourses are found in the south or wending their way through the Kalahari and eastern sandveldt. Apart from these very majestic but normally dry linear oases, only a few perennial rivers exist in Namibia, and mostly along the national borders: the Kunene, the Kavango, the Kwando/Linyanti/Chobe and the Zambezi in the north, and the Ghariep, formerly known as the Orange, in the south.

The capital city, Windhoek, is situated in the central highlands known as the Khomas Hochland. Not surprisingly, in such a dry country, Windhoek recycles more of its precious water than almost any other capital city in the world, but with urbanization, the process remains a never-ending battle.

The twenty-one parks and recreation areas that Namibia has proclaimed represent thirteen biomes and cover 13.6 percent of the total surface area of 824,295 kilometers² of the country. Thus, proclaimed conserved area amounts to some 112,104 kilometers², or 11,210,400 hectares. The largest park, Namib Naukluft, covers more than 4.9 million hectares or 49,768 kilometers², most of which is pure desert. By comparison, the Skeleton Coast Park is 16,390 kilometers², the Etosha National Park is 22,270 kilometers², and Waterberg Plateau Park is 405.9 kilometers². Up to 500,000 tourists visit Namibia annually; the main attractions are the scenery, pristine environment, wide-open spaces, and wildlife. Tourism is the

fastest-growing industry and currently the second biggest earner of foreign exchange after mining—well ahead of even the agricultural and fishing industries.

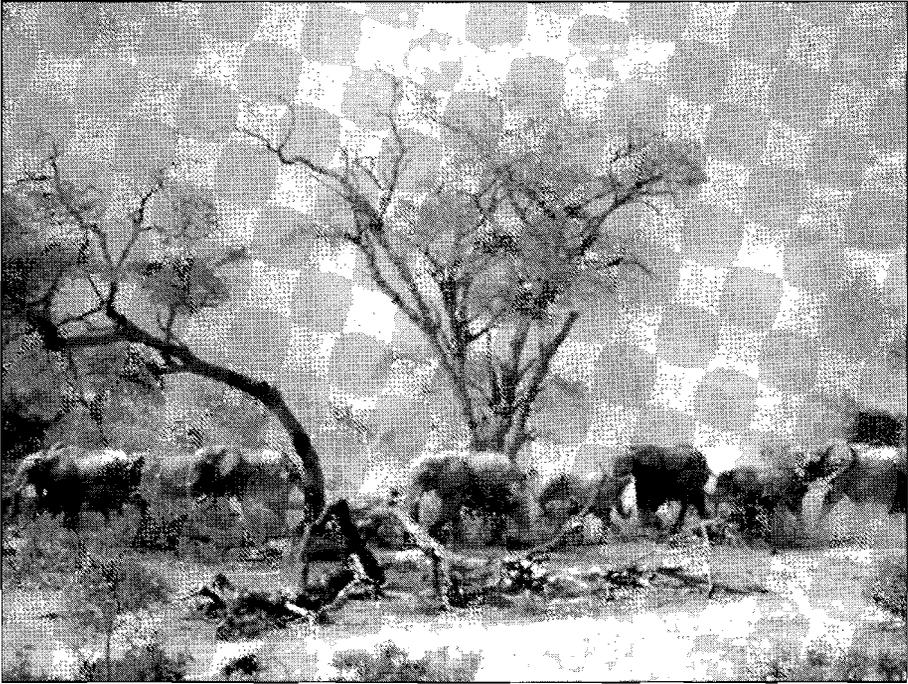
At Independence, declared in 1990, Namibia became an example to the entire world when it included Article 95 of Chapter 11 in the constitution. This article states that

the State shall actively promote and maintain the welfare of the people by adopting policies aimed at the maintenance of ecosystems, essential ecological processes, biological diversity of Namibia, and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future; in particular, the Government shall provide measures against the dumping or recycling of foreign nuclear and toxic waste on Namibian territory.

Namibia has acceded to several international treaties, including the Convention for the Protection of the Ozone Layer; the Convention on Wetlands, or the Ramsar Convention; the Basel Convention dealing with transboundary movement and disposal of hazardous waste; the Convention on Climate Change; the 1992 Rio Summit Biodiversity Convention; the Desertification Convention; and the Convention on International Trade in Endangered Species. Besides nonconsumptive ecotourism, policies allow for and govern sustainable utilization of natural resources such as trophy hunting and game farming, and the establishment of conservancies on communal as well as on commercial land; an Environmental Impact Assessment policy is also well in place.



Fish River Canyon, Namibia. PHOTO BY DIRK HEINRICH.



Elephants in the Hoanib River Valley, Namibia. PHOTO BY DIRK HEINRICH.

Namibia provides a home to several environmental organizations, including to the Africat Foundation, the Cheetah Conservation Fund, the Desert Research Foundation, the Integrated Rural Development and Nature Conservation, Namibia Animal Rehabilitation, Research and Education Centre, the Namibian Business Forum for the Environment, Namibia Centre for Holistic Resource Management, Namibia Evolutionary Ecology Group, Namibia Environmental Education Network, Namibian Greenspace Project, Namibia Nature Foundation, Rössing Foundation, Save The Rhino Trust, University of Namibia Environmental Society, the Wildlife Society of Namibia, World Wildlife Fund (Namibia), the Namibian branch of Earthlife Africa, the Namibian Black Rhino Fund (operated by Save the Rhino International), the Conservancy Association of Namibia, the Namibian Professional Hunters Association, the Namibian Wilderness Association, and the Youth Conservation Corps. The Ministry of Environment and Tourism controls environmental legislation and policy implementation nationwide. Plus, Namibia is blessed with an extremely environmentally aware and supportive leader—His Excellency the State President Dr. Sam Nujoma.

While Namibia may be one of Africa's environmental leaders, only recently have wilderness issues been debated. Understandably, much of Namibia is still *de facto* wilderness, and the necessity for legalized proclamation of wilderness areas has not until recently been felt. However, as we all know, even within the vast proclaimed parks of this world, wilderness is under threat, and Namibia will not be an exception. Even the best-intentioned tourism and other management demands continue to make irreversible inroads into the last silences, and one wonders where it will all end. There is a growing feeling in Namibia both within the public and the private sector that, unless awareness is cultivated that would lead to legal entrenchment and protection of wilderness zones, then even the great parks of Namibia will lose much of their character and attraction in the future. In the case of Namibia, those who lobby for wilderness do not seek to wrest

more land from the people, but rather to push for the setting aside of wilderness areas within the existing parks as a start. If we set the example and display the benefits and wonderful uses to which wilderness can be put, then we may in time have candidate wilderness areas on communal and private land being suggested by the citizens themselves, but that must come from the people if they so desire. Wilderness areas do not confront but rather complement other forms of wise land stewardship such as conservancies, and sustainable use of natural resources such as hunting.

In Namibia, the wilderness effort officially started in 1984, when the western half of the Waterberg Plateau Park in north-central Namibia was set aside as a wilderness area, encompassing 19,000 hectares of the total park size of 41,000 hectares. Waterberg is a sanctuary for rare and endangered species in Namibian terms, where animals such as black and white rhino, Sable antelope, roan antelope, disease-free buffalo, tsessebe, and eland are managed in order to restock areas where they formerly occurred. In spite of such a specialized management goal with all the game capture, translocations, monitoring, and protection measures that accompany it, the fact that half the park was declared wilderness does not detract from management efficiency. On the contrary, wilderness status forcing us to conduct most monitoring and antipoaching patrols on foot and on horseback has probably enhanced the standard of these activities and our knowledge of the area.

In 1985 extensive reconnaissance of the wilderness was conducted on foot and on horseback, and suggestions for utilization were incorporated in the management plan. Two Trails Camps were sited on the edge of the wilderness area. The first Wilderness Trail was conducted in May of 1986, and 132 trails followed over the next eight years. In 1993 Dr. Sam Nujoma, president of the Republic of Namibia, visited the Waterberg to welcome and thank volunteer Raleigh International venturers tasked with the building of the third Trails Camp.

In 1994 Vice President Al Gore of the United States visited and walked in the Waterberg Wilderness Area. In 1995 the Youth Conservation Corps of the Ministry of Youth and Sport undertook a voluntary long-term program stretching over three years for unemployed Namibian youth, involving the reconstruction of the two original Trails Camps.

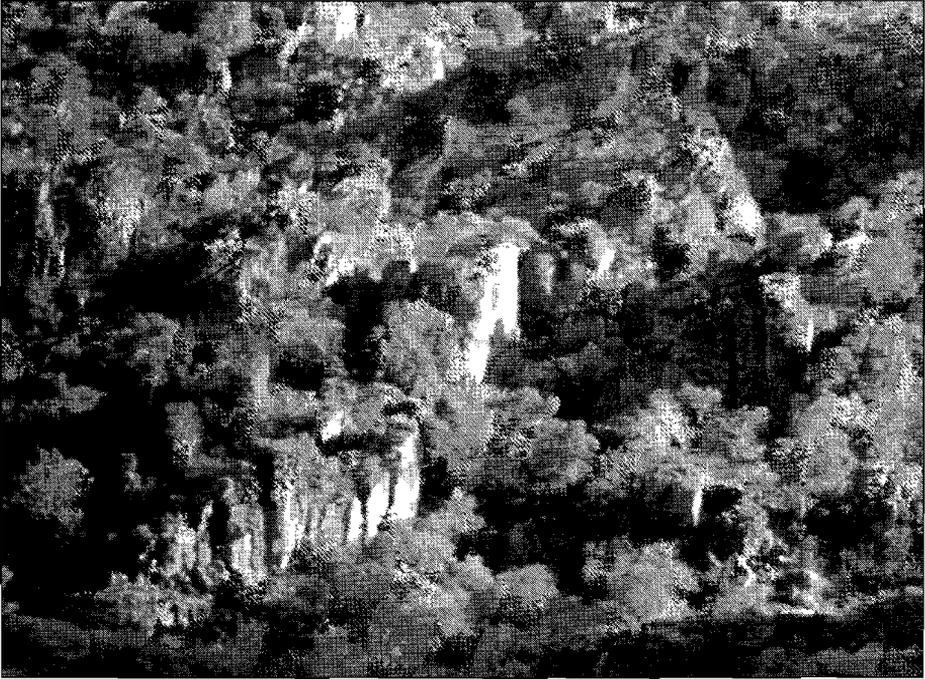
In 1996 the first international Wilderness Management Symposium on the African continent outside of South Africa was hosted at the Waterberg Plateau Park. Over 100 participants were present from eight countries. Immediately following this event, the Wilderness Action Group of Southern Africa held the first Basic Wilderness Management Training Course for rangers and wardens of the Ministry of Environment and Tourism (MET). In 1997 additional basic and advanced Wilderness Management Training Courses were held at Waterberg.

In 1998 third-year students at the Polytechnic of Namibia—pupil wardens taking their Nature Conservation Diploma—attended a three-day Wilderness Trail at Waterberg. This is now an established part of the curriculum for final-year students.

The Namibian Academy for Tourism and Hospitality (NATH) has sent aspiring field guides on three Wilderness Trails at Waterberg, to be followed by a five-day wilderness-oriented Field Guide Training Course in the park. This is now a compulsory course for students wishing to obtain their Field Guide Badge with NATH.

The fourth Trails Camp was completed on the edge of the wilderness area. To date, over 200 three-day Wilderness Trails have been held at Waterberg for some 1,400 people over a period of twelve years.

A third basic and a second advanced Wilderness Management Training Course were facilitated. In 1998 several groups were included—the MET staff, members of the public, and nongovernmental organization (NGO) representatives working with rural communities and communal-area conservancies with



Waterberg Wilderness Area, Namibia. PHOTO BY DIRK HEINRICH

a potential for establishing wilderness and diversifying tourism opportunities. A total of fifty-nine Namibians, mostly MET staff, have undergone Wilderness Management Training Courses over three years.

In July 1998 the Wilderness Action Group facilitated a two-day Wilderness Information Workshop for a total of thirty-three attendees including MET staff, members of the public, NGOs, Waterberg Conservancy, the regional governor's office, and the press. Immediately after this workshop on July 19, 1998, concerned participants met to form the Namibian Wilderness Association to network on wilderness issues, disseminate information, educate, and fund raise for wilderness training, and generally further wilderness issues to the benefit of all Namibians.

Ms. M. Kapere, our director of resource management in the Ministry of Environment and Tourism, hosted a meeting in Windhoek with course facilitators of the Wilderness Action Group from South Africa and the United States, to become more informed about wilderness issues.

In July 1998 at the Daan Viljoen Game Park near Windhoek, Senior Warden T. G. Cooper and Namib's regional scientist Dr. Hu Berry delivered a presentation on wilderness history, principles, protection, management, and training to the regional meeting called by the deputy director of the central and southern regions. Mr. Haindongo is supportive of wilderness and is keen to initiate wilderness zones in parks under his control.

In late 1998 Raleigh International and the Youth Conservation Corps joined forces to complete reconstruction of the older Trails Camps, with overseas and local business financial support. Finally, the first issue of *Namibian Wilderness*, the newsletter of the Namibian Wilderness Association, has just been released, and public response is extremely encouraging.

Namibia is the first African country to have Wilderness Management Training as one of the officially accepted, annually available, and routinely presented courses within the conservation body of a state, although we have to seek financial support to hold them each year.

Namibia does not have specific wilderness legislation as yet, and the only recognized and administratively proclaimed wilderness area is that of the Waterberg Plateau Park, where Wilderness Trails are regularly conducted. The immediate goals are to establish wilderness zones within the other parks and to seek proper legislation to safeguard wilderness at the highest level. Our Nature Conservation Ordinance is being rewritten, and many hope that wilderness will be included as a specific category in the new act. In October 1998 a document strongly proposing legal entrenchment and zonation of wilderness areas was under scrutiny at a high level within the Ministry of Environment and Tourism.

The interest and support for wilderness conveys the message that Namibia is concerned about preserving some of its wild and unaltered landscapes for generations to come. Remaining areas need to be identified, proclaimed, and wisely managed in order to ensure that Namibians of the future inherit a reasonable quality of life.

An Update of the Status and Prospects of Wilderness Areas in South Africa

William R. Bainbridge

This paper considers the wilderness areas of South Africa as a component of the national protected area system, summarizes the history of wilderness conservation in South Africa, outlines the present status, and considers some of its values and future prospects for the national wilderness system.

The National Protected Area System

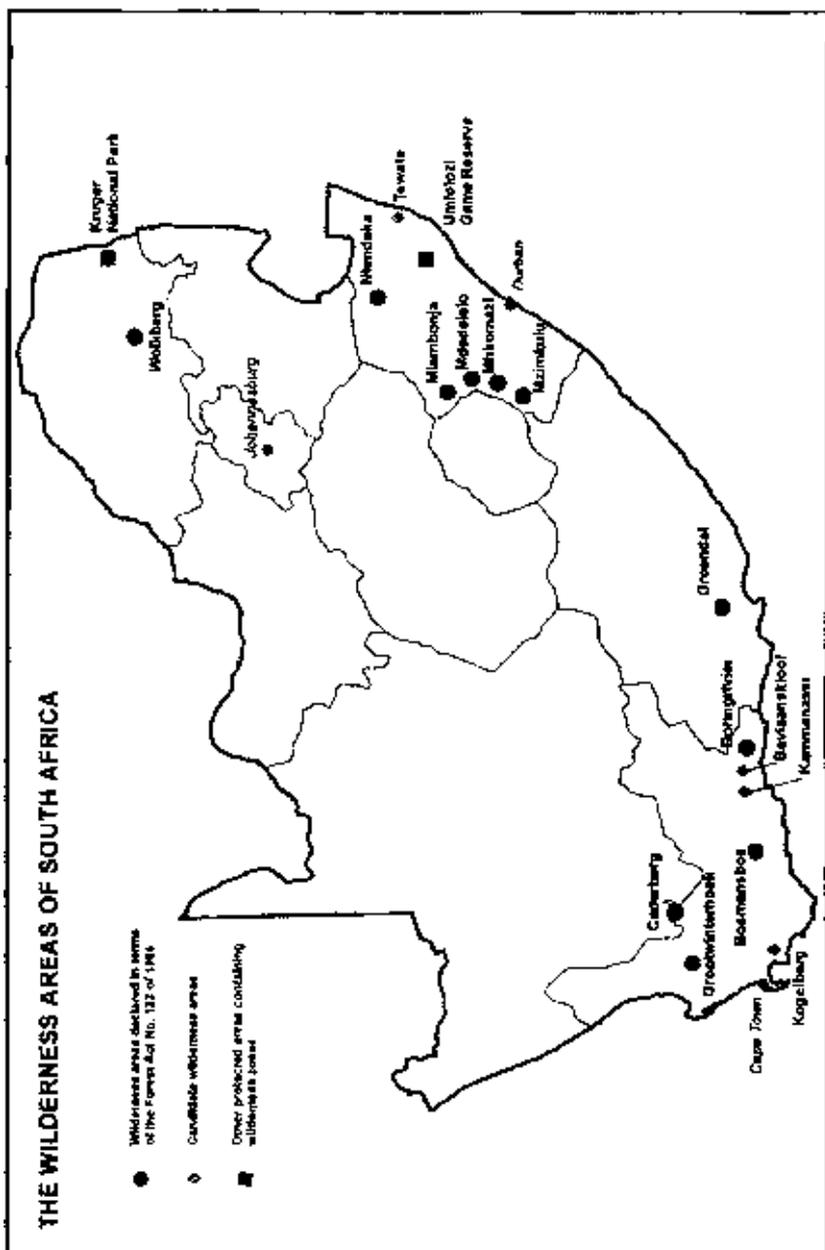
The government of the new South Africa has inherited what is probably one of the best-managed protected area systems of the developing world. This system provides South Africa with the authority to take a leading role in international efforts to conserve biological diversity, one of the global imperatives emphasized by Agenda 21 of the United Nations Convention on Environment and Development, 1992. Some of South Africa's parks generate substantial economic benefits by attracting a relatively large number of tourists, including substantial numbers of foreign tourists who bring foreign exchange into the country. Wildlife tourism is expanding and appears to offer exciting prospects that create urgently needed employment opportunities and diversify the economic base. Finally, tourism tends to have less damaging environmental impacts than most of South Africa's other major industries.

While the wilderness areas of the country are relatively small in relation to the greater protected area system, they are also of high quality and have been extremely well managed. Despite their relatively restricted extent, they nevertheless play a very important role in fulfilling vital functions such as water production and conservation of extremely important natural communities. In addition, they provide specialized forms of outdoor recreation, nature-based tourism, opportunities for renewal of cultural identities, and spiritual experiences that may not be available in other protected areas.

A Summary of the History of Wilderness Conservation in South Africa

South Africa is the only country on the African continent that has followed the World Conservation Union Commission on National Parks and Protected Areas system of protected area categories. And in 1996 it included Wilderness Area (WA) as one of its seven protected area categories.

The history of wilderness conservation dates back well before 1996, however. The Umfolozi Wilderness Area was designated as a wilderness zone within the Umfolozi Game Reserve (now the Hluhluwe-Umfolozi Park) by administrative arrangement in 1958. In 1973 an amendment was made to the Forest Act of 1968 at the behest of Danie Ackerman, then secretary for forestry, to enable WAs to be legally designated in



state forests. The first WA to be legally designated in terms of this legislation was the Mdedelelo WA in 1973. Since that time, a total of twelve WAs have been designated, with a total area of just under 341,000 hectares. In addition, a number of candidate areas, including a further 86,500 hectares of state forestland, have been proposed for designation as wilderness. Nearly 715,000 hectares of land with wilderness character within other protected areas have been identified for designation as wilderness zones.

The national protected area system boasts of a total of 422 protected areas covering some 7.73 million hectares, or about 5.5 percent of the country. Thus, WAs comprise only 2.8 percent numerically of the designated protected areas, and their extent represents only about 0.5 percent of the entire protected area estate.

The Forest Act is part of national legislation, and in the 1970s and 1980s it provided a higher degree of legal entrenchment than that enjoyed by provincial legislation. This included a series of nature conservation ordinances applicable to individual provinces, in terms of which the provincial protected area system was designated.

This arrangement has been criticized for several reasons. The provision under the Forest Act for the protection of wilderness on state forest was useful in that it enabled the designation of some extensive areas of land with true wilderness character and provided secure legal protection for these. However, the legislation was (and is) only applicable to state forestland and could not be employed for other areas.

In a similar vein, the National Parks Act has historically provided more secure legal entrenchment for protected areas designated as national parks than the legislation protecting provincial reserves. While the act has provided strong legal protection for the extensive national park system, some of which are large by South African standards (e.g., Kruger National Park with 1.96 million hectares), much of which has wilderness character, the act does not specifically protect wilderness character, and makes no specific provision for entrenchment of wilderness zones. An important aspect is that the National Parks Act is not subservient to the provisions of the Mining Act, and thus the national park system is immune to the threat of mining. In contrast, the Mining Act takes precedence over the legislation protecting provincial parks and state forests, and these are not necessarily immune to the threat of mining.

Until recently, the provincial protected area system may, in some respects, be regarded as having been somewhat disadvantaged. Some important protected areas (such as the Greater St. Lucia Wetland Park) were designated under legislation that was less secure than that protecting the national park system, but in some instances, are certainly of equal if not greater importance. Also, no legislation has been put in place for the designation of wilderness in these areas.

The Situation up to the Present

Twelve areas were designated as wilderness between 1973 and 1986. In 1986 the government of the day decided to rationalize the national nature conservation program, and a number of functions and responsibilities relating to nature conservation were devolved from the national down to the provincial level. The portions of state forest on which commercial afforestation was practiced were separated from the natural areas. Extensive portions of the national forest estate that were managed for nature conservation and related functions (e.g., watershed management and the provision of public outdoor recreation) were transferred to the provincial authorities. Responsibility for the management of the state forest wilderness system was included in the functions devolved, and thus almost the entire state forest wilderness system was transferred to the custody of the provincial nature conservation services.



Cape buffalo. PHOTO COURTESY OF BILL BAINBRIDGE.

This decision had important implications for wilderness management in South Africa, in that inter alia it can be argued that this move provided these organizations the opportunity to consolidate expertise in wilderness management. Expertise in wilderness conservation already existed in organizations such as the Natal Parks Board (now KwaZulu-Natal [KZN] Nature Conservation Service), and these teams were strengthened by the transfer of staff members who had been responsible for the management of the state forest wilderness system.

The transfer of responsibility for management of the state forest WAs did not involve changes in their legal status. Their designation remained within the provisions of the Forest Act, and thus their secure legal entrenchment remained unchanged.

No changes to the national system that had been designated up to 1988 had taken place at the time of the elections in 1994. That is, no areas have lost status, but equally, no new areas have been designated, despite strong requests for legal status to be given to important de facto wilderness areas that were previously identified as candidate areas.

Assessing the Values of Wilderness Systems

The present system is a major national asset. In the new South Africa, which is characterized by a heterogeneous society and an emerging economy, it is difficult, if not impossible, to generalize on popular perceptions about wilderness conservation. It is likely that the majority of southern Africans neither know nor understand the meaning of the word *wilderness* when referring to a protected area category, and therefore have no notion of the need for or values of the national wilderness system. It is important to demonstrate that these areas play a vitally important role in the protection of the national natural resources and have important functional, intrinsic, and social values.

Wilderness experts stress that wilderness should be managed as a composite resource, not as separate parts, because while many wildland resources such as timber, forage, and water can be appraised for their monetary values, others, especially wilderness, cannot be appraised in this fashion. The 1998 the Kumleben Report stated "that protected areas are of indirect economic value for the very reason that they do not exist for their intrinsic economic value." While this is not disputed, it can be argued that areas set aside as wilderness perform functions such as the production of water, to which indirect monetary value can be affixed, and this should be considered.

Resource economists assess the total economic value of natural areas in terms of "use values" (direct and indirect), and "nonuse values." Direct use values refer to traditional material values for income earned through use of the resources or environmental assets. Indirect use values of resources and environmental assets relate to such functions as conservation of biodiversity resources and ecosystem health. Nonuse values refer to the intangible benefits, generally manifested as perceptions rather than tangible assets. Wilderness experience and the use of wilderness for spiritual purposes and healing are such intangible benefits.

A Summary of the Values of the South African Wilderness System

The wilderness system of South Africa, like global wilderness systems, is valued for all of the conventionally perceived benefits. The following is a brief summary of some of the perceived values of the present South African wilderness system, from the viewpoint of the Wilderness Action Group.

Experiential

Clinical psychologists and social workers have successfully used the wilderness systems in both the Western Cape and in KZN for rehabilitation and healing programs for young people who have been traumatized by internecine and political violence.

The Wilderness Leadership School has, in the past, organized awareness and experiential trails for many thousands of leaders and prominent persons from many countries and communities. It is currently also operating the National Opinion Leader Program which to date has involved 150 key political, community, and environmental decision makers. The program includes a wilderness experience component that enhances environmental awareness, which in turn provides members of both Parliament and the provincial legislatures with greater knowledge and skills. These leaders can then debate key environmental issues and evolve personal viewpoints independent of environmental advisors.

A parallel program called Imbewu ("planting the seed of environmental understanding") aims to empower talented black role models in nature and environmental conservation. The program has been in operation for almost two years and has already involved some 800 youths from disadvantaged communities and urban townships. Part of the training involves a four-day wilderness trail. Recently, senior "wise men" from various African countries were invited to participate in a five-day Imbewu storytelling workshop in the Kruger National Park.

Scientific and Ecological

The wilderness system, as part of the national protected area system, plays a significant role in the conservation of the following:

1. *Landscapes and scenic resources:* Some of the most important scenic resources in the country are conserved in wilderness areas. An example is the KZN Drakensberg, which has been



Mzimkulu Wilderness Area, Natal Drakensberg Park, South Africa. PHOTO COURTESY OF BILL BAINBRIDGE.

described as “one of the great natural spectacles of the African continent.” The scenic resources will form part of the motivation for World Heritage status for the Natal Drakensberg Park.

2. *Water resources:* A number of the designated wilderness areas conserve some of the most important mountain catchment areas of the country. This is very significant in a country where water supplies are a limiting factor to the industrial economy. Some examples of high runoff catchment conserved within wildernesses are in the KZN Drakensberg wilderness areas. These areas give rise to the most important rivers of the province and comprise the primary water-source area of the Tugela-Vaal Project, which exports water to the Witwatersrand complex of Gauteng Province, the industrial hub of the country; and the Cedarberg WA (see below) in the Western Cape, which protects the high-rainfall watershed areas of the Olifants River and supports an important irrigation scheme in the lower reaches of the river.
3. *Biodiversity resources, including endemic and threatened species:* The wilderness system conserves some of the most important biodiversity resources in the country, and includes at least three biodiversity “hotspots,” defined as areas with high levels of endemism and species richness that are under threat. Important WAs that protect “hotspot” areas in South Africa include the Cedarberg WA, which conserves a sample of the Cape Floral Kingdom; the KZN Drakensberg WAs, which conserve portions of the alpine and subalpine Drakensberg hotspot; and the WAs within the Greater St. Lucia Wetland Park, which conserve examples of the Maputoland-Pondoland hotspot.
4. *Wilderness resources:* There is great land hunger in South Africa. The rate of development is such that in the foreseeable future, no areas with wilderness character not currently protected by law will remain undeveloped or not be used for consumptive purposes. By the

new millennium, it seems likely that the only areas in which true wilderness resources will be secure will be in existing wilderness areas and in candidate areas (almost all of which are within designated protected areas) that have been identified for formal protection. It can be argued that the existing wilderness areas will acquire rarity value over time. Significantly, it would seem that as demand for access increases with population growth and increased standards of living and associated leisure time, the full brunt of demand for wilderness experience will have to be borne by the relatively few existing wilderness areas.

Incidentally, investigations undertaken to prepare nomination proposals for World Heritage Sites for the Greater St. Lucia Wetland Park and the Natal Drakensberg in KZN have indicated that this prestigious status is unlikely to be bestowed on portions of these protected areas that have been modified by physical development, such as tourism facilities. In the case of the Drakensberg Park, at least, the only sections that will qualify for inclusion into the core World Heritage Site will be the wilderness system designated over twenty-five years ago.

Spiritual

Different national cultures revere the spiritual values of wildernesses in their own individual manner, but there are many common threads. Programs such as Imbewu, referred to previously, foster this reverence for the land. It is likely that the spiritual values of wilderness will receive greater attention as urbanization brings greater numbers of people into the cities.

Economic

The Kumleben Board of Investigation found unequivocally that nature conservation as such can never be financially self-supporting. Wilderness areas, both internationally as well as in South Africa, are not managed for their use values. Their benefits are composed largely, if not exclusively, of nonuse values. However, the actual values to society make up the indirect values referred to earlier, such as the value of the water produced from them, the biodiversity resources they conserve, and their value as a primary tourist attraction.

The following two examples illustrate this point:

1. *The value for water production:* As indicated, a number of the WAs conserve high-altitude, high-rainfall mountain catchments. The four KNP WAs have a total extent of 117,300 hectares with a runoff of c. 750 mm. p.a. Total potential runoff is estimated at some 880 million mm. p.a. If it is assumed that 50 percent of the yield is used for the production of economic goods, and that the monetary value to end-consumers would be about U.S. \$1/mm., then the net monetary value would be in the vicinity of U.S. \$ 440 million p.a. Similarly, water yield from the Cedarberg WA would be valued at about U.S. \$215 million p.a. However, it is not national policy to levy charges for catchment management programs to end-consumers. It should be emphasized that the data on which these estimates are based is poor, and these values are provided for use as indications of value, not to determine real income. Further research to determine more reliable estimates should be considered.
2. *The value for tourism:* The role of tourist attractions played by the wilderness areas is primarily as indirect backdrop and existence values, but they are also valued for the specialized forms of outdoor recreation and opportunities for cultural and spiritual renewal.

While it is not possible to impute a direct value to the value of the national system, the KZN Nature Conservation Service estimates that the KZN Natal Drakensberg Park (of which the wilderness system forms about a half of the total area) attracted about 20 percent of the total number of tourists who visited the province last year, the value of which was estimated at about U.S. \$300 million.

A variety of community-based tourism initiatives are being established adjacent to most protected areas in the country to service tourists. These initiatives vary greatly and may range from craft markets, the sale of fresh produce, and the provision of accommodation. Such initiatives bring important employment opportunities to communities near protected area systems that may have few other employment opportunities. While some of the recent initiatives are showing considerable promise, the potential for community-based tourism in the vicinity of the protected area system is considered to be substantial.

Cultural

Interest in cultural values manifests in many different forms. Some rural communities are identifying with protected area systems as a means of celebrating, and in some instances, reviving their indigenous cultures. An example is the Khoisan Heritage Project, based close to the Tsitsikamma National Park and the Baviaanskloof WA. The Khoisan, the native people of that area, have lost much of their indigenous culture. The objectives of the project are to reestablish the Khoisan culture and to identify with the wild areas in which they evolved. The project includes awareness programs and the promotion of community-based tourism initiatives.

Education and Training

The range of educational programs includes those referred to earlier and to a series of other educational programs. For the past eight years the Wilderness Action Group, with the assistance of nongovernmental organizations (NGOs) and official nature conservation organizations, has organized annual training courses on wilderness management in both South Africa and Namibia for staff of the official nature conservation organizations and others. Recently, these courses have received international aid from the U.S. Forest Service. Significant numbers of junior and middle management staff members have received training during this period. It is believed that the courses have been material in maintaining management standards of the wilderness system. The courses, wherever possible, are held adjacent to a wilderness area. Following recent partnerships that are in the process of being formed with academic institutions in the United States and KZN Province of South Africa, plans are currently being formulated to expand the scope of these courses.

Quo Vadis Wilderness Conservation in South Africa?

Regarding public support for wilderness conservation in the new South Africa, the hard facts are that:

1. the wilderness concept is hardly understood or appreciated by the ordinary South African person in the street or villager; and
2. obtaining the support of the people, or more significantly that of their leaders, for the concept is at least as important (but probably more important) than legal protection for the long-term survival of wilderness conservation in South Africa.

Responsibility for the necessary action to remedy this situation lies with both the official nature conservation agencies as well as the wilderness-orientated NGO movements. Possibly neither are sufficiently active to meet the very large hurdle that lies ahead, but with justification, it can be said that the initiatives in place have to a considerable extent come from the NGOs. This is understandable in that wilderness conservation does not feature on the national priority list, and the official nature conservation agencies have experienced enormous pressures since the introduction of democratic government, but their apparent inactivity is not condoned.

In the view of the Wilderness Action Group, there is no question that it is in the public interest to retain the present wilderness system in its entirety, and whenever possible, to extend it. We are confident that a significant number of traditional leaders and politicians are supportive, but far greater effort is needed to nurture this support, and to meaningfully extend the support base.

The State of Legal Protection

As noted above, the minister of environment affairs and tourism established this Board of Enquiry to advise him on a number of key issues related to the organization of nature conservation in South Africa in the future. The board, headed by Mr. Justice Kumleben, published a report that contains a number of far-reaching recommendations. The board has accepted the present protected area category system. It has also recommended scientific appraisal of all existing protected areas and identification of those that qualify for the status of Nationally Proclaimed Protected Areas, which are considered to be a national asset and must be safeguarded against unwarranted alienation. It is recommended that a panel of experts conduct the appraisals and advise the minister. Should the recommendations of the Kumleben Commission be accepted, the most important protected areas in Categories 1 and 11 (strict nature reserves, wilderness areas, and national parks) in each province will enjoy the same level of legal entrenchment as do the present national parks.

It is understood that each provincial nature conservation agency will promulgate legislation for the protection and management of the protected area system under its control. This will include the redesignation of the existing wilderness system in terms of the new legislation, without loss of legal security.

According to the KZN Nature Conservation Service, it is envisaged that not only will all existing wilderness areas in KZN be redesignated in terms of the new legislation, but existing candidate areas, including portions of the Greater St. Lucia Wetland Park, will also be formally designated as wilderness area.

The Problem of Funding for the Wilderness System

The official subsidies provided to the official nature conservation agencies have declined significantly since the new political dispensation. By force of circumstance, the official agencies have had to curtail a number of programs. The consequences of this for the conservation of the national wilderness system are not clear, but the prognosis is less than optimistic. It is, however, clear that the situation poses a major challenge to maintain standards in the sound management of the national wilderness system. This challenge lies both with the NGOs as well as the official nature conservation agencies, but mainly with the latter.

Designation of New Wildernesses

No proposals have been publicly announced to designate any new wilderness areas, other than in KZN. However, as already indicated, in KZN and possibly elsewhere, it is planned to designate a number of new wilderness zones within existing protected areas. It would seem that this is likely to be the pattern in the future, as opposed to the designation of totally new areas as wilderness. The present legally designated wilderness system and the candidate areas are listed in table 1.

Conclusions

The national wilderness system of South Africa is a priceless natural heritage, of which its citizens, its government, and the official nature conservation agencies, which have been responsible for maintaining them in their present outstanding condition, may be justly proud. While of relatively restricted extent in relation to the national protected area system, the system conserves vitally important watershed areas and biodiversity resources of international importance. These are the only areas on public land in which true wilderness experience is available. The system has acquired an international reputation, because it includes the first wilderness areas to be formally protected on the African continent, and because of the high standards to which they have been managed. Considerable attention will be necessary from both the official agencies and the NGOs to ensure that the system receives appropriate legal protection in the new dispensation under consideration for the national protected area system, and that the high standards of management afforded the system in the past is maintained.

TABLE 1: List of Wilderness Areas in South Africa.

<i>Management Authority</i>	<i>Area Name</i>	<i>Area (h)</i>
<i>Areas designated under the Forest Act</i>		
KZN	Mdedelelo	27,000
	Mkhomazi	48,000
	Mlambonja	14,000
	Mzimkulu	28,300
DWAF	Ntendeka	5,200
NP	Wolkburg	17,400
WC	Cedarberg	64,400
EC	Groendal	21,800
WC	Boosmansbos	14,200
WC	Grootwinterhoek	23,600
EC	Baviaanskloof	66,000
WC	Doringrivier	11,000
<i>Wilderness Zones in Other Categories</i>		
KZN	Umfolozi	26,000
KZN	Lake St. Lucia, GStLWPK	5,000
KZN	Mkuzi	5,000
KZN	Mont-Aux-Sources	4,000
KZN	Tembe Elephant Reserve	15,000
NPB	Kruger National Park	672,200
<i>Candidate areas</i>		
KZN	Tewate, GStLWPK	9,500
KZN	Sodwana, GStLWPK	10,000
KZN	Marine Sanctuary, GStLWPK	11,000

DWAF—Department of Water Affairs and Forestry

EC—Eastern Cape Province

KZN—KwaZulu-Natal Province

NP—Northern Province

NPB—National Parks Board

WP—Western Cape Province

Italy

Wilderness between Towns and Cities— The Wilderness Concept and Its Philosophy in Italy

*The History and the Successes
of the Idea as a Conservation Principle*

Franco Zunino

Italy is one of the most populated countries in Europe. Its surface area is 300,000 square kilometers; its population is 58 million people. Its cities and towns are growing fast, due to increased birth rates and emigration from the nearby poor countries of Eastern Europe, Africa, and Asia. Every year, new houses are being built and old houses are abandoned. There are also many new factories and large commercial buildings. Roads, highways, railroads, power lines, and pipelines are dividing up the territory.

When traveling in Italy, one rarely sees scenery without a house or other human-made structure in it. Considering that fact, it may seem unbelievable that Italy has an increasing number of large wild animals.

There are golden eagles, vultures, and wolves living in the mountainous peninsula. There are brown bears and lynx, the latter of which are thriving after a reintroduction effort brought these animals back following a century of their absence. There are two chamois species, ibex, red deer, mouflon, and other hoofed animals.

These animals live in the remaining expanses of natural habitat and among humans in cities and towns. They also live in wilderness areas that are unique to southern and central Europe and within a few hours' drive of many Italian cities and towns.

Most of these wilderness areas have been established as national or natural parks such as Majella Mountain in central Italy, Pollino Mountain in the south, Val Grande in the pre-alpine mountainous region, Maremma Chapparral in the coastal hills, and Gran Paradiso in the northwest. However, the preservation of these areas' wilderness characteristics is not assured. National and natural parks are primarily established for animal protection, tourism, and job development, and not for habitat protection. In addition, there is little effort to set aside any other wild areas. Instead, more roads and hotels, picnic areas, and other tourist uses place tremendous pressure on Italy's remaining wild areas. In a few years, Italy's large wild animal populations may be living in a patchwork of small natural habitats and largely civilized lands.

If a wilderness preservation concept is needed in order to preserve the remaining large wild areas of the world, from the tundra to the African savanna, to the equatorial forests or deserts, a wilderness concept is also needed in order to preserve the remaining small wild and "ancient" places of southern Europe.

This big-spirited American idea, proclaimed by conservationists such as Henry David Thoreau, John Muir, Aldo Leopold, and Robert Marshall, must be spread all over the world. It must be understood and explained to people in countries like Italy, where the rich people of the world, with their style of life, are negatively impacting wilderness. Everyone must understand the importance of wilderness preservation.

For almost fifteen years, the Italian Wilderness Association has worked toward this goal. Finally, the idea has taken root, even despite hard opposition in the environmental world. Beginning with some small "stamps of wilderness" obtained through local public authorities, the association has helped create a system of Italian Wilderness Areas that are uniquely different from National or Natural Parks Areas.

The first real victory for the wilderness idea movement took place in Italy in 1992 with the establishment of the Val Grande National Park, which is the wildest area of the European Alps. This achievement provided an example of wilderness that people could experience and thereby appreciate the importance of preserving other wild areas.

The Italian Wilderness Association formed in 1985 to further the wilderness idea and share the conservation concept with others. This work helped establish the first official Wilderness Area in Italy and Europe: Fosso del Capanno, which is a small section of a larger wild and roadless valley. This area now includes Regional Forest Service lands and municipal public lands and is composed of 760 hectares, enclosing almost all the remaining roadless area.

In recommending Wilderness Areas for the preservation of specific places, the association has adopted the U.S. criteria of selection and delimitation, but with a European adaptation to account for ancient human settlements where there are many artifacts and where past human activity is still evident. A second important adaptation was needed to account for the vast amount of private property and for the rights of local people to use natural resources on public lands.

The association worked in a democratic fashion with municipal government representatives to establish Fosso del Capanno and set management standards for the area. Some of these standards include no road building or artifact collecting but allow renewable natural resource use on private lands and in some public areas.

The association adopted two key concepts during these political actions: "self-resolution," suggesting that local people actively preserve their own "environmental treasures" by themselves and not by means of outside authorities; and "rational use of the renewable natural resources" such as hunting, wood cutting, and pasturage. (Tourism is another "rational use" being adopted today.) Without making allowances for the latter concept, it would be almost impossible to obtain local support for environmental preservation in Italy.

The most important considerations in such a selective criteria were the wild aspects of the area to be protected. Was it isolated with a wild place as its core? Did it have integrity with no roads or utility lines?

Finally, the legislative aspects needed to be addressed. Since Italy had never before designated such a wilderness area, there were no state or regional laws in existence to guide the process. A kind of nonformal moral agreement was first suggested: promote the idea of respecting the area. Later, a formal agreement was made that provided strict protective criteria for the area. The process was extremely democratic because it incorporated local consciousness about the values of a wilderness area. Consequently, the local people were directly invested in the area's preservation.

Every year since Fosso del Capanno was designated, the association has obtained other wilderness designations from municipal or Regional Forest Service authorities, and, in rare cases, from private owners.

The second wilderness area was the first designated by a municipality, the Monte Cesium Wilderness Area. It was established in 1990 and was recently enlarged to include another municipality for a total of 1,310 hectares. The area is near the site where the notorious World War II battles of Cassino and Monte Lungo took place.

Then, a small wilderness area was established: Monte Camulera (Bric Zionia), which is a mere 53 hectares, but there is a strong possibility it will soon be enlarged to include many hundred hectares of woods, thanks to a private acquisition by a patron member of the association.

Another success was the designation of the largest Italian Wilderness Area, protecting a wild valley in the Dolomite Mountains in the Oriental Alps chain: the Valmontina Wilderness Area. As part of a larger wild area of almost 40,000 hectares, which the association hopes to protect in a future designation, this area has a wild core of approximately 1,000 hectares and will be enlarged with public lands to 3,340 hectares.

Other Wilderness Areas include the 2,640 hectares of the Ernici Orientali; approximately 1,000 hectares of Gola del Fiume Rapido and the nearby I Monti Bianchi; the Monte Camino Wilderness Area, the site of the famous feudal Captain Ettore Fieramosca's ancient fiefdom; and the smaller Eremo dello Spirito Santo and Monte Caira-Gole del Melfa Wilderness Areas, near the castle where the monk philosopher Saint Thomas Aquinas was born. All of these areas are located in central and southern Italy.

In the spring of 1998 the association obtained another important inclusion in our system of preserving Italy's wild areas: the Val di Vesta Wilderness Area, which was authorized by a Regional Forest Service office and protects a wild valley in the mountainous region of the well-known Garda Lake. This area, the first in a Regional Natural Park, sets a new precedent for preserving wildlands in officially protected areas.

These preservation efforts have been based on the U.S. wilderness concept, not only to merely preserve these wild areas, but to preserve them in the spirit of Leopold and Marshall, who helped set aside the first wilderness areas in the United States, and in the spirit of the U.S. Wilderness Act, which declares, "wilderness preservation with a forever wild concept." However, in Italy, like many other countries, wild area preservation contrasts with the needs of local people to own private land and/or have the right to use natural resources on public land. Any type of national park or preserve contrasts with such rights. There are national parks in Italy that were established almost eighty years ago where conflicts over rights haven't yet been resolved.

The wilderness idea first set forth in Italy was to preserve only the remaining strictly natural wild areas, working with the local people in order to guarantee a "remaining ancient state" of the land, and at the same time guarantee their use of the renewable natural resources. However, as Vance Martin, president of the International Wilderness Leadership (WILD) Foundation, has suggested, because of this allowance, Italian wilderness areas do not have first-class values. Renewable natural resource use doesn't allow for virgin wilderness. Consequently, according to Martin, Italian wilderness has been classified in the lowest, or third, class.

The WILD Foundation and the World Wilderness Congress have provided strong support in working with Italian politicians and citizens to help establish more pristine wilderness areas in which the local people have decided to give up building roads or other structures. In some cases, on public lands, the locals have chosen to give up wood harvesting, but have continued hunting and grazing. The association has also worked to obtain guarantees against a mass touristic use of these areas, and against "taming" them, so the land can return to a more wild state.

In September 1998 the Italian Wilderness Association obtained a twelfth Wilderness Area in a famous natural landscape site of Italy: the River Po Delta, where the local community (Porto Tolle Municipality, in Veneto Region) opposed a Natural Regional Park, but instead supported a wilderness area designation for its more durable self-resolution environmental protection. This solution obtained unanimous support from the local government and hunters, fishers, mussel breeders, and country dwellers. Hopefully, provincial and regional governments will soon recognize this decision.

There are other wild areas in the process of being designated as Wilderness Areas, many of which are inside, or near, regional and national parks. Political recognition of wilderness as a concept is helping with these designations. In many instances, such as among the Val Grande National Park management staff, the word wilderness has so far only been a tourist slogan.

Today there are twelve Wilderness Areas in six Italian regions, for a total of more than 15,000 hectares. The association is working to enlarge these areas and obtain other designations in areas like the Serra Lunga-Lacerno in Abruzzo, where a deep gorge cuts through the Apennine plateau habitat of brown bears, wolves, and Abruzzo chamois; the Monte Polveraccio, a dense, mature beech forest in southern Italy; and the Is Canargius drainage, one of the wildest areas of chaparral habitat where the Red-Listed Corsican red deer live in the Sardinia Region.

There is a shining future for the big idea of wilderness in Italy, where being part of a worldwide wilderness movement will help preserve planet earth.

New Zealand

Wilderness in New Zealand:

Status, Prospects, and Recommendations

Murray C. Reedy

In the scale of world conservation objectives, New Zealand plays a modest but important role. New Zealand has a unique challenge in that wilderness conservation is not under pressure from population but from introduced plant and animal pests.

Conservation lands cover almost 30 percent of New Zealand, a country with a total land area of 270,500 square kilometers, a coastline of 11,000 kilometers, and a population of just 3.6 million people.

In New Zealand, wilderness conservation is conducted by one fully integrated conservation agency, the Department of Conservation, a government department established in 1987 with new laws designed to clear away the competing (and often conflicting) interests of previous forest, wildlife, historic heritage, lands, and parks departments.

The population pressures on wilderness that are common in most other developed and developing nations are largely absent in New Zealand. The exception being the fact that New Zealand receives over 1 million foreign tourist visits each year, and it is this influx that contributes to direct and indirect pressure on wilderness. The Department of Conservation seeks to mitigate the adverse effects of visitors on wilderness resources through a comprehensive Visitor Management Strategy, which identifies visitor groups by experience preference and demand for facilitated access.

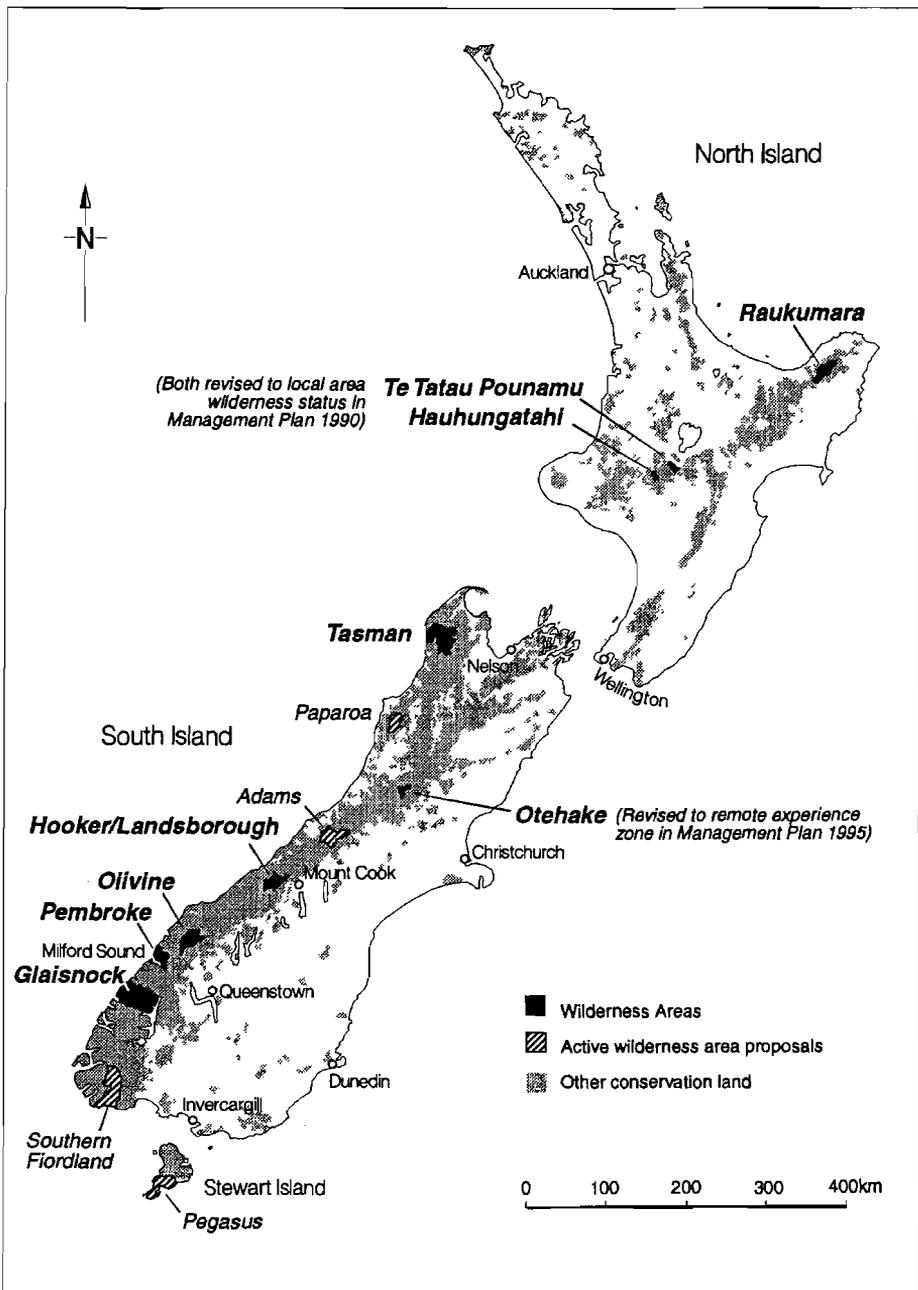
It would be easy to assume that wilderness in the New Zealand context is largely insulated from the pressures facing wildland conservation management generally, or particularly where population and resource use demands are an everyday fact of life. New Zealand has a different set of conservation imperatives, which are equally taxing on resources and technology.

New Zealand occupies a special niche in the conservation of world biodiversity, which is largely derived from its geographic isolation and unique assemblage of Gondwanaland plants and animals. Recognized by UNESCO, Te Wahipounamu World Heritage Area offers an outstanding selection of Gondwanaland species.

The main characteristic of this biota was the lack of any mammal or marsupial life. Unique birds, insects, and reptiles occupied the ecological niches filled elsewhere in the world by mammalian grazers and predators. These features are generally characterized by large size and flightlessness. This balance was upset when settlers progressively introduced many mammals, both herbivores and carnivores, from the countries of Pacific Europe and Asia.

Even though Aotearoa, New Zealand was very probably the last region of temperate land in the world to be settled, over the last 1,000 years that the Islands have been occupied, much of the region's unique biota has been lost. Now extensive amounts of energy and expense must be committed to recover species on the edge of extinction.

The context for wilderness conservation in New Zealand today is:

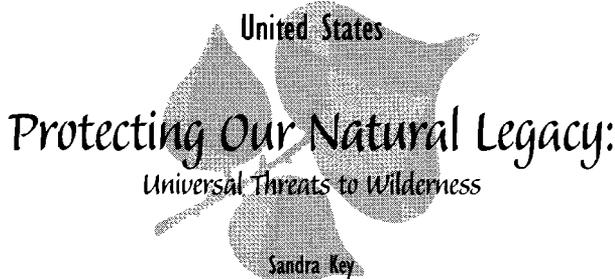


- A land area of similar size to countries such as Norway or Vietnam, the Indian state of Andhra Pradesh, or the state of Colorado in the United States.
- A rugged, mountainous land with large tracts of contiguous temperate rain forest.
- An outstanding mass of coastal wildlife with the largest density of seabirds and marine mammals in the world.
- A dynamic geological and tectonic setting.
- A small, highly urbanized population.
- A predominately westernized lifestyle and relatively successful bicultural society.
- Many introduced plant and animal pests.
- Protected wildlands composed of national and forest parks, ecological reserves, conservation areas, and wilderness areas.
- One integrated conservation agency.
- A conservation management partnership with communities and Iwi Maori.

Within these wildlands the New Zealand Department of Conservation provides for wilderness in a number of ways:

- Defining wilderness in National Conservation Policy.
- Managing wilderness as a recreational concept and as a biological resource.
- Establishing wilderness areas as totally protected sites with the wider context of protected conservation areas.

New Zealand's "total protection framework" for wilderness may seem to be a luxury that can only occur in countries where there is little population or cultural pressure on the wildland resource. However, one needs to reflect on the bigger picture. It is a fact that wilderness means different things to different people and that wilderness is under serious pressure throughout the world. Wild river resources are greatly threatened and biodiversity is diminishing every year. The New Zealand model of wilderness management is an integral part of the global pattern of conservation management, particularly in the context of strictly protecting biological reference points.



Many of the problems and challenges we face in the United States in protecting and preserving wilderness, natural areas, and areas of biodiversity, are similar to the problems and challenges facing many other countries.

The following bit of verse puts this issue in context—an anonymous response to a proposal made by Sir Charles Pratt to fence common land back in 1764:

*The law doth punish man or woman,
That steals the goose from the common.
But lets the greater felon loose,
That steals the common from the goose.*

Protecting the common for the goose—and the flora, fauna, and multitude of other critters who may live there, including ourselves, is really what this is all about.

The concept of wilderness in Western culture has evolved from the time of the European settlement of the North and South American continents. Wilderness was something to be tamed and was seen to stand as an obstacle to human dominance over nature.

Later, the Industrial Revolution brought about an acceleration in the rate of human exploitation of the earth's environment. German sociologist and economist Max Weber ascribed the rapid development of industrialization and the associated growth of capitalism to the Protestant ideology that viewed the earth as a storehouse of resources explicitly available for human exploitation. It was only after the wave of settlement reached the Pacific Coast that the desire to protect samples of wilderness was born.

Aldo Leopold, in his book *Sand County Almanac* (1949), captured this evolution eloquently in describing wilderness as

the raw material out of which man has hammered the artifact called civilization ... to the laborer in the sweat of his labor, the raw stuff on his anvil is an adversary to be conquered. So was wilderness an adversary to the pioneer. But to the laborer in repose, able for a moment to cast a philosophical eye on the world, that same raw stuff is something to be loved and cherished, because it gives definition and meaning to his life.

To protect certain areas from exploitation at the hands of private interests, retaining certain lands in federal government ownership—by creating national parks, national forests, and national wildlife refuges—was the first major step toward protecting the natural environment.

In 1891 Congress granted the president the authority to establish forest reserves from the public domain. In 1897 Congress directed that these reserves were:

to improve and protect the forest within the reservation, or for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber for the use and necessities of the citizens of the United States.

This did not, however, recognize the need to preserve some areas in a natural state. Acting on its own initiative, the U.S. Forest Service created the first wilderness area at the Gila National Forest in the state of New Mexico in 1924. Though in fairness to my colleagues from the National Park Service, the first national park, Yellowstone, was created much earlier, in 1872.

The Forest Service added to its system of wild, primitive, and wilderness areas; eventually it grew to a size of 5.7 million hectares (14.6 million acres).

Since the Forest Service had exclusively relied on its administrative authority, however, in making these designations, there was no law guaranteeing the future of wilderness.

After several failed efforts, Congress finally enacted the Wilderness Act of 1964 and established the National Wilderness Preservation System, reserved to Congress the authority to designate wilderness areas, and directed the secretaries of agriculture and of the interior to review certain lands for their wilderness potential. The act also designated fifty-four wilderness areas with 3.5 million hectares (9 million acres) of Forest Service land. The Wilderness Act defined wilderness as an area of generally undisturbed federal land, "...recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain." (Wilderness Act of 1964, sec. 2 (c)).

Three years later, in 1967, the Forest Service created the first Wilderness Management Research Unit—the only such research unit among all federal land management agencies—and provided much needed research information to support management decisions for wilderness across all federal agencies. This interagency focus was formally recognized in 1993 when the research unit was dedicated as the Aldo Leopold Wilderness Research Institute managed jointly by the Department of the Interior and the Department of Agriculture. The institute is the national leader in developing knowledge about both the ecological and social aspects of wilderness ecosystems.

Congress began expanding the wilderness system in 1968, and today there are 665 wilderness areas, totaling nearly 50 million hectares (104 million acres), in forty-four states. This represents nearly 4.5% of all land in the United States. In general wilderness areas are undeveloped, and commercial activities, motorized access, roads, structures, and facilities are prohibited.

The Forest Service is responsible for managing approximately 400 of the 665 areas in the National Wilderness Preservation System, comprising nearly 13.7 million hectares (35 million acres.)

None of this was accomplished without controversy. Even today, our wilderness system is under assault on a number of fronts.

In the three decades since passage of the Wilderness Act, there has been a rapid growth in the number of wilderness users. In 1996 14.5 million people visited wilderness on national forest lands. The 1989 resource planning assessment predicted that in the year 2005, 35 million wilderness visits would be made and in 2045, 52 million visits would be made. Some wilderness areas are literally being "loved to death," and the concept of solitude—the very heart of the wilderness concept—is being lost.

Certain interests in the United States are trying to prevent the Forest Service from managing for solitude. They are using every means at their disposal to accomplish this, striking at the very meaning of

wilderness. This is one of the most serious attacks on the Wilderness Preservation System since it was created in 1964.

We are also seeing attacks on our wilderness system coming in the form of urban encroachment. The American West has grown enormously since many of our wilderness areas were established, and in some areas suburban development has pushed up to the boundary of national forests and the wilderness areas contained within. The concept of wilderness must be seen in the context of sustainable development and the maintenance of biodiversity. We know we are losing biodiversity on a global scale at an alarming rate. Deforestation and loss of native forest cover is a major factor contributing to the loss of biodiversity.

Of course, baseline information and an effective strategy to monitor trends in this data must inform management decisions to address these problems. The criteria and indicators developed through the Montreal Process are designed to provide data that will allow citizens and resource managers to accurately evaluate the status of forest management and to debate policy options, using common data.

As we have seen in the years following the 1992 United Nations Conference on Environment and Development and through the work of the World Commission on Forests and Sustainable Development, reaching consensus on how to deal with the issues of deforestation and sustainable forest management has proven to be something of a sticky wicket.

One process that has emerged as a promising approach to achieve protection for critical natural areas whilst recognizing local community interest in both sustainability and development, is what has been loosely termed "community forestry."

Empowering local communities to become stakeholders in decisions affecting their surrounding forestlands is proving key to achieving protection for areas of biodiversity and managing for sustainable development.

Last year, the Forest Service sent out a notice to its field units asking them to develop and nominate for selection a series of collaborative stewardship pilot projects that would involve resource protection and restoration as well as any appropriate vegetative management that might be needed. Out of the hundreds of projects nominated, fifty-two were selected to go forward. Key criteria in the selection of these projects were the degree to which they involved, and were supported by outside partners, or collaborators from local communities near these projects. The collaborators were to be involved in the development, implementation, and monitoring. These projects are moving forward, and we hope to begin seeing many of them in the near future.

United States

The U.S. National Wilderness Preservation System

Gerald L. Stokes

The National Wilderness Preservation System (NWPS) consists of 41 million hectares (105 million acres) in 624 units across forty-four states. The U.S. Forest Service (USFS) manages 400 units encompassing 14 million hectares (35 million acres), which constitutes approximately 34 percent of the entire NWPS, including Alaska. However, in the forty-eight contiguous states, the USFS manages 393 units, including 11.6 million hectares (29 million acres) or 63 percent, of the NWPS, excluding Alaska. Hence, the USFS manages most of the wilderness closest to population centers.

Examples of Management Challenges

Among the many challenges the USFS faces are: (1) air quality; (2) fire management; and (3) encroaching development. Each has biophysical, social, and political components.

Many wilderness areas are being adversely impacted by air quality deterioration. We have identified the following air quality related values (AQRVS) for wilderness: (1) visibility (serves as an indicator of adverse effects on other AQRVS); (2) soils; (3) vegetation; and (4) stream and lake chemistry and dependent fish and wildlife.

Air quality impacts are occurring nationwide. The Alpine Lakes and Goat Rocks Wilderness Areas in Washington State are being affected by a power plant in Centralia. The USFS has worked with the state to reduce the effects of this air pollution source. The San Geronimo Wilderness near Los Angeles reflects the air quality impacts of urbanization. The USFS has researched ozone damage to vegetation for thirty years in this area. Visibility is so severely diminished on the most polluted days that visibility-monitoring cameras produce only black photographs. The Mount Zirkel Wilderness in Colorado is being affected by a power plant in Hayden. The USFS has worked with the state and the U.S. Environmental Protection Agency to reduce the effects of this power plant. The James River Face and Saint Mary's Wilderness Areas in Virginia are being impacted by pollutants generated in the industrial centers in the Ohio Valley of the Upper Midwest and transported to Virginia by prevailing air currents. The Saint Mary's River (a state-recognized blue ribbon trout stream) within the wilderness is so affected by acidification that the USFS is proposing to add lime to the stream to reduce the acidity.

Fire management is another challenge. The United States has had six to seven decades of highly successful fire suppression that has significantly altered the natural fire regimes in wilderness areas and surrounding landscapes. This has resulted in ecological stagnation and fuel buildup to unmanageable, catastrophic levels. This is perhaps the most significant human-caused impact on U.S. wilderness areas.

For several years the USFS has had a prescribed natural fire (PNF) policy to gradually alleviate this problem. Under this approach, fires ignited by lightning strikes have been allowed to burn naturally within

certain criteria. However, this is inadequate in reestablishing the natural fire regime in many wilderness areas. Thus, the USFS is considering broader applications of the "management ignited fire" (MIF) to recreate the mosaic that the natural fire regime would have produced. Fire management in wilderness areas is rife with political, safety, scientific, technical, and philosophical challenges.

Encroaching urban development is an increasing challenge for wilderness managers. As in the case of the San Geronimo Wilderness, increased urbanization and sprawl affects air quality, which in turn adversely affects wilderness flora and fauna. The increase in the urban and rural interface also increases fire management challenges regarding the effects of smoke on populated areas and the risk of PNFs and MIFs reaching developed areas. Furthermore, urban encroachment fragments the landscape, compromising wildlife corridors and threatening population viability. For example, a remnant population of grizzly bears in the Mission Mountains Wilderness in Montana is increasingly being isolated from other breeding populations because of development in the adjacent valleys.

The Changing Political Environment

After seven years of debate the U.S. Congress passed the Wilderness Act and President Johnson signed it into law in 1964. The U.S. Senate passed a stronger version in 1963 by a vote of seventy-three to twelve. After several amendments to the Senate version, the House passed the Wilderness Act by a stunning 373 to one vote. Obviously, the Wilderness Act had strong bipartisan support. This impressive majority of support was due to: (1) the leadership efforts of congressional statesmen such as Hubert Humphrey, Morris Udall, Frank Church, Clinton Anderson, and John Saylor; (2) focused, passionate leadership in the conservation community; and (3) an outpouring of public support through organized efforts.

The passage of the Wilderness Act was the high-water mark of a century of conservation efforts, beginning with the establishment of Yellowstone National Park in 1872. In the ensuing years after passage of the Wilderness Act, the wilderness debate focused on allocation, or what remaining roadless acreage would be added to the NWPS. The system grew from the original 3.6 million hectares (9 million acres) to the current 41 million hectares (105 million acres).

Now, the political climate and wilderness debate have shifted dramatically. The debate has moved from allocation to management, and USFS managers are constantly faced with administrative, legal, and political challenges in their efforts to maintain the integrity of the NWPS, as they and their legal council interpret the Wilderness Act and more than thirty years of established policy. Wilderness management today is unprecedented because: (1) society has changed dramatically due to population growth, urbanization, and immigration, with attendant loss of people's connection with the land and nature; (2) the great statesmen, with their conservation ideals, and much of the institutional memory and bipartisan support associated with the history of the wilderness movement, are gone; and (3) there are no longer wilderness champions in key legislative roles who can filter legislative proposals that threaten individual wilderness areas and the NWPS as a whole.

During the last Congress, there were seven legislative proposals and numerous committee hearings that threatened the integrity of the NWPS. Although all the legislative proposals came close to being enacted into law, only two actually passed. One legislative provision that passed was intended to open some of the portages in the Boundary Waters Canoe Area Wilderness in Minnesota to motorized use. The other transferred title of a 5-hectare (2-acre) parcel of the Mount Naomi Wilderness in Utah to a private individual who asserted the USFS had made a boundary error. Both these legislative provisions are establishing bad precedents.

The USFS portion of the NWPS is under siege. For those who value this globally significant protected area system, this is wake-up call. If the NWPS is to survive the next century rather than erode away like a sand castle in the rising tide, there must be broad public support for maintaining the integrity of the system such as coalesced around passage of the Wilderness Act in 1964 and subsequent additions to the NWPS.

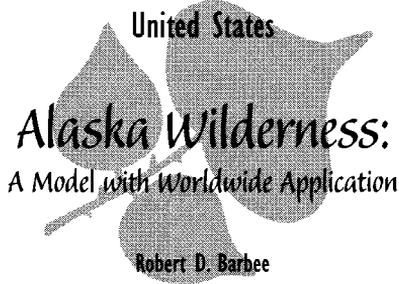
Strategy for Building Support

There are three interrelated components of a strategy that must be implemented in order to avert the incremental erosion of the NWPS. First, the public needs to be better informed and educated about the true values of wilderness in society, moving beyond the values placed on it by those who take advantage of its recreational opportunities. Additional societal values include: (1) air quality through the protection of the Clean Air Act; (2) water quality and watershed values critical to many urban water supplies; (3) refugia for threatened and endangered species of plants and animals; (4) the “miner’s canary” syndrome and scientific baseline for assessing the overall environmental health of the United States and the planet; and (5) the vicarious enjoyment of the people who take solace in knowing these places exist but may never actually visit a wilderness area.

Second, in order to accomplish the above, there needs to be a coherent, coordinated system of key indicators with which to monitor and assess the health of the NWPS. This information can then be reported to Congress and the general public to benefit the NWPS and broader ecosystems at the regional, national, and global levels.

Third, information management systems need to be in place that can accommodate the data necessary for informed wilderness management and monitoring. This tool will enable managers to build support for the NWPS within the managerial ranks, Congress, and the public at large.

All wild places are part of a greater interrelated whole; the natural best of what’s left of the components of the global ecosystem on which all creatures are dependent. The degradation of one, whether in India, the United States, or elsewhere, diminishes the entire system of remaining wild places. Human beings share a common bond in conserving the remaining crown jewels of the natural world.



The story of U.S. Alaskan wilderness offers lessons that can be used around the world. Alaska is remote place where both traditional and emerging ideas of what wilderness is and can be come together.

Leaving Anchorage on a jet and flying northwest for about 1,000 kilometers, we arrive at Kotzebue, a small city of approximately 3,000 people, mostly Inupiat Eskimos. Next, we board a four-seat, single-engine float plane and fly another 250 kilometers to the north, eventually landing at a place called Desperation Lake. For most of the distance in the air since leaving Anchorage we have flown over what can officially or practically be called wilderness—very few settlements or roads, no dams, fences, boat harbors, or trails.

Desperation Lake sits amid the Arctic tundra near the crest of the Brooks Range, far to the west of where wilderness-advocate Bob Marshall rambled. It is one of those defining places for the ideal of wilderness, where the natural world has apparently had the upper hand since the beginning.

Yet when we sit down for lunch, we are in a *karghi*—a stone ring structure where early Alaskan natives once sat—looking out across the lake toward a pass through which caribou would come, steered by rocks and poles placed to aid in their ambush. These animals were food for the night and a matter of survival for the winter. Desperation Lake, far from being empty wilderness, was the homeland and hunting ground for these hardy people.

Nearby, stone tools are found that tell their story in more detail—obsidian flakes obtained in trade from people hundreds of kilometers away. Blades for spears, stones shaped for scraping the skins that would become clothing or shelters, and bits of charcoal for a warming fire. All these artifacts are hundreds or thousands of years old.

So here we are in a vast wilderness, not one devoid of human influence, but one with a human history something on the order of 10,000 years. This quintessential wilderness is not a land untrammled, but instead bears silent witness to countless generations of humans who left just scant evidence of their culture.

The lesson of Desperation Lake, as with other places in Alaska and around the world, is that wilderness encompasses not just natural ecosystems but those that have evolved with the activities of humans very much in evidence. And we must remember that while generations of people were carefully tracking the movements of caribou in the Arctic, ancient India was producing astronomers, philosophers, and mathematicians, and building an empire that would rival those of China, Egypt, and Rome. Their “wilderness” days came many millennia before those in Alaska.

So while it is impressive that the descendants of those early hunters on Desperation Lake are still thriving in the Arctic today, we must remind ourselves that people have existed in Asia and Africa for perhaps 2 million years. People have been living and multiplying on this earth for a very long time. Yet we have all evolved within wilderness, some cultures more recently than others, and in order for wilderness to

continue to play a role in the evolution of the human race, it must be a meaningful concept that is far more inclusive than many would have us embrace today.

Those in the environmental movement understand that most wilderness was never really devoid of human beings, that people have always played a role in the ecology of the natural world through hunting, with fire, with migrations, and more recently with vast amounts of resource extraction. This is a common heritage, and it can be a common language with which we can all come to understand each other better.

For North America's original residents, "wilderness" was home. The Western idea of an empty wilderness was only possible when the original residents died from disease, war, and cultural assimilation. The effect this had on wilderness management and U.S. legal concepts of wilderness was the view that permanent human habitation within wildlands was unacceptable—no permanent residences, no roads, no aircraft landing on lakes, no vehicles carrying people around. This remains the prevailing situation in most of the U.S. wilderness system—except for Alaska.

The results of that model have not been negative. In the United States some of our most beloved wild places are too fragile and small to encroach upon them with all the machinery and technology today's cultures can muster. But it is not a model that can be easily extended worldwide. Instead, we need a model that works toward the dual goals of preserving large natural areas and the vast resources within them, while at the same time allowing for certain traditional uses. Alaska, I believe, provides a new model along these lines.

Bear with me, though, for a brief history lesson that will put my next comments in perspective. Alaska is a young state, joining the United States in 1959. It is a vast place—some 145 million hectares—and lightly populated, with only about 600,000 people. The federal government has owned most of the land since it was purchased from Russia in 1867. As part of gaining statehood, the state government was allowed to select about one-third of the lands out of the federal domain. With these lands, the state was free to support development and provide land for growing communities.

In the 1960s several forces, including the development of oil fields at Prudhoe Bay, came together to bring about a settlement of the land claims of native Alaskans. The descendants of the original residents received the right to select approximately another 18 million hectares (44 million acres) from the federal domain. In that legislative process, conservationists who saw the partitioning of Alaska into state and corporate hands pushed for and achieved a provision for the eventual designation of new national parks and wildlife refuges in Alaska. This in turn led to the largest single conservation law in history—The Alaska National Interest Lands Conservation Act of 1980.

With that legislation, nearly 13 million hectares (32 million acres) of wilderness in Alaskan parklands was designated, along with ten new units of the National Park System. Additional wilderness areas and other land protections were put in place for national forests and wildlife refuges. For the first time, vast areas were protected—the majority of the Brooks Range from Canada to the Chukchi Sea, the Wrangell Mountains—some six times the size of Yellowstone National Park, and in wildlife refuges the vast wetlands at the mouth of the Yukon and Kuskokwim rivers. This legislation was revolutionary in nearly every respect.

Among its most enduring features was how it dealt with wilderness conservation. It sought to protect not only the land but also the people on the land. It provides for uses not normally allowed in other protected areas in the United States. These include motorized access by airplanes, motorboats, and snow machines for traditional activities.

The act recognized the legitimacy of people harvesting food within a natural ecosystem. Every year, thousands of rural Alaskans harvest, process, and consume wild animals, fish, and plants from public wilderness lands. The law gave it a name, "sustenance," and collectively subsistence activities constitute a unique relationship with the natural world. For example, in Kobuk Valley National Park, Inupiaq Eskimos continue their subsistence lifestyle by hunting the vast Western Arctic Caribou Herd. They take a small percentage of the several hundred thousand animals, acquiring not only a source of food but maintaining an unbroken cultural link to their ancestors at Desperation Lake.

Clearly differences have evolved over 10,000 years. Today's native Alaskans are as eminently practical as their ancestors. They are now most likely living in small permanent villages with airports, schools, Internet links, and medical clinics. The obsidian spears are gone, replaced by high-powered rifles. Yet for thousands of families, the dinner in the pot over the winter is still caribou or salmon harvested from neighboring lands. In rural Alaska, the per capita consumption of wild fish and game harvest is on the order of 150 kilograms per year.

The challenge that the Alaska Lands Act presents wilderness managers and subsistence users is to forge an alliance that allows room for the continuation of healthy populations of fish, plants, and wildlife, while allowing for the continuation of people deriving a large portion of their living from a wild landscape. The Alaska Lands Act model allows people to continue to acquire food and sustain their cultural practices on the land, but honors the spirit of the Wilderness Act by preserving an enduring resource of wilderness. While not without its problems, I believe this law provides a foundation for a land management model that has far more applicability around the world than a model that excludes traditional practices of the resident population.

In this model, there is a clear need for subsistence users, land managers, and wilderness advocates in Alaska and elsewhere to work together—the stakes are too high not to embrace our common needs and values.

The preindustrial cultures often left little lasting impact on the land. Today our economy is global, and a burgeoning population has ever-higher demands for minerals and the other raw materials that sustain life. We are a world that is increasingly dependent on fossil fuels, which are altering our global ecosystem in ways that we can only guess. We are in command of technologies that allow us to destroy life on a scale unimaginable. Technology makes even the most remote wilderness areas widely known and easily accessible—even Desperation Lake is less than twelve hours from Los Angeles in today's world.

If this seems depressing, remember that we have succeeded in many places. By leaving millions of acres of Alaska wild, by protecting the ancient rhythms of caribou and salmon migration, by preserving opportunities for today's residents in rural Alaska, we maintain the touchstones to the past. We acknowledge that some places must be set apart as sanctuaries from the prideful progress of civilization.

We must go home from here to strongly reaffirm to our fellow citizens the need for wild places, for sanctuaries, for places where the older rhythms reign. We must push for a spectrum of wilderness places throughout the world and advocate that not all wilderness areas need to be all things to all people.

As we approach a new millennium and the fact that 6 billion people will be living on this planet, success may be attained by advocating a model similar to the one practiced in Alaska: a model where the spirit of wild places is honored, whilst the reality of some human use is acknowledged.

Wilderness is our past and our future. It is the geography of hope. Wealthy nations and poor, ancient cultures and new have their roots in the wild land. We have all lived at Desperation Lake.

NORTH AMERICA

United States

The Arctic National Wildlife Refuge:

The Evolving Meaning of a Symbolic Landscape

Roger W. Kaye and James W. Kurth

America's National Wildlife Refuge System

America's National Wildlife Refuge System was born ninety-five years ago. It began humbly, with a 3-acre island off the coast of Florida. Market hunters had relentlessly pursued Pelican Island's nesting pelicans, herons, and egrets for their fashionable feathers. If the birds were to survive, something needed to be done. Our first conservationist president, Theodore Roosevelt, took an unprecedented action: He declared the tiny island a sanctuary for birds—the first national wildlife refuge.

The coastal nesting grounds of other migratory birds were also in need of protection, and more refuges were set aside. In the 1930s the developing idea of a refuge system was expanded to include the waterfowl breeding grounds of the north-central states. Habitat for bison, elk, and pronghorn antelope in the western states was added to the system, then habitat for Alaska's giant moose of the Kenai peninsula and brown bears of Kodiak Island. In more recent years refuges have been established to protect endangered species such as the Key deer, Attwater's prairie chicken, and the Mississippi sandhill crane.

Today the National Wildlife Refuge System includes over 500 units, which protect 93 million acres (37.6 million hectares) throughout all fifty states. Unlike most other conservation units, wildlife refuges are mostly wetlands, important habitats for the migratory birds that are a major trust responsibility of the U.S. Fish and Wildlife Service. And unlike many other public lands, the refuge system is not governed by multiple use principles. The primary purpose of the National Wildlife Refuge System is wildlife conservation. People are allowed to use and enjoy refuges in ways compatible with this purpose. The priority public uses of the refuge system are hunting, fishing, wildlife observation, photography, environmental education, and interpretation.

Over the years the range of values the refuge system protects has been expanded by the designation of seventy-one wilderness areas, encompassing 20.7 million acres (8.4 million hectares). These areas provide our highest level of protection for wetlands, prairies, forests, and islands. From the Florida Keys to New Jersey's Great Swamp to Minnesota's north woods to Arizona's desert, areas are managed to maintain their wild, undeveloped character. And in Alaska, a wide spectrum of marine, subarctic, and arctic habitats benefit from the added protection of wilderness. This state holds the vast majority of wilderness within the refuge system, more than 18 million acres.

What Does Wilderness Contribute to Refuges?

The wilderness overlay deepens and broadens our perspective of these landscapes. They compel us to think beyond managing them as habitat for the wildlife species of greatest interest to us. These areas lead us to think more ecologically. In the wording of the Wilderness Act, wilderness is "where the earth and its



The Arctic National Wildlife Refuge. PHOTO COURTESY OF JAMES W. KURTH.

community of life are untrammelled by man," a reservoir of biological diversity and natural ecological and evolutionary processes. In the words of the pioneering ecologist Aldo Leopold, wilderness is a laboratory, "a base datum of normality, a picture of how healthy land maintains itself" (Leopold 1949).

But wilderness embodies values that transcend the biophysical. The history of the Arctic National Wildlife Refuge is the story of a nation's evolving awareness of the range of meanings and lessons wilderness landscapes offer.

The Arctic National Wildlife Refuge

The 20-million acre (8.1 million hectare) Arctic National Wildlife Refuge is the largest, the wildest, and most free from human influences and intrusions of all the national wildlife refuges. The effort to protect it began in 1952 with National Park Service planner George Collins and biologist Lowell Sumner. In the course of an Alaska-wide inventory of potential parklands, they discovered the superlative values of the eastern Brooks Range. Here was an area encompassing the full spectrum of North American arctic and subarctic habitats, and large enough to be permanently self-sustaining. Because caribou and other wildlife were rather unconcerned with the international border, they urged Canada to join in the effort to create an international reserve.

Collins and Sumner recruited the acclaimed arctic biologist and Wilderness Society president Olaus Murie, and the three launched a spirited campaign to protect the area. They and other supporters debated which agency should administer it. Clearly, it possessed scenic and recreational values most associated with parks. But a park, they feared, would be subject to pressure to develop recreational facilities, perhaps even roads—a thought anathema to their vision of an unaltered wilderness.

Further, the concept of a national park where indigenous people hunted for subsistence was not an idea the National Park Service was ready to sanction at that time. Yet no one wanted to prevent indigenous people from hunting and trapping (Catton 1997).

Another consideration was that in Alaska, establishing a national park might be politically impossible. Thus, overall, it seemed that the most likely and the most wilderness-sensitive protection would come from the U.S. Fish and Wildlife Service.

While many people were involved in the effort to establish the Arctic Range, clearly the vision of Collins, Sumner, and Murie was the catalyst. These people, whom we refer to as the refuge founders, foresaw the type of threats that would confront Alaska's natural areas.

As a result of the work of these founders and the thousands who joined them, on December 6, 1960, the secretary of the interior issued a public land order withdrawing 8.9 million acres (3.6 million hectares) in northeast Alaska. It stated three purposes: to protect the area's unique wildlife, wilderness, and recreational values. The Arctic National Wildlife Range was established.

The purpose of this effort was not fully realized, however. Canada had not yet acted to protect adjacent areas, although it would later establish two national parks adjoining the refuge. What would become the greatest shortcoming of the legislation was the fact that the range—not thought to hold oil—was not closed to oil development. Thus, the underpinning of the continuing and tumultuous debate over what the Arctic Refuge was, is, and should be.

The range lay quietly until the mid-1970s when Congress began debating the establishment of new refuges, parks, and other conservation units in Alaska. In 1980 the Alaska National Interest Lands Conservation Act was passed. The act doubled the size of the range, renamed it the Arctic National Wildlife Refuge, and designated 8 million acres of it as wilderness. Special provisions supported the subsistence activities of the local rural residents, including a priority over other consumptive uses. But in this great conservation legislation there loomed large compromises; among the most controversial was a mandate to study the oil and gas potential of the refuge's northern coastal plain.

Pools of oil are now thought to lie beneath this expanse of tundra that slopes from the mountains to the Beaufort Sea. Their size is uncertain, but they might hold billions of barrels, worth billions of dollars. While oil development was prohibited by the act, it left the possibility open to future congressional action. Two decades after the act, after countless studies, countless debates, the fate of this place remains undecided.

Vexing questions have emerged from the often bitter political controversy over whether to develop this potential resource, or to preserve this primal place. Some questions have been directed to science. For example, we've done extensive research on the question of potential impacts of industrial development upon the 130,000 animal Porcupine Caribou Herd, whose ancestral calving grounds lie atop these reservoirs.

But the more provoking questions resist the techniques of science. They defy the tools of traditional economic valuation and cost-benefit analyses. Questions like how does the potential reduction or displacement of caribou, or muskox, or polar bears, or snow geese measure against potential dollar revenues? How would diminished scenic beauty, diminished recreational opportunities, or diminished hunting traditions of the indigenous people stand against economic benefits?

For whom, besides the couple thousand annual visitors to the refuge, is the United States being asked to forgo all these potential barrels of oil? And a more encompassing question: What relevance does this remote place have; indeed, what relevance does the concept of wilderness have, for a nation that, as Ramachandra Guha has pointed out, is so prone to overconsumption, so resistant to restraint, and so unwilling to accept the root causes of its ecological dilemmas (Guha 1989)?

Such questions led us to probe the history of the Arctic Refuge, to explore the deeper values that those visionary conservationists found here in the 1950s and sought to perpetuate. This exploration inevitably led us to consider the evolving ideas that were to become encapsulated in the Wilderness Act, to which the refuge's history is inextricably linked. In the process of this researching and soul-searching, some insights have emerged that are relevant to the larger questions—and criticisms—the wilderness idea faces today.

One such criticism is that the idea of wilderness is woefully ethnocentric, ignoring the presence and effect of aboriginal people (Callicott 1991). The role of indigenous people was not a central part of the vision of the refuge founders. They did not see a problem with the fact that the area was sparsely populated by indigenous people who used the area for their subsistence. They did not foresee the extent of future debate on native land claims and self-determination, or how to best provide for either the traditional uses or the changing uses of the land by indigenous people.

Many say that wilderness is a Euro-American invention, and that this concept of wilderness inappropriately sets humans apart from nature (Cronon 1995). If so, perhaps the idea of wilderness has no relevance to other countries. Perhaps it holds no meaning for U.S. citizens who do not share this heritage.

No doubt, the American idea of wilderness is deeply embedded in the notion that wilderness is a vestige of our frontier past. From the scene of the first Europeans stepping off the *Mayflower* to our mythologized era of westward expansion and conquest, wilderness is venerated as the crucible of American culture. It is the setting we believe forged our unique national identity. Teddy Roosevelt and Aldo Leopold argued that wilderness would preserve remnants of this heritage and provide opportunities to revisit conditions of this pioneering past (Nash 1982).

Robert Marshall, the leading wilderness advocate of the 1930s, imported this cultural heritage value to Alaska's Brooks Range and effectively advocated for a "permanent American frontier" in northern Alaska (Marshall 1956). This wilderness-as-a-museum-of-cultural-heritage idea was clearly present in the thinking of the refuge founders. In their seminal article "Northeast Alaska, the Last Great Wilderness," George Collins and Lowell Sumner wrote that "this area offers what is virtually America's last chance to preserve an adequate sample of the pioneer frontier" (Collins and Sumner 1953). To founder Olaus Murie an important purpose of the refuge was to let people of the future have an opportunity to visit the wilderness and draw upon the inspiration that comes from the frontier.

But what value can this wilderness purpose hold for the Athabaskan Indians and the Inupiat Eskimos who reside near and use the refuge? What about other Native Americans, or citizens of Asian, Latin American, or other descent? We need to recognize that the heritage meanings of wilderness are not universally accepted.

Another charge we hear is that wilderness areas like the Arctic Refuge are set aside primarily for a discrete group of backpackers, hunters, climbers, and floaters. Recreation, and the restorative and personal growth benefits associated with it, has long been a central component of wilderness. It became enshrined in the Wilderness Act. It became one of the three original purposes of the Arctic Refuge. Recreation here was, in Murie's words, "a superb opportunity ... satisfying an important human urge, the use of wilderness, as wilderness" (Murie 1961).

Protection of scenic values was also a prominent consideration in both passage of the Wilderness Act and the establishment of the Arctic Refuge. It also continues to be employed by refuge defenders. But scenery is another sandy foundation for a defense of this place. As prodevelopment interests have pointed out, for most of the year the refuge's coastal plain is snowbound, windswept, and cold, providing neither recreation nor what many consider scenic beauty.

But early notions of the aesthetic value this landscape holds went far beyond picturesque or even monumental viewsheds. It embraced the concept Aldo Leopold advanced as the *Ecological Esthetic* (Leopold 1949). That is, beauty emerges from inherent qualities, deeper and beyond the visual, experiential components of the surface. A kind of pleasure and satisfaction emerges from knowing the land is ecologically fit and whole, knowing it continues, untouched and free, toward its evolutionary destiny. Knowing it is wild.

It is significant to note that the 1950s campaign to establish the Arctic Refuge occurred at a pivotal period in American environmental history. Leopold's *Sand County Almanac* had recently been published. The beginnings of a new ecology-based environmentalism were on the horizon. The dominant utilitarian conservation paradigm was being questioned by a few far-sighted scientists. Among them were our founders, whose vision made this area a landmark in the transition between traditional conservation and the newer environmentalism. The set of values they spoke for was, in the words of historian Peter Coates, "a seminal expression of a maturing ecological awareness and a cultural revolution in American attitudes toward wilderness" (Coates 1993).

As noted, the refuge founders did not abandon the inherited notion of wilderness as an historic document of America's past. Rather, they extended this idea of wilderness as a museum to broaden the concept of historic preservation. This remote wilderness, they believed, could preserve the kind of conditions and processes that once surrounded and formed us—not just as Americans, but as *Homo sapiens*. But more expansive still, their perspective of history was ecocentric and global.

Thus, Murie's hope in protecting this place was to preserve "a little portion of our planet left alone." He referred to the political campaign as the "basic effort to save a part of nature, as evolution has produced it." Doing so, he said, would help us "understand the basic energies which through the ages have made this planet habitable" (Murie 1961).

Murie, Collins, and Sumner wrote eloquently about the solid realities of this landscape, and the cultural, scientific, and experiential values they found within. But resonating through their writings is a more abstract notion, the belief that this place is also the representation of an idea, or perhaps, an ideal. The refuge is also a symbolic landscape. A place of meanings, values, and lessons that transcend its boundaries.

On the occasion of the refuge's twenty-fifth anniversary, Lowell Sumner made a comparison with the Statue of Liberty. The refuge also symbolizes freedom he said: "Freedom to continue, unhindered and forever if we are willing, the particular story of Planet Earth unfolding here." He said the refuge also served as a place

where we can learn to appreciate and respect the intricate and inscrutable unfolding of Earth's destiny—when free from meddling human concerns and the urge to take possession of and use up what we so imperfectly understand (Sumner 1985).

We find parallel sentiment in the Wilderness Act of 1964, passed four years after the refuge's establishment. In what may be the most important phrase of the act, primary author Howard Zahniser described wilderness as "where the earth and its community of life are untrammelled by man." By "untrammelled" he meant unrestrained, uncontrolled, and unmanipulated. This recalls the root meaning of the word wilderness: wild, or self-willed, as opposed to domesticated or tamed.

Like Collins, Sumner, and Murie, Zahniser recognized the cultural, recreational, and scientific values of wilderness—and thought beyond them. "The most profound of all wilderness values in our modern world," he declared, "is an educational value." In wilderness, he said, "we sense most keenly our human

membership in the whole community of life on the Earth.” A central contribution of wilderness, he believed, was that it served as an aid “in forsaking human arrogance and courting humility” (Zahniser 1956). With these insights, we return to the question of relevance.

Looking at the role of the wilderness idea from its beginnings through the era of the refuge campaign, to today’s environmental challenges, historian Roderick Nash draws upon these ideas and states that one of the greatest contributions of wilderness to modern society is symbolic: The act of preserving wilderness serves to develop and reinforce environmental responsibility. “Wilderness areas are a gesture of planetary modesty,” Nash says. They are “the best places on which to build a legacy of limitation.” He agrees with Guha that the concept of restraint doesn’t come easily for Americans (Nash 1976). Nor does the concept of humility, which as wilderness researcher William Borrie has pointed out, “is the initial experience that binds people to deeper values of care and relationship” (Borrie 1995).

As Nash notes, such humility emerges from the knowledge that the primary purpose of such places is not to produce benefits for our consumption. Rather, as the refuge founders emphasized, this place serves to enhance respect for other life-forms and to perpetuate the ecological and evolutionary heritage all people share with them. As ecologist John Milton said following his eight-week journey through the refuge, “it’s purpose is to *be*. Man’s role should be ... let it be” (Milton 1970).

Lowell Sumner compared the refuge to a national monument most Americans will never see. But by *just knowing* it is there, they have a tangible entity to which they can attach national values they hold dear and believe should be enduring. The Arctic Refuge serves a similar function for natural values. But for many, it has also become a medium that connects them to something beyond the merely human world and its creations, it is something that they believe has a more profound, universal importance. As such, it is among the world’s landscapes that, across cultures and across time, have served humanity as a sacred place.

One need not backpack or float through the refuge to be touched by the meanings it has come to represent. Just as oil has emerged as a symbol of our profligacy and ecologically threatening habits, the successful struggle (so far) to keep oil rigs out of the refuge has come to symbolize an encouraging capacity for restraint. It is a demonstration and reminder of what we can do right. Its boundaries represent the limits we are capable of placing on ourselves. It has become part of what Wallace Stegner summarized as Americans’ geography of hope (Stegner 1969). This is what refuge defender Debbie Miller meant when she stated hopefully that

just knowing the timeless values this place represents have triumphed over competing economic values—it provides the kind of encouragement and hope we need to address our other environmental threats
(Miller 1997)

Over and over at the Arctic Refuge, we have seen Leopold’s aesthetic power of wilderness transform such idealism to action—the evocation of a force that enlightens and inspires and motivates. We have seen it compel countless citizens, most of whom will never visit the refuge, to write and testify. With increasing effectiveness, they remind political leaders and the nation that oil dollars are a fix that can only be temporary, while this wilderness is a legacy that can be forever timeless. So we stand committed to the promise—the promise made by the past generation to all future generations—that this remnant landscape will be passed on undiminished, that its values will endure.

SECTION IV



*Wilderness
and
Ecological
Restoration*



Participatory Resource Monitoring by Soliga Tribal People at Biligiri Rangaswamy Temple Wildlife Sanctuary

R. Siddappa Setty, K. S. Murali, and H. Sudarshan

Millions of people throughout the world and in India derive their livelihoods by extracting a wide variety of natural products from local ecosystems. In many cases, such resource extraction is unsustainable; that is, the amount of resources extracted exceeds the amount that is replenished by growth and reproduction. This is so especially in the case of wild species.

Communities dependent on wild ecosystems often do not have the means to monitor the replacement rates, though crude monitoring systems may have existed in the past and may even exist today, in some areas. Although there is an increasing emphasis on involvement of local communities in conservation and management of natural resources, there are few community-based monitoring systems in place.

Biodiversity Conservation Network Project

One enterprise-oriented approach to community-based biodiversity conservation is a Biodiversity Conservation Network—sponsored project at Biligiri Rangaswamy Temple Wildlife Sanctuary in South India. This is a unique, collaborative venture between Vivekananda Girijana Kalyana Kendra, Ashoka Trust for Research in Ecology and Environment, and Tata Energy Research Institute.

The project has three components: (1) a biological monitoring component to assess sustainable extraction levels of forest products; (2) a socioeconomic component to develop a comprehensive picture of the socioeconomic factors that influence biodiversity in the Biligiri Rangan Hills region; and (3) an enterprise component that will process a variety of nontimber forest products (NTFPs) extracted by the local Soliga tribal people.

The Soliga people have inhabited the Biligiri Rangan Hills region for millennia and have traditionally engaged in shifting agriculture and hunting. The Soliga people have also collected a wide range of NTFPs, traditionally for their subsistence needs, but later for forest contractors as well. Shifting agriculture has been discouraged since the late nineteenth century, and, with the declaration of much of the area as the Biligiri Rangaswamy Temple Wildlife Sanctuary in 1974, shifting agriculture and hunting were completely banned. At that time, the Soliga people were allocated small pieces of land where they could practice settled agriculture. However, the extraction of NTFPs continued under the aegis of tribal cooperatives, or Large-Scale Adivasi (Tribal) Multi-Purpose Societies (LAMPS).

The LAMPS were created as vehicles for tribal development, particularly to ensure full return on the collection of NTFPs to which the tribal people were given sole rights. The Soliga people used some rules of thumb for their sustainable harvests. As the scale of extraction has changed, these rules are no longer practical, and, therefore new guidelines need to be set to conserve the resources for their continued income generation from the forests.

Resource monitoring incorporates three basic concepts: (1) productivity; (2) levels of extraction; and (3) regeneration capacity of the resource in relation to extraction. Productivity refers to the amount of resource produced at the individual or population level and is related to the size and density of plants. Levels of extraction may be determined at two levels, one at the individual plan level and the other at the population level (i.e., the amount extracted per unit area). Regeneration refers to the number of seedlings and saplings per unit area and variations in these numbers over time and space.

Participatory Resource Monitoring

The Soliga people received Participatory Resource Monitoring (PRM) training and base-mapped the resources around their villages. They estimated productivity, amounts of extraction, and extent of regeneration. The following is a description from a PRM exercise for nelli or amla (*Emblica officinalis*), the fruits of which are traditionally harvested by the Soliga people.

- *Productivity:* Tribal LAMPS directors and nelli harvesters estimated the amount of fruit at different places in the Biligiri Rangaswamy Temple Wildlife Sanctuary and arrived at an estimate of total productivity. In each particular area, the group walked for approximately one kilometer and estimated the productivity visually. At the end of the walk, the directors and harvesters discussed the productivity of that particular area.
- *Extraction:* The information regarding the total amount of nelli harvested was obtained from LAMPS, which purchased nelli from the harvesters. The LAMPS maintained details pertaining to daily collection of nelli. All the areas of extraction were recorded on a base map, which indicates details about the areas of nelli extraction during a given day in terms of the basic topography of the area. The extraction at tree level was determined visually by the field assistants who are also tribal people and have the knowledge to visually assess the quantum of fruits available in a particular tree.
- *Regeneration:* A team of ten to fifteen harvesters went to the forest to estimate regeneration. They laid out 20-by-20-meter plots, with three or four plots per site. Then they counted the number of nelli seedlings in each plot.

The results of this exercise showed that only 70 to 80 percent of the fruit is harvested from each tree. Some of the fruits are left behind because they are on inaccessible branches. Trees with low yields or with small or diseased fruits are not harvested as intensely as those trees with high yields or with large or disease-free fruits. The harvesters believe that leaving behind 25 percent of the fruit on individual trees is enough to foster regeneration of nelli trees. Following are the specific results from the PRM exercise.

- *Productivity:* The tribal LAMPS directors and extractors estimated that 65 tons of nelli fruit was available for harvest during 1997 in the Yelandur Range of the Biligiri Rangaswamy Temple Wildlife Sanctuary.

- *Extraction:* Tribal people harvested only 70 percent of the total productivity, and they harvested only 77 percent of total available fruits on each tree.
- *Regeneration:* Fifty-eight harvesters from four podus participated over a period of four days in estimating regeneration at seven sites. There were only seventy-six saplings found in the survey, while 248 trees were measured for their harvest intensity.

The PRM participants were satisfied with the methodology used in the exercise and felt the whole monitoring process was useful. They found the mapping exercise especially useful, as they could identify roads and forest boundaries. Further, they felt the entire exercise of monitoring and keeping a record of the resources was good for conservation efforts in general and also good for their own livelihoods.



Human, Animal, and Wildlife Interactions:

*Problems and Solutions
for the Nilgiris, South India*

John D. Griffith and Michael W. Fox

The United Nations designated the Nilgiris Biosphere Reserve in 1982 in an attempt to draw attention to the plight of its magnificent yet deteriorating biodiversity. This biosphere reserve is located in the Nilgiris region in the southern part of two states, Tamil Nadu and Karnataka. The Nilgiris Biosphere Reserve includes the Nagerhole National Park, the Bandipur Tiger Reserve, the Wynand Wildlife Sanctuary, the Silent Valley National Park, and the Mudumalai Wildlife Sanctuary. The Mudumalai Wildlife Sanctuary includes part of the Nilgiri, or Blue Hills, one of the oldest mountain ranges on earth. It is home to the largest remaining population of Asian elephants in India, viable populations of tiger, panther, bison (guar), wild boar, sloth bear, deer, wild dog (dhole), jackal, hyena, as well as countless other smaller species. The diversity of avifauna and flora is equally impressive. Thorn, bamboo, tropical dry-deciduous, moist mixed-deciduous, semi-evergreen, and riparian fringe forests form microhabitats interspersed throughout the region.

Against this backdrop the India Project for Animals and Nature (IPAN) operates the Hill View Farm Animal Refuge, which provides veterinary care for over a dozen village and tribal settlements that lie within and around the Mudumalai Wildlife Sanctuary. IPAN works to improve the overall health of the domestic animal population by treating distemper, rabies, foot-and-mouth disease, black-quarter disease, scabies, and other health problems. Because rural South India's economy is livestock-based, our efforts to improve the health and welfare of domestic animals also have a direct and substantial impact on the health and welfare of the people. Improving the health of domestic animals also helps to check the spread of zoonotic diseases into the wild animal populations of the surrounding wildlife preserves. IPAN addresses this vital connection between domestic animal health and welfare, conservation, and public health, and works to improve the livestock-based economy of rural South India by promoting humane and sustainable husbandry practices.

IPAN also works within the Nilgiris Biosphere to educate farmers about basic animal care and disease prevention. Many farmers still treat open wounds with kerosene, DDT, and other pesticides in an effort to keep maggots from hatching. Others brand the legs of their cattle with red-hot iron rods, with the erroneous belief that it will help them become immune from black-quarter disease. These "country practices" are harmful to the animals and stem from ignorance as much as from a lack of any available, effective treatments and preventive measures.

IPAN also works to create humane education materials for school children, which teach them compassion and respect for all animals. When we treat animals in the villages, we teach compassion, by example,

to the groups of children that gather around to watch. Showing people that something can be done for the animals gives them hope and allows them to care, when previously they were fatalistically indifferent and appeared unfeeling.

IPAN also trains local authorities and officials about animal welfare law enforcement. An important first step in training and education is making people aware of the written laws in their own constitution that provide for animal and environmental protection. India has some of the strongest laws on record that address animal cruelty and environmental responsibility; sadly, these laws are rarely enforced, or are undermined by official indifference and corruption.

Indigenous Tribal Groups

Originally, the Nilgiris was home to several indigenous tribal groups, including the Todas, Kotas, and Kurumbas. These tribal groups lived in almost total isolation from the surrounding plains to the south, due mostly to the unique topography of the Nilgiris.

For thousands of years, these peoples lived amongst each other, eking out an existence firmly rooted in their pastoral, agricultural, hunting, and foraging activities. While no one group was able to provide all the necessary goods for survival, a complex set of intertribal relationships, known as *jajmani*, enabled each specialist group or *jati* to provide goods or services to each of the other groups in return for grain or tools. *Jajmani*, while primarily economic, also served to facilitate social and ritual exchange between the various tribes, dictating the ways in which two different *jati* groups would trade, interact, and support each other during major life events such as birth or death. But it went well beyond that. *Jajmani* delineated one group from the next, therein giving each tribe a distinct sense of self, purpose, and meaning.

The way that these tribal groups lived impacted minimally on the Nilgiris environment. The Todas were pastoralists and spent the majority of their time tending to their buffalo, which provided them with milk, curds, and ghee for their own consumption as well as to trade to the other groups for tools or grain. The Kotas were primarily artisans and musicians, offering these services for weddings and funerals in exchange for the same. The Kurumbas lived on the jungle edges of the plateau, subsisting as hunters and gatherers, as well as serving as “magicians” for the other groups, offering protection against spells and black magic from evil sources. The Badagas, the most recent group of arrivals, came to the region as refugees from Karnataka in the sixteenth century, quickly becoming the most populous group and serving as the main provider of foodstuffs to the other three groups.

The Colonial Era

The Nilgiris region remained relatively intact up until the British arrived in the early 1800s. British colonization and subsequent modernization set in motion a series of changes in the region, which are still playing out in various ways today. These changes have greatly altered the relationship between people, animals, and the environment. The British turned the cool hills of the Nilgiris into the summer administrative capital of Madras and the state of Tamil Nadu. Certain towns in the plateau area became “hill stations” or health and recreational resorts for Europeans in South India, and served as integral parts of the British imperial regime. As such, the area attracted a large influx of immigrant, nontribal Indians from the surrounding plains who were looking for work or for property.

Changes made under the British had far-reaching effects on the Nilgiris environment and the people who lived in it. Hunting blocks for trophy hunting were established in vast areas that had played a vital role in subsistence hunting and in foraging activities. The establishment of large tea and coffee plantations and the introduction of monocultures to raise cash crops required that huge tracts of land be cleared. Large numbers of settlers, who worked on plantations and who did not participate in the *jajmani* system of trade, slowly eroded the traditional agricultural practices and kinship bonds of the tribal peoples. The British were seen as a kind of *jati* cluster, the *kshatriya varna*, the social division of Hindu society whose members were traditionally warriors and rulers. As more and more social and economic activity came to involve the British *jati* group, traditional *jajmani* activity quickly declined. As tribal groups and the *jajmani* relationships that bound them together were weakened or lost, so too was the deep-seated respect for nature and animals. This replacement of one mind-set (sustainable, interdependent living) with another (market-driven, exploitative, unsustainable living) allowed the very sort of present economic and agricultural practices that are inexorably degrading and destroying the Nilgiris bioregion. The effects of these drastic changes would become readily visible over the next 160 years.

The Post-Colonial Era

In the Nilgiris region today the onslaught of modern ways, fueled by a market economy, has left the tattered remains of the *jajmani* system barely intact. The paradigm of Western industrialism, focused squarely on creating more and more jobs, exploiting the environment, and producing and consuming goods and services is incompatible with what environmentalist David Brower called “planetary CPR”—conservation, protection, and restoration of biological and cultural diversity. This incompatibility is nowhere so apparent as in the Nilgiris, where tribals are deciding whether to “go modern” or to maintain their traditional culture. Many have abandoned their traditional lifestyles and have adopted new lives as small businesspeople, farmers, or plantation laborers. Living their lives without the constraints, duties, and responsibilities of the old *jajmani* system is no doubt attractive to many of these tribal groups. Why conduct business affairs the old way when you can sell your goods or cash crops on the “open market” and buy any food or supplies that you need directly from the stores in town? The new ways may be easier and more attractive, but they exact a heavy price on social values and cohesion.

Cut off from the interdependent, supportive *jajmani* relationships, some of these tribals feel lost and alienated in this new world, with corresponding increases of spousal abuse, drug and alcohol abuse, and feelings of hopelessness and despair. IPAN staff often see Toda men selling their wives’ wedding bracelets at the Ooty bus stand for bottles of whiskey, a sad indicator of these same conditions. Interestingly, the decline of aboriginal culture parallels the destruction of wildlife habitat and the degradation of the Nilgiris ecosystem. While it may be impossible to reestablish the old *jajmani* relationships in the face of such drastic and far-reaching change, it is entirely possible to put a check on some of the behavior most detrimental to the tribals, and in so doing, allow them to recapture and retain some of the old value systems that define them and give them meaning. It is a question of reestablishing the links that have been severed by the massive translocation of lowland peoples, deforestation, large-scale irrigation projects, encroachment, and agricultural modernization.

The abandonment of traditional lifestyles for modern ones signals a profound shift in the way resources are both used and managed. Sustainable, organic agriculture and the cultivation of nutrient-rich, rain-fed

grains such as ragi, millet, and lentils have given way to the cultivation of rice and other cash crops that require tremendous amounts of water, often procured through illegal irrigation from rivers. This overuse of limited water resources has put a massive strain on the local rivers, which sometimes run completely dry at certain times of the year.

The Green Revolution, which boosted India's commodity crop production but undermined its already relatively self-sustaining agricultural base, introduced many high-yielding varieties that required increasing amounts of pesticides and fertilizers. This reliance on agritoxins, while beneficial in the short term to overall crop output, has had devastating effects on the health and vitality of the Indian agro-ecosystem. As the size of average land holdings is small, Indian farmers typically use a variety of pesticides on their crops, including DDT and cyanide, which expose soil, plant foliage, and many nontarget organisms to a potent pesticide "cocktail." Companies such as Monsanto have rushed to exploit this need in the Nilgiris. These companies post signs along major roads that tout Roundup as "The Herbicide." In return for increased water consumption and pesticide application to grow monocultures, land owners can sell crops at a higher price, but indigenous people are left with a significantly less healthy and varied diet. Pest resistance to pesticides, combined with a lack of adequate rainfall, has led to crop failures and resultant farmer suicides.

As the economic status of some local people improves, many adopt rice-based diets that they consider to be more sophisticated, an adoption encouraged by government ration cards for such produce. Ironically, nutrition studies have reported decreased stamina levels on nontraditional rice diets, affecting both health and ability to work.

One simple step toward sustainable agriculture would be the readoption of traditional diets, which would force a change back to the cultivation of nutritious, rain-fed grains and pulses. The return to organic farming methods would significantly lessen the overreliance on pesticides and herbicides, breaking the toxic chain that cycles through the air, soil, water, and foliage. Many of the tribals who have leased their land to others for cultivation have become cut off and locked out of the very same life-sustaining practices that have nourished them for millennia. Local initiatives to establish farming cooperatives might make hanging onto the land more attractive to the tribals than leasing it, and prevent a lot of the social dislocation that occurs as a result.

The destruction of *sholas* and the clearing of vast tracts of land for eucalyptus, tea, and coffee plantations have usurped much of the traditional grazing land and hunting and foraging areas of the tribal groups. The Todas used to graze their buffalo freely; now the land that they use is in some places hemmed in by plantations or farmland and is frequently encroached upon. Diseases such as foot and mouth are most likely spread by wandering scrub cattle and are threatening the last few remaining sacred Toda buffalo. The lives of the Todas revolve around their "temples," which are dairies. The sacred buffalo are milked at the temple in highly ritualized ceremonies. Without their sacred buffalo, they would be unable to conduct their temple rituals, and their culture and religious faith would collapse. IPAN recently treated and cured one of the six remaining sacred temple buffalo of one Toda community from foot-and-mouth disease. This clear-cut case shows that the protection of a rare breed of domestic animal is connected to the preservation of indigenous peoples. Artificial insemination programs may also help preserve traditional practices.

Wildlife Conservation Problems

Thousands of people have been permitted, with government blessing, to settle within the confines of the Nilgiris Biosphere Reserve. The presence of these people within the boundaries of the parks has had a profound impact on the health and vitality of this entire region. Settlers, domestic animals, and wildlife struggle to maintain a tenuous relationship together. All too often, the wildlife that resides within the boundaries of the reserve suffers either directly or indirectly from the activities of the people and their domestic animals.

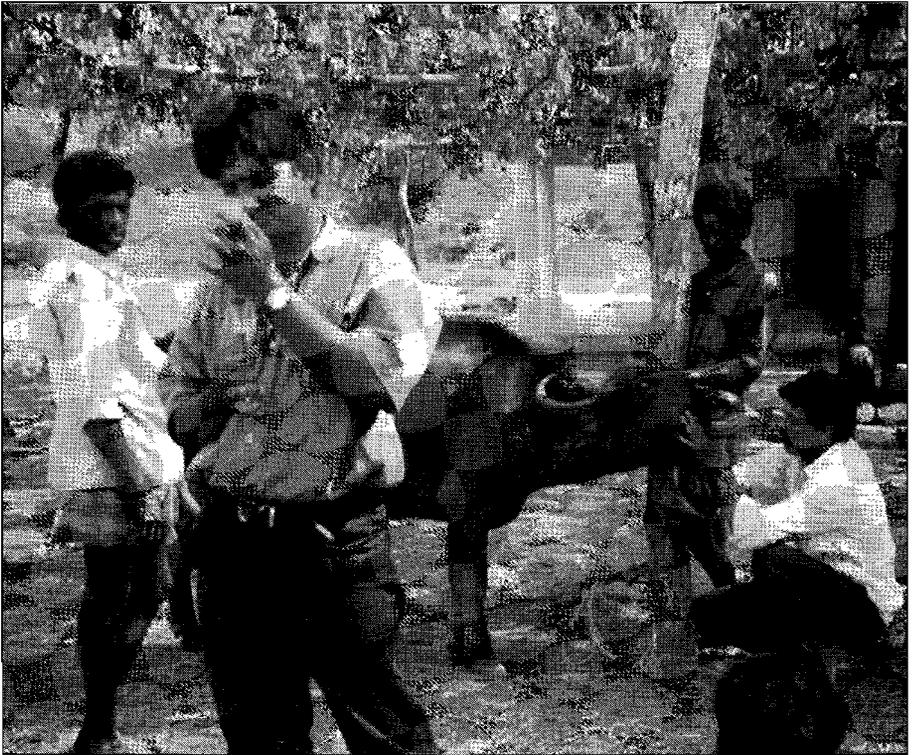
The settlers who live within the boundaries of the 673-square kilometer (260-square mile) Mudumalai Wildlife Sanctuary have certain resource restrictions placed upon them that they rarely abide by and that are rarely enforced. One of the most destructive activities is the collection of wood for fuel. Villagers are allowed to take a certain amount of fallen, dry wood out of the forests for their own use. With too many people and not enough fallen wood to go around, many people will destructively cut limbs off to dry out and then return later to remove them.

Two other major contributors to the depletion of the forests are tea plantations and illegal brick factories. The curing of tea and the production of bricks both require large amounts of heat, produced by burning wood fuel. The heat, though, need not come from illegally taken firewood. A viable alternative is to engage the tribal people and villagers in a "social forestry program," where trees for fuel would be grown in designated areas by groups of people who have a common interest in tending to their trees properly and not allowing any illegal cutting or removal. (This same model could be copied for growing cattle fodder, thereby preventing overgrazing.) The ongoing Tamil Nadu Afforestation Program, assisted by the Overseas Economic Cooperation Fund, Japan, is a good example of his type of cooperative effort, or "communitarianism." Not only does it provide fuel in a nondestructive way, but it also involves the people in a grassroots model of land reform and resource utilization that is ecologically sound and directly meets the needs of the people.

Another solution to the deforestation problem is for the government to subsidize kerosene reserves for people in ecologically sensitive areas. During kerosene shortages, entailing more tree cutting, the availability of inexpensive reserve supplies of kerosene would help prevent the destruction of forests. Empowering and educating indigenous people and motivating them to manage their natural resources in a responsible manner are vital seeds of change that must be planted now.

Cattle Issues

Cattle overpopulation is another of the most pressing issues facing India today. In the Nilgiris region, the presence of large number of cattle has a substantial impact on the overall quality of the environment and the lives of both people and wildlife. For those cows that are still able to produce milk and are kept within the confines of an owner's property, there is little damage being done. For the thousands of calves, bulls, and "spent" milk cows turned loose, the story is altogether different. These cattle are kept primarily for the dung that they produce, which provides a cheap source of fuel. The manure that is collected from the scrub cattle is illegally trucked out to other areas by bribing check-post guards. This doubly robs the land; first it is overgrazed and then the nutrients, in the form of dung, which should go back into the soil, are collected and trucked to the other areas for profit. Little income is derived from their skin and bones, which is all they are when they go to slaughter. The government has not allocated any specific, communal grazing lands for cattle, yet for a fee, people can graze their herds in parts of the reserve forest. IPAN treats and



India Project for Animals and Nature (IPAN) staff giving in-field treatment to buffalo, one of many domestic species that carry infectious diseases communicable to wildlife. PHOTO COURTESY OF IPAN.

saves many cows that are attacked by leopards so that less poisonous bait is set out to gain revenge on the wildlife.

Thousands of scrub cattle wander through the region, overgrazing the land and doing damage to sensitive riparian areas. Land that is overgrazed often grows back with inedible scrub plants, notably prickly pear cactus and lantana, which soon take over and prevent the regrowth of grasses, herbs, and other important land cover. In the dry season, there is insufficient fodder for the cattle population.

Notorious cattle drives herd thousands of cattle hundreds of kilometers to the neighboring state of Kerala for slaughter, with no provisions made for adequate food or water. For those cattle that do collapse, hot chilies and salt are rubbed into their eyes to make them get up and keep going. IPAN is working for humane and compassionate alternatives to these unacceptable practices.

Accurate cattle censuses are not conducted, so grazing fees are inaccurate. This leads to a chronic shortage of vaccines that are supplied for immunizations and help protect wildlife from livestock zoonoses. This makes the cattle more susceptible to disease and places wildlife at even greater risk. These fundamental inadequacies of government support for veterinary services to effectively prevent, control, and treat domestic animal diseases are a threat to both human and wildlife populations. This fact recently was driven home when two wild elephants in the area were found dead with clinical indications of foot-and-mouth disease.

Although the government has recently proposed an initiative to move all cattle outside of reserve boundaries, this is not the best solution to the problems at hand. It treats all cattle within the bound-

aries of the Mudumalai Reserve the same, even though their effects on the ecosystem are different, depending upon how they are husbanded and for what primary purpose. A feasible solution has been proposed by IPAN, namely the Masinagudi People, Livestock, Wildlife Sustainability/Compatibility Project. This initiative facilitates the removal of many of the scrub cattle from reserve land. It encourages a reduction in the remaining cattle population by introducing the high milk-yielding Sindi breed, but at the same time increasing milk production and manure collection. The key to this sort of program lies in engaging livestock owners in a grassroots conservation role that provides education and hands-on participation.

Dog Issues

Other activities are having a detrimental impact on animals in the region. Municipal authorities are still killing dogs in an effort to control disease (rabies) and population. Inhumane methods such as strychnine poison, electrocution, and the injection of Epsom salts or cyanide into the heart are a frequent public spectacle. Such cruel dog population control programs are a bad example to the children who watch, teaching them that it's all right to abuse animals. In addition to being inhumane, these methods have been shown to be completely ineffective in controlling disease and dog numbers. Outside of IPAN's program, there are no established, consistently administered spay/neuter or vaccination programs in the Nilgiris region, an area with an estimated 6,000 to 8,000 dogs. The spread of scabies, rabies, and distemper continues, a threat to the people who live there as well as the wildlife. The spread of disease can also occur when diseased village dogs feed on the carcasses of deer, exposing vulnerable wildlife. The recent suffering and decimation of the lion population in East Africa from distemper contracted from Masai dogs illustrates the harmful consequences that can result when the health and welfare of domestic animals are not considered by conservationists.

This gaping void in dog health and population control in the Nilgiris has been admirably filled by the hard work and dedication of IPAN. In the past two years, IPAN has spayed and neutered over 400 dogs in the Mudumalai area and has administered community-wide inoculations of dogs against rabies and distemper. IPAN staff have intervened on a number of occasions when gypsies with scores of dogs walk, carry, and drag them through the wildlife sanctuary en route to Karnataka, where they are sold to farmers and tied up in fields to bark at hungry, crop-raiding monkeys. Many are sick with mange, distemper, and other diseases communicable to wildlife. The local police must check the activities of these dog butchers. One solution is to employ tribals as forest and plantation watchers, both alleviating the need for guard dogs and providing much-needed income for the tribals themselves. The ban on journeying livestock on foot through the Mudumalai Wildlife Sanctuary in order to prevent the spread of disease should include dogs.

Tourism Issues

Construction of guest lodges in the Mudumalai area by wealthy Indians continues apace. The lodge owners, in an effort to cater to their guests (who often have an "I'm away from home, anything goes" mentality) have allegedly provided drugs, alcohol, and prostitution services, a blight on the local communities. Some report that lodge owners serve the meat of illegally killed spotted deer from the wildlife reserve to their guests. Four- to 6-hectare parcels of land are sought after for these guest lodges, often with no regard for the ecological sensitivity of the region. They are in some instances built directly on top of vital corridors that link elephant and other wildlife habitat, disrupting the physical flow of the animals as

well as the gene flow between different pockets of wildlife. The lodges and the visitors they attract fragment the land and push wildlife into more undesirable areas, where they come into increased conflict with farmers and villagers. Two resort lodges and a tea shop, half constructed, have been stopped by local authorities—a positive sign.

Illegal neck snares (or snooses) set out for deer often catch wandering scrub cattle and cause slow, painful deaths. Since resorts, guest lodges, and rich landowners engage tribals to supply clients with venison and other wild game, more and more snooses are being used in the reserve forests behind IPAN's Hill View Farm Animal Refuge. Sustainable culling of wildlife for personal consumption has given way to unsustainable, exploitative killing for profit.

New guest lodge construction must be prohibited to ensure that wildlife is not affected by excessive tourism. Policing the area for illegally strung electric wires and snooses and fining all miscreants will help deter similar behavior. In some cases, it may be necessary to relocate people who have settled in wildlife corridors, or to demolish buildings that impede the natural flow of animals.

Elephant Issues

The present elephant situation in The Mudumalai Wildlife Sanctuary, home of the largest Asian elephant population in India, is dire indeed. Little cover remains for the magnificent elephants as habitats shrink and become fragmented—a situation that is exacerbated by encroachments and unabated habitat destruction from mining, agricultural, and resource collection activities. To prevent crop raiding by so-called “rogue” elephants, many farmers in the region illegally tap electric lines and erect 400-volt wires around their plots. Several elephants have been killed by these fences. The corridors linking remaining habitats, which enable the elephants to move about unimpeded, are being encroached upon and cut off. This frustrates the breeding bulls' natural propensity to move about and impregnate various females in different parts of the reserve.

The number of “tuskers,” full adult males with tusks, is declining rapidly as poachers, aided by a lack of effective forest protection, have a field day slaughtering these bulls for their tusks for the overseas and black markets. Poachers who recently shot one forest guard, are reportedly well-armed and are targeting younger males as the number of adult tuskers has plummeted. Shooting, poisoning, electrocution, and harassment of crop-raiding rogues by farmers has thinned out the elephant population even further and has led to increased incidences of human-elephant conflicts. As a result of all these combined factors, the male-female ratio is now so lopsided and the viability of the remaining gene pool so poor that it is feared the elephant population may never be able to recover.

One feasible and potentially very effective method to combat poaching is to introduce the genes of tuskless elephants into the remaining Nilgiris herds. It has been found in Uganda that an increase in the number of tuskless elephants has led to a decrease in poaching. The large number of tuskless elephants that were spared the poachers' guns has also ensured that the survivors passed their genes down through the generations.

Another way to combat the poaching problem is to hire tribals as forest guards. This move, though, has been and will continue to be ineffective so long as they are not given adequate support or pay. Nontribal forest guards, police, and other officials are inadequately equipped to deal with poachers and are easily bribed. Some participate in various unlawful activities that undermine efforts to protect wildlife and habitat. For example, they use force to suppress local people's complaints and reports and participate in disinformation campaigns (as they have against IPAN)

when “outsiders” know too much. Concerned individuals and investigators have been subject to death threats, lawsuits, fabricated criminal charges, and have been beaten and sometimes killed, as one Indian journalist and one forest guard were in 1997 to 1998.

Nilgiris Biosphere CPR (conservation, protection, and restoration) will be impossible so long as these local problems are denied and covered up. Forest guards need vehicles for patrol work, guns to protect themselves, and radios to contact the Forest Department and local police when poachers are seen. Unfortunately some hunters, according to tribal informants, are high-ranking officials and rich industrialists who are immune to the law. Giving forest guards more pay, though, will not make them bribe-proof. A better incentive would be bonuses and promotion when poachers of wildlife and forest products, notably sandalwood, are caught. This would go a long way toward boosting the morale of the guards whose job it is to protect the dwindling number of elephants in the Nilgiris.

Recommendations

Despite the extensive ecological damage wrought on the Nilgiris bioregion by agricultural modernization, the driving forces of a market economy, and local greed and graft, it is still an area very much worth fighting for. It is a relatively rural, remote area with a low population density and a high potential for ultimate recovery. The solutions, to be sure, lie in acknowledging the problems first and then moving swiftly and with the proper resources to solve them.

The recommendation of IPAN is to redesignate the Mudumalai Wildlife Sanctuary, which is part of the larger UN Nilgiris Biosphere Reserve, as the first Biocultural World Heritage Site, where the indigenous people who choose to live in traditional, sustainable ways are encouraged and given the right support. Indigenous peoples generally see that their future, their culture, traditions, and values, are dependent upon securing the future for wildlife and the wildlands because they themselves have sustainably coevolved and are therefore codependent. Revitalizing such a mutually enhancing symbiosis would be the primary objective of the Nilgiris Biocultural World Heritage Site. A Nilgiris Biodiversity Institute would offer comprehensive training in applied technology, conservation, and land use programs. Teaching local people the necessary scientific knowledge would streamline conservation efforts. Grassroots initiatives are the most effective because they engage the people most interested in seeing that those same initiatives succeed. Local people also have an intimate knowledge and understanding of the land, forests, and animals that they have lived on, in, and among for thousands of years.

Forest tribals should be enabled to manage forest resources, including wildlife. They need to be funded, equipped, and properly advised and supervised by a more conciliatory Forest Department and Wildlife Authority.

Tribals are not only good trackers and wildlife spotters for tourists, they would also be the best guards for elephants, tigers, and other wildlife. Let each community profit from the parts of dead and dying wildlife; for example, harvesting elephant ivory, bear claws, and tiger bones from long-monitored and respected old-timers who die in their jungle and forest domain.

A Biodiversity Cultural Center for ecotourism would provide environmentally friendly alternatives to the guest lodges now being built. Tribal cooperatives would be established, selling sustainably collected forest produce as well as local arts and crafts for the tourists. These cooperatives would provide much-needed income for the local people, and simultaneously nurture and protect the “old ways” most at risk from modern change.



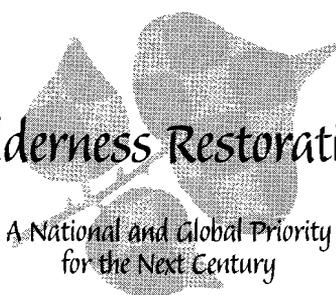
India Project for Animals and Nature (IPAN) Consultant Dr. Michael W. Fox treating a monkey.
PHOTO COURTESY OF IPAN.

Recognizing that the marginalization of tribal peoples, the poisoning and destruction of the environment, the loss of wildlife and biodiversity, and overexploitation for profit and greed are all interrelated parts of the same puzzle is an important first step toward creating solutions for some of the problems facing the Nilgiris. Several substantial obstacles remain, however, to making headway and enacting positive change in this region. What people do to “save face” when they are confronted by their own duplicity, indifference, and denial hinders conservation seriously, as well as animal protection and human rights efforts in many countries. It illustrates how progress in these areas, including the application of bioethics, is extremely limited when there is a lack of moral integrity. Foreign money coming into India without grassroots oversight can be most destructive in regions where nefarious activities are the main currency.

Perhaps the most difficult hurdle is convincing the local people to start working with long-term approaches rather than with short-term ones. This vital shift in thinking, which can only be achieved by first demonstrating viable socioeconomic alternatives to the people, and then allowing them to adopt these benefits for themselves, will motivate the human population of the Nilgiris to work cooperatively. The realization that their own interests are best served through the careful stewardship of natural resources as well as through the good husbandry of their domestic animals is “enlightened self-interest.” In order to responsibly exercise their freedom of self-determination, they must be liberated from the spiritually corrupting forces of materialism, poverty, and greed. These

forces amount to a genocidal and ecocidal extinction process. If indigenous peoples and wildlife are to coexist and the extinction of both be averted, then the people and authorities responsible for forest resource management, land use patterns, and wildlife protection must develop a shared vision, one that is economically viable, socially just, and ecologically sound.

Furthermore, it must have a functional, bioethical infrastructure of conservation, protection, and restoration of both biological and cultural diversity. The expedient alternative of removing all human residents from critically endangered bioregions is ethically questionable and may not be prudent in the long term. Indigenous knowledge and presence could be of inestimable value in optimizing conservation, wildlife protection, and habitat restoration.



Wilderness Restoration:

*A National and Global Priority
for the Next Century*

Alan Watson Featherstone

If we look at the most commonly used photograph of the earth taken from space, the most prominent feature on it is desert. Although deserts are natural ecosystems on the planet, much land has become desertified as a result of human activities. This is particularly true in North Africa, in the Mediterranean coastal zone, most of which was forested in Roman times, and in the Sahel region, south of the Sahara. More recently, Madagascar has suffered extensive deforestation and widespread erosion, with only 20 percent of its original area of rain forests still surviving. This photograph of the earth from space is a potent symbol for the environmental destruction currently taking place on the planet.

Most environmental projects and campaigns focus on stopping this destruction from occurring, whether it is desertification, clearance of the tropical rain forests, or the hunting of endangered animals (e.g., rhinos). However, even if all such environmental degradation were to stop immediately, the planet's ability to support its full complement of biota is substantially impaired and reduced, due to the damage that has already taken place.

We live in a world that has been grossly impoverished in terms of the population sizes of most large species of fauna and the reduction of most major habitat types. Furthermore, the current focus on industrial and consumer-based culture enslaves the planet.

The chart shows the effects of human exploitation and population increase on selected other species and habitats. This chart mainly covers North America, as the destruction is more recent there, and data on preexploitation levels exist, unlike for Europe. Species populations and habitat extents are now tiny percentages of their original sizes, and a similar situation holds true for other continents and species (e.g., blue whales, tiger, etc).

To date, the main thrust of the conservation movement has been to protect wildland and species by establishing national parks, wilderness areas, and other protected areas. The lead for this has come mainly from the United States where Yellowstone, the world's first national park was established in 1872, and which now has one of the most comprehensive systems of protected areas in the world. However, recent studies show that the substantial areas protected in the western United States are inadequate to maintain all their constituent species.

Protecting the remaining undisturbed wild areas of the planet is not enough to ensure the survival of other species, particularly the charismatic megafauna—large mammals such as grizzly bears and tigers—which require large habitats. This should not divert efforts to achieve protection for extant wild areas. These areas provide an essential component to a global strategy of sustaining the biota and biological integrity of the planet. However, two other elements need to be added to such a strategy to make it effective—connectivity and ecological restoration.

Decline of selected species and habitats world wide
because of human pressures

Species	Original population	Today	% Now
Tiger (Asia) ¹	100,000 (1900)	5,000	5 %
Black wildebeest (Africa) ²	100,000 +	1,800 in 1965	1.8 %
Muriqui (Brazil) ³	400,000	386 in 1987	0.1%
Kauri Forest (New Zealand) ⁴	12 million hectares	4,000 hectares	0.3%
Juan Fernandez fur seal (Chile) ⁵	3.5 million ?	2,500	0.07 %
Sumatran Rhinoceros ⁶	1,000 in 1985	400	40% after 10 years
Southern right whale ⁵ (Southern oceans)	100,000 + in 1800	3,000 in 1970s	3 %

Sources: 1. World Wide Fund for Nature (WWF). 2. Burton, John A. & Pearson, Bruce 1987 *Rare Mammals of the World*. Collins, London. 3. Quammen, David 1996 *The Song of the Dodo*. 4. Sole, Steve 1997 *NZ Wilderness*. 5. Burton, John A. & Pearson, Bruce 1987 *Rare Mammals of the World*. Collins, London. 6. International Rhino Foundation.

Connectivity, using habitat corridors, links areas of wildland, which individually may not be large enough to support all their constituent species, but together may sustain viable populations of large mammals. Ecological restoration allows degraded ecosystems to rehabilitate and to regain wilderness characteristics.

Wilderness restoration may at first seem like a contradiction in terms—if wilderness means that the land is free from alteration by humans, and restoration implies active management by humans. Our planet can be viewed as behaving like a self-regulating organism that exhibits homeostasis—the state of constancy in which living things hold themselves when their environment is changing.

Indeed, like individual organisms, which display the ability to heal their wounds, so does the earth. For example, after the volcano Krakatau in Indonesia erupted on August 26, 1883, vegetation, insects, birds, and animals recolonized the remnant island, which was blanketed with cinders and lava. More recently, the area devastated by the eruption of Mount Saint Helens in the United States in 1980 and the area burned in the fires in Yellowstone National Park in 1988, are also providing living laboratories of how parts of the biosphere heal after catastrophic disturbance.

Ecological restoration, a natural process, provides an example of homeostasis in action on the earth, but one often prevented from taking place by the scale and extent of present-day human activities. In the Argentinean part of Tierra del Fuego, for example, introduced cattle are grazing in areas of burned forest, preventing their regeneration.

Scotland provides a sobering example of degraded, formerly forested ecosystem unable to recover because of continued human exploitation. In the Highlands, the native pinewoods of the Caledonian Forest, characterized by the Scots pine (*Pinus sylvestris*), originally covered an estimated 1.5 million hectares, but have now been reduced to about 17,000 hectares. Figures 1a and 1b illustrate the estimated original range of the native pinewoods and the surviving remnants.



Caledonian Pine Forest, Glen Affric, Scotland. PHOTO COURTESY OF ALAN WATSON FEATHERSTONE.

Gone with the trees are all the large mammal species—beaver (*Castor fiber*); wild boar (*Sus scrofa*); lynx (*Felis lynx*); moose (*Alces alces*); brown bear (*Ursus arctos*); and wolf (*Canis lupus*). Most other species have either declined in number (e.g., pine marten [*Martes martes*]; red squirrel [*Sciurus vulgaris*]) or in size—the red deer (*Cervus elaphus*), our largest surviving terrestrial mammal, has been forced to adapt from its natural forest habitat to life on the bare hillsides, where it only reaches three quarters of the size it did in former forested times.

Although fragments of forest do survive grazing pressures from large numbers of introduced sheep and an artificially high population of red deer (maintained by large landowners for sporting interests), the regeneration of any native forest in most areas has been prevented for over 150 years. With the mature trees in the forest remnants dying of old age and not being replaced by a new generation, time has almost run out for the Caledonian Forest.

This is critical not just in a national context but also internationally. Although Scots pine has a wide distribution, stretching from Scotland and Spain through central Europe and Russia to Siberia, and from north of the Arctic Circle to the Mediterranean, the pinewoods in Scotland are unique because of the absence of any other conifers in them. Elsewhere the Scots pine is associated with other trees (often Norway spruce [*Picea abies*]). Ecological restoration measures are essential to bring the land in the Highlands back to a condition of health again, where it can support its extirpated native species.

Trees for Life has been developing a strategy for the restoration of the Caledonian Forest since 1985, and we have been implementing this in practice since 1989, in partnership with major organizations in Scotland, such as the Forestry Commission and the National Trust for Scotland.

Some measures to help the forest regenerate have been undertaken in the last thirty years. Deer and sheep have been fenced out of forest remnants, and a new generation of trees has grown successfully.

However, these initiatives have been relatively small in scale, uncoordinated, and have focused solely on the trees, often just the Scots pine. Our work is concerned with the entire forest ecosystem, and our goals include restoring the forest to a large contiguous area of about 1,500 square kilometers (illustrated in figure 1b), and reintroducing the extirpated species of wildlife.

We have a threefold strategy for expanding the extent of native tree cover, recognizing that this is an important initial step in the restoration of the whole forest community. The first part of our strategy is to facilitate the natural regeneration of the trees by fencing the deer out of areas on the periphery of the existing remnants, so that seedlings can grow naturally to maturity without being overgrazed. This is the simplest and best method of regenerating the forest, as it involves the minimum of intervention and allows nature to do most of the work. This forms one of the basic principles of ecological restoration, which underlie our work. However, this is only effective in locations where there is an existing seed source nearby, which is not the case in the treeless expanses that make up most of the Highlands today.

The second part of our strategy comes into effect in these situations, and it involves planting native trees in barren areas where the forest has disappeared completely. To do this, we collect seed from the nearest surviving trees to maintain the local genetic variation in the forest. The resulting seedlings are then planted in a random, nonlinear pattern inside fenced enclosures, replicating the natural distribution of the trees. We are working with all of the native trees from the forest, and are paying particular attention to the pioneer species, such as birch, rowan, and aspen, as they have an important role to play in the succession of the forest as it gets reestablished.

The third part of our strategy involves felling of nonnative trees, which in some areas have been planted as a commercial crop amongst the old trees of the Caledonian Forest remnants. Nonnative trees prevent the regeneration of native trees and understory vegetation. These felled exotics are not extracted, but instead are left to decompose in situ, so that the nutrients they contain are retained within the forest ecosystem.

Combining these three strategies, our intention is to reestablish areas, or islands, of healthy young forest scattered throughout the barren, deforested glens. As these new trees reach seed-bearing age they will form the nuclei for an expanded natural regeneration in the surrounding area. While the trees in these islands are growing, it will be important to reduce the numbers of deer, so that the forest restoration process can become self-sustaining without the need for more fences. At that stage, we expect that the existing fences can also be dismantled and removed, so that the human intrusion into the landscape can be minimized, and more of a quality of wilderness restored.

As the trees grow, some of the other woodland species will return by themselves. Seeds will be blown in by the wind or carried in by birds, and flying insects and birds will move in as soon as there is habitat for them. The interconnected web of life, which makes up the living community of the forest, will begin to reestablish itself. Other species will need to be physically reintroduced into the regenerating forest, as and when the habitat can support them. In the long term, we plan to reintroduce all the locally extinct large mammals. Those species, and particularly the predators at the top of the food chain, such as the brown bear, lynx, and wolf, are essential to maintaining the overall health and balance of the forest ecosystem. This will need to be accompanied by an education program to counter public fears and misconceptions about predators. Compensation measures should be instituted for any livestock losses that result. We can learn from the current reintroduction program for wolves in the United States.

In practical terms, since 1989 we have organized and funded the fencing of 159 hectares of land in Glen Affric for forest regeneration and restoration; planted over 100,000 Scots pines; developed a propa-

gation program for aspen from root cuttings as it almost never reproduces by seed in Scotland now, and have successfully grown over 1,000 trees by this method; and we are also propagating all the other native trees from the forest ecosystem. Current projects include initiatives to secure the restoration of specific components of the forest ecosystem, particularly riparian vegetation and the montane shrub community.

We have also organized several scientific studies to evaluate aspects affecting the restoration of the forest, including research into the role of mycorrhizal fungi in forest establishment; habitat requirements and population densities of wood ants (*Formica aquilonia*), which are found in association with native pinewoods; and the rate of regeneration in browsed pine seedlings after the grazing pressures are removed. Through research such as this we hope to document the effectiveness of various restoration techniques so that they can be applied elsewhere.

In contrast to most other forms of human management of nature, ecological restoration is based on the principle that nature knows best, and in practice we seek to mimic natural processes wherever possible. Through the practical experience we've gained, we've articulated a series of principles which underlie our work of ecological restoration. These are not intended to be either exclusive to Trees for Life, or exhaustive—rather they represent a work in progress as we proceed.

Ecological restoration is now becoming well established as a field of research and practice, with numerous projects underway in different ecosystems and countries. Some of these initiatives include restoring dry tropical forests in northwestern Costa Rica, restoring mangroves in Vietnam and Thailand, and ecologically restoring Nonsuch Island in Bermuda. Recently proposals have been made to restore prairies in the Midwest of the United States.

The survival of many species on the planet depends on the ecological restoration of wilderness becoming the single most important activity of humanity, one that requires major resources. Indeed, in the early 1970s Richard St. Barbe Baker, the visionary founder of Men of the Trees (now renamed the International Tree Foundation) was calling for the armies of the world to be redirected to tree planting work to help reforest the degraded fringes of the Sahara Desert. The work of Trees for Life, and of many other pioneering ecological restoration projects, can be viewed as developing the principles and practices of helping the earth to heal.

I believe this is only a prelude of things to come, and that in the next century ecological restoration will become a national goal in every country, and indeed the global priority for all humanity. This view is shared by an increasing number of people: Wilderness recovery, I firmly believe, is the most important task of our generation. We must become active participants in the restoration of the earth. In restoration forestry lies the hope of the world and of humanity.

In order to achieve restoration on this scale, so that global biological diversity can be maintained, we have launched an initiative to have the United Nations declare the twenty-first century as the Century of Restoring the Earth. It will take at least 100 years to heal the wounds we've inflicted on the planet, and such a declaration would act as a catalyst for the necessary resources to be committed to ecological restoration.

For wilderness restoration and the other two complementary strategies for preserving the planet's full complement of biota to be effective, major changes in the individual and collective lifestyles of humanity must occur. Only through radical changes can our culture successfully make the shift from one fixed on the enslavement of the planet to one that revitalizes the earth. Embarking on a path away from mass extinction will require a radical departure from deeply embedded policies and land use practices.



The Earth Restoration Corps

Vance Hartke

When I was about fifteen, I experienced a lot of changes. I got my driver's license. I was dating. My life seemed good, but incomplete. That summer my family and I drove down to Florida to see the Everglades. On the drive my father told my brother and me of his summer in 1958, which he spent in this ancient swamp. He told us about the park rangers who taught him about the biological rhythms of this vast wetland. He attempted to impart to us this intimate connection to nature. He told us about the anhinga, a bird that swims underneath the water to catch fish. He told us about the alligator holes and how other animals depend on them during the dry season. He told us of the turtles, the red-eared sliders, the soft-shells, and the mighty snappers. He spoke of the strange and alluring sound of the wind over this slow-moving River of Sawgrass, as the Native Americans called it.

When we got there everything was just as my dad had said. The Everglades were majestic, even awe inspiring. However, the Everglades that my dad remembered had shrunk. What remained had the same aura and power to amaze, but there was less swamp.

New park rangers explained the enormous mismanagement of the water and the encroachment of agriculture. At the time I didn't fully understand the great interdependence of life, but I knew that strangling this great swamp would hurt me in ways I couldn't really explain.

In retrospect, I can look to that experience as a change in my consciousness. A change that was sparked by nature. A change that in time taught me the environment and all of its creatures, plants, and microorganisms have their own intrinsic worth, their own sacred and special place in creation. I had felt in my heart what Albert Schweitzer called "the noblest instinct of them all—the reverence for life."

I now feel blessed, because I have the opportunity to grant these feelings into action by working for internationally respected environmental leaders who have created the Earth Restoration Corps, the ERC, to protect and restore our wounded earth. When Hanne Strong, the founder of the Earth Restoration Corps, witnessed the degradation of the great ecological systems, she was appalled, both regarding the impact on the earth as well as the impact that this loss would have on young people. As one source of hope, she saw the wisdom manifested in the traditions of indigenous societies.

"As conscious revolutionaries," Hanne Strong declares, "we need to focus on two key problems affecting us in these critical times: environmental destruction and the loss of the next generation." These two major issues are directly linked. The solution is to provide the next generation with a way to reconnect with the earth and the cosmos as well as the tools to restore the earth and themselves. The fundamental context of the Earth Restoration Corps is a sense of urgency. As Hanne Strong says, "Time is running out and we can no longer wait for an evolution of consciousness." We are, indeed, past the luxury of evolution; a revolution is necessary. We need, in fact, a conscious revolution of the conscience.

The principal insight that motivated Hanne Strong to create the Earth Restoration Corps was the realization that “the disastrous events we are currently experiencing in the environment and society are an outward reflection of the imbalance inside ourselves.” From Hanne Strong’s perspective we must offer the next generation other ways to explore the meaning of being human on this planet other than the materialistic lifestyle that past generations have embraced. We must provide new ways to earn a living other than working for national and multinational corporations, who exploit the laborer and plunder the earth’s natural resources in return for excessive profits. We must provide the youth with opportunities to become aware of our inherent connection to the earth. We then need to help and encourage them to embrace the importance of knowing and living according to the Natural Law, including the Law of Cause and Effect, and the Law of Interdependence.

It is a simple matter to observe the correlation between cause and effect. If we are greedy, we do not hesitate to exploit the world. If we are peaceful inside, we will not create chaos outside. Our internal environment, our minds, and our external environment, the world, are intimately interrelated. We choose to discount a basic Natural Law, which is to never take more than you need and always give something back. Presently, we take from the earth and return these gifts with garbage and poison.

Like all movements, we need inspirational music, the connections felt in rituals, the hope and happiness found in our kinship with all creation. Thanks to the historic Earth Summit of 1992, a comprehensive practical agenda for the twenty-first century and beyond has been set forth by the largest assemblage of world leaders in history. This summit gives specific guidance on sustainable living with the entire biological community of life. Thanks to the Earth Charter, under the leadership of Maurice Strong and Mikhail Gorbachev, people in every country are working to produce a document that defines the values that are indispensable to a sustainable, just, equitable, and humane world.

Thanks to old rituals newly embraced, such as Dahn Hak, an ancient Taoist ritual now practiced in Korea, people are learning to use meditation, dancing, music, and exercise to connect to a cause higher than their mere individual interests.

And thanks to Earth Day, average people, many of them young people, have gathered in the largest demonstration in history, to proclaim their love of the earth and their demand for accountability and responsibility. In fact, on April 22, 2000, Denis Hayes, the father of Earth Day, is planning for international activities that will reach into every community in the world. All of these immensely important events and activities are sizable ingredients in any successful recipe for survival of nature and civilization. The Earth Restoration Corps is trying to do its part by training young people about sustainable living, by teaching rituals and songs, and by providing wilderness experiences. But, most importantly, in the words of John Hoyt, “We will seek to help effectuate, in partnership with others, a fundamental shift in the way people perceive the Earth and their relationship to all living things.”

If we wish to remove the sense of drift and loneliness that so many young people feel, then we need to offer them an embracing, engaging, and sustaining philosophy that awakens a reverence for all life. After all, in the land of A. C. Bose, the father of Indian science, and in the land of Mahatma Gandhi, a basic sense of empathy—seeing through the eyes of another, whether human or animal—is clearly a universal ethic.

Let me summarize with an Albert Einstein quote:

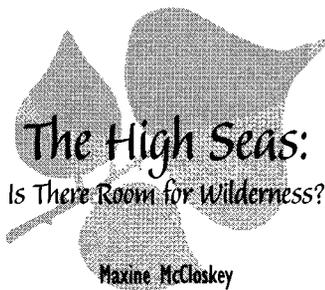
The more knowledge we acquire, the more mystery we find. A human being is part of the whole, called by us the Universe, a part

limited in time and space. He experiences himself, his thoughts and feelings as something separate from the rest ... a kind of optical illusion of his consciousness. This delusion is a kind of prison for us, restricting us to our personal desires and to affection for a few persons nearest to us. Our task must be to free ourselves from this prison by widening our circle of compassion to embrace all living creatures and the whole of nature in its beauty. Nobody is able to achieve this completely, but the striving for such achievement is in itself a part of the liberation and a foundation for inner security.

SECTION V



*Water
Wilderness*



Water is the basic stuff of this planet. No life can exist without it. In fact, life originated in the marine environment most likely in the cells of bacteria found in deep-sea hydrothermal vents. It is essential that the world's people pay attention to the oceans, respect them, and protect them from despoliation. We should be good stewards of land, air, and water for our own survival and for the future of the planet and all life on it.

Facts about the Marine Environment

To review some basic superlatives about the marine environment, it should be noted that approximately 70 percent of the earth's surface is covered by salt water. This planet should be named oceanus rather than earth. Scientists tell us that not only did life originate in the deep, but that more species of life occur in the oceans than on land, and also that marine biomass might rival or exceed that of all surface life. The deepest places on this planet are the ocean trenches. The Challenger Deep in the Mariana Trench (east of the Philippines) is the deepest at 11,022 meters and stretches for 2,500 kilometers. It is 20 percent deeper than Mount Everest is high. There are nine trenches over 6,700 meters deep. The Aleutian Trench in the North Pacific is the longest. The trenches can be considered inverted mountains. The lengths of underwater marine mountain chains also exceed those on land. A total of 75,600 kilometers comprises all the ridges and rises that encircle the globe.

These facts give a feel for the enormity of the marine environment. Special as well as representative areas in the oceans merit protection under some kind of international system. The long-range future of life on this planet requires it.

Marine Values

Geographic, physical, and biological features of the high seas grip our interest. Chemosynthetic life flourishes on the deep seafloor environment of total darkness, incredible pressure, extreme cold, but with astounding heat gushing up from hydrothermal vents. Vulcanism spews forth red-hot magma that wells up from deep within the earth's crust, creating new earth and rich mineral deposits. Various forms of thermophilic bacteria thrive in the abyss.

For thousands of years humans have relied on the seas for transportation. Not many years ago the high seas, especially the mid-waters and the seafloor, were considered to be biological deserts because practically nothing was known about them. This is part of the reason why it seemed acceptable to dump refuse and toxins into the oceans. Besides, anything dumped or spilled was quickly out of sight. Now we know that the high seas clear down to and under the seafloor support mysterious and bizarre life forms,

including gelatinous fish, giant clams, shrimp, and tube worms. Many of these creatures are bioluminescent. It is a whole new world waiting for discovery and research.

Here are a few examples of the kinds of marine features on the seabed, in the water column, or at the surface of the high seas that merit protected status:

- Places of vast plankton blooms or vast swarms of krill
- Sargassum beds and mats that are habitats for migrating sea turtles and eels
- Calving and feeding grounds of great whales
- Nursery areas of great and small whales and other marine mammals
- Routes of highly migratory species
- Critical areas for significant pelagic fish species
- Geological features of unusual scientific interest, such as at current convergence zones
- Tectonic rifts, geothermal vents, volcanoes, ridge crests, and deep trenches
- Seamounts and guyots that support rich biological communities
- Deepwater corals
- Areas of unique biological concentrations
- Areas of endemism
- Essential habitats of threatened or endangered species
- Edges of ice packs
- Representative areas
- Archaeological and cultural features

Threats

This watery world, despite its vastness, is under threat from many forms of human activity. The most serious and immediate threat to retaining viable biodiversity comes from overfishing and use of destructive fishing methods. Burgeoning human populations have increased the demand for fish. Inadequately regulated or enforced fisheries cause certain fish populations to crash (75 percent are in or are verging on a state of collapse). This generation and those of the future are deprived of those benefits of the sea, and biodiversity is impoverished.

Who could have predicted that the incredible populations of cod (*Gadus morhua*) in the northwest Atlantic Ocean would become commercially extinct? They are. This seems to be the same fate of the orange roughy (*Hoplostethus atlanticus*) and the Patagonian toothfish (*Dissostichus eleginoides*) in southern ocean waters; both species are being hunted voraciously. Some shark and billfish populations are severely reduced, as are the populations of the enormous bluefin tunas. Seabirds and sea turtles are also severely impacted by commercial fishing. Those animals at the top of the marine food chain succumbed quickly to intense hunting pressures, driving some species to biological extinction, for example the Biscayne right whale (*Eubalaena glacialis*) and Steller's sea cow (*Hydrodamalis gigas*). Most other populations of the great whales were so severely reduced by hunting, while under mismanagement by the International Whaling Commission, that after years of protection, some of them have barely begun to recover. The blue whale (*Balaenoptera musculus*)—the largest animal to have ever lived on earth—is just one example.

Destructive fishing practices, like factory trawlers that scrape the seafloor, purse seines for catching tuna that also caught hundreds of thousands of dolphins in the Eastern Tropical Pacific, and fine filament drift nets that are practically invisible to all marine life and can be 48 kilometers long, contribute mightily to

severe reduction of biomass and biodiversity in marine waters. By-catch is another major problem in that juveniles of the target species, other fish species, diving seabirds, marine mammals, and sea turtles are all victims in the rush to mine the seas of their living bounty.

There is a research project underway to test the feasibility of injecting into the deep seabed millions of tons of carbon dioxide (CO_2) that would be captured from the flue gases from coal-fired plants. This process has been proposed as a mitigation option for the amelioration of global warming thought to be associated with increasing atmospheric concentrations of CO_2 . It is presently estimated that under-sea storage would take 200 years before the chemical is fully absorbed by the ocean.

When mining of seabed deposits of metaliferous ores begins, the techniques now known will totally disrupt the seabed. Hydrocarbon extraction is already underway. Ocean dumping of refuse and toxic substances either deliberately or by accident continues even though the International Maritime Organization has drawn up regulations to control it. Sunken nuclear ships are leaking. Industry and pharmaceutical companies have expressed great interest in taking bacteria and other organisms from the hydrothermal vents.

Protected Areas on the High Seas

Just as there are systems of protected areas on land that ensure preservation of special geographic, biotic, and historic features, a similar system can be applied to special features of the marine environment. Many coastal nations have established marine protected areas (MPAs) within their waters of national jurisdiction, up to the limits of the Exclusive Economic Zone (EEZ), usually 200 nautical miles from shore. The number is at least 1,300 worldwide, including fifteen in the central Indian Ocean. Most of these marine reserves are located in the near coastal waters. Only a few are located far from land. Australia is studying a proposal that a group of seamounts south of Tasmania merits protection. This area could be Australia's first deep-sea marine protected area. Canada has selected two new pilot MPAs off its Pacific Coast: Endeavour Hot Vents, some 240 kilometers southwest of Vancouver Island and Bowie Seamount 180 kilometers west of Queen Charlotte Islands.

Attention is only now being paid to the high seas, that is, marine areas beyond national jurisdiction, beyond the EEZ. It is only common sense to recognize that the values that deserve protection within a nation's EEZ can be the same values that occur on the high-seas side of that invisible boundary of 200 nautical miles. Ocean currents, except for biota fixed to the seabed, all the myriad life-forms in the water column, on the surface, and in the air overhead are in motion. Some migratory species travel thousands of miles every year, but they are not political animals, stopping at political boundaries.

All the high seas need not be protected, only those special areas that are or could be under threat or that contain superlative natural features. Certain fish stocks, for example, are in desperate need of protection of the critical habitats directly related to the welfare and survival of the species. These could include spawning areas, nurseries, and safe places for juveniles. These would be no-take zones, where fishing is not allowed and the habitat is protected from despoilment. Some coastal states have established such no-take zones. Their laws and regulations should be rigorously enforced. Similar systems should be established on the high seas where fishing pressures are extreme in order to ensure the continuation of the stock, and thereby provide for the continuation of the industry.

The Marine Section of the World Conservation Union (IUCN) World Commission on Protected Areas set up a special working group to advance the concept of protected areas in the high seas. I was appointed to lead the effort. The advisory committee recommended that the priority features for starting should be seamounts, hydrothermal vents, and black smokers. The idea is to identify some specific sites

that would merit careful scientific study to document the natural values and to identify the threats to those sites. They were selected because of the extreme pressure of fishing on seamounts, which are extraordinarily rich in species, and because of the potential for exploitation of the mineral and biological resources of the vents.

Wilderness

Wilderness has a role in the marine environment. Definitions of wilderness on land usually rely on the absence of evidence of human intrusion, primarily roads. In the three-dimensional marine environment, wilderness could be defined as marine space without the remains of human activity. If large-scale industrial use begins, and if destructive fishing practices continue, the time will come when there will be little ocean space or biodiversity that is not suffering from human impact. Designating significant areas as wilderness follows the precautionary principle. Yes, there is not only room for marine wilderness—there is need for it. Wilderness serves as a control by which the condition of other similar features that are being utilized can be measured. It provides excellent undisturbed areas for benign research.

While recreation on the high seas must consist of sailing, some adventurous people are now paying large sums (U.S. \$32,500 each) to be taken by submersible to view the remains of the Titanic. During the 4th World Wilderness Congress (WWC), held in Colorado, USA, in 1987, a five-day seminar was held entitled Ocean Wilderness. Discussion among participants from many countries was sponsored by the wilderness congress organizers, the IUCN, and the National Oceanic and Atmospheric Administration (NOAA, a U.S. government agency responsible for marine programs). The 4th WWC resolved that more should be done in coastal waters to develop systems of protected areas in marine environments within the waters of coastal states. It said that wilderness is an appropriate designation for certain pristine areas. These concepts must be extended to the high seas.

A number of difficulties inhibit the development of an international system of MPAs. First of all, governments and people lack appreciation and understanding that the oceans are extremely valuable, heavily influence weather, and are subject to present and future threats. Secondly, no international body exists that has clear authority to undertake the task. While there are a number of existing agencies, such as the International Maritime Organization, UN Economic, Social, and Cultural Organization's Biosphere Reserves program, UN Environment Program's Regional Seas, and a number of agencies established by treaties such as the United Nation's Convention on the Law of the Sea and the Convention on Biological Diversity, none of them has been analyzed by international lawyers to determine if they could assume the authority required to set up such a program. Thirdly, there is a critical need for an extensive and coordinated research program on all aspects of the marine environment.

We must hear from the scientists. So far, only exciting glimpses of the wealth of marine biota in the mid-waters and on the seabed have been photographed. A relative handful of scientists venture down to the depths in the new technological wonders of submersibles. Tethered robots also can extend even deeper, taking photographs and gathering specimens. Nations must cooperate in marine research, preferably under the coordination of an international agency. We have known about chemosynthetic life at the hydrothermal vents for only twenty years. What wonders remain to be discovered?

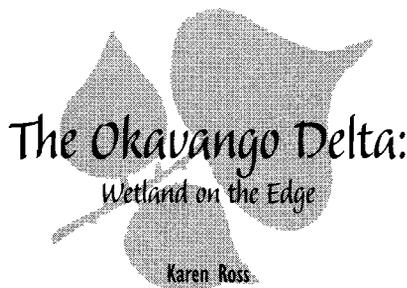
Management

Assuming that an appropriate international agency can be identified or established, its duties would include coordinating research programs so that the complexities and functions of the marine world can be

better understood. We need an inventory of what is there. Management regimes should be set up. IUCN's World Commission on Protected Areas has already established a system of six categories of protection. Originally developed for terrestrial areas, they now apply to marine areas as well. The categories range from areas warranting total protection to areas being managed for sustainable use. Category I includes wilderness. Characteristics of the natural features, size, location, and vulnerability to threats would guide the degree of protection afforded to candidate areas.

Monitoring and Enforcement

While monitoring activities in and under the high seas may seem like a formidable task, technological developments would facilitate it, such as satellite observation. The system of extremely sensitive listening devices installed on the seabed by the U.S. Navy, but now discontinued, could be utilized. Enforcement could be a project for the world's navies. Already the navies of France and Australia are enforcing some fisheries regulations in the southern ocean, while the U.S. Coast Guard is doing the same in the North Pacific.



The Okavango Delta:

Wetland on the Edge

Karen Ross

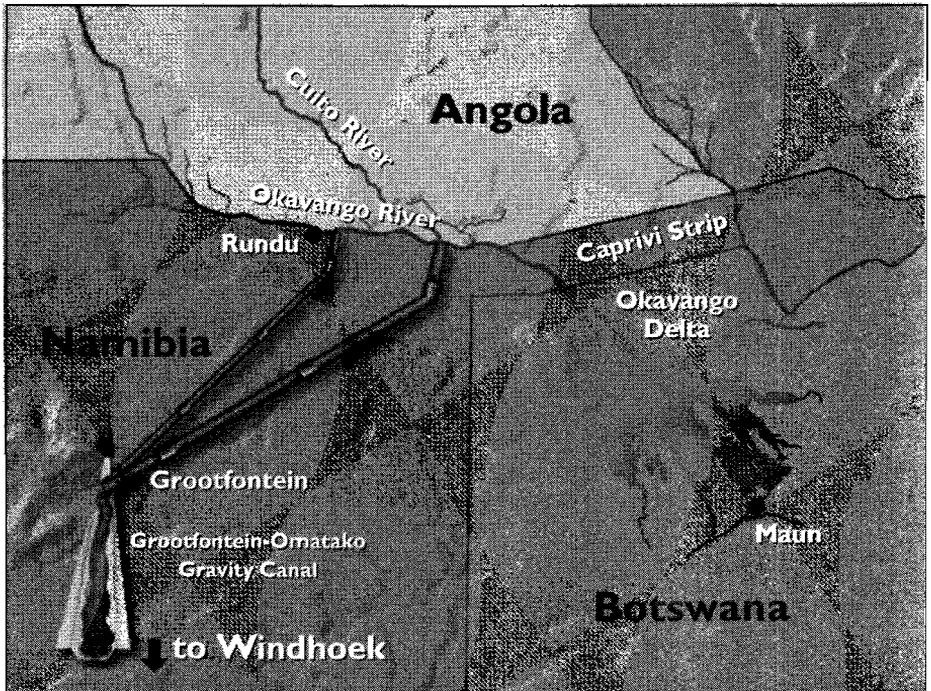
The impenetrable thirst land of the Kalahari Desert once protected the Okavango Delta. The delta only became known to the outside world in the mid-1800s when explorers such as Livingstone and Oswald finally, at the cost of many lives, were able to cross this previously inaccessible desert. There they found an extraordinary African wetland, an oasis, which supported an abundance of plant and animal life. Today, the delta can be reached by daily flights into Maun, while the first tar road to this frontier town was completed in 1993. This sudden exposure has enabled many people to reach this area. Such exposure has catapulted the Okavango Delta to world fame, but also to the threats that assail many of the world's great wilderness areas today. Over the past decade, threats to this fragile wetland have included bunding and water withdrawals, extensive pesticide application to control the tsetse fly, cattle encroachment, and habitat fragmentation by fences, overhunting, and salvinia weed invasion.

But since 1996 two of these threats, water withdrawal and fence construction, have accelerated to the point where they could compromise the future viability of this remarkable wilderness. Despite this, the Okavango Delta remains one of the most lovely and enigmatic wilderness wetlands remaining in the world today.

Background

The Okavango River rises in the highlands of southern Angola, where headwaters combine to form two major rivers, the Cuito and the Cubango. These two rivers meet along the Namibian border to form the Okavango River. The river flows briefly through Namibia's Caprivi Strip before entering northern Botswana. Here the river slows and spreads over Kalahari sands to create the classic fan-shape of the Okavango Delta, confined by a series of fault lines that are southerly extensions of the Great Rift Valley. Seen from above, the delta resembles an outstretched hand, the narrow "wrist," known as the Panhandle, is probably the most vulnerable part of the delta, as it still has no legal protection. One hundred and sixty five kilometers to the south, the labyrinth of waterways, islands, and sandveldt tongues end abruptly at a fault line that collects and redirects the remaining waters, as little as 2 percent of the inflow and sometimes none, toward the desolate edges of a the world's largest salt pans, the Makgadikgadi.

Measuring some 16,000 square kilometers, the Okavango Delta comprises a constantly changing array of landscapes. The tapestry of habitats in the delta is so subtly interwoven that only from the air is the pattern clear. In its upper reaches, permanent water supports dense reed beds and papyrus swamps, interspersed with small islands of date palms, fig trees, and mahogany. Life here is primarily aquatic, supporting nearly 100 species of fish, which are prey to numerous bird species including the rare Pels fishing owl, and aquatic animals such as crocodiles, hippos, and the elusive Sitatunga antelope. Farther south the



Namibia Water Projects Proposed Pipelines.

islands become larger, and their forested fringes are important to smaller mammals including civets, genets, leopards, and five species of mongooses.

Each year a floodtide of fresh rainwater sweeps through the system. The annual flooding of the delta is a unique feature, where annual rains in Angola travel slowly through the river basin, taking some five to six months to reach its lower fringes and thus arriving in the depth of the dry season. Most creatures time their life cycle in synchrony with this annual event. The lower delta is characterized by extensive floodplain grasslands, which support populations of Africa's larger mammals including elephants, buffalo, giraffes, and zebras, and over a dozen species of antelopes. These in turn support predators such as the endangered African wild dog, cheetahs, lions, leopards, spotted hyenas, and the smaller cats such as serval, caracal, and the African wild cat.

The historical inaccessibility of the Okavango, the former presence of the tsetse fly, which kept out people and their livestock, and a sparse human population have in combination helped this unique wetland to retain its wildlife. This resource is proving to be a great asset to Botswana. Always important to local hunter-gatherers, it is now the base of a growing tourism industry—the number-two foreign exchange earner in the country after diamonds. But this wildlife resource is totally dependent on water from the Okavango River and on the ability to move for forage and water unhindered. In the past three years, two major developments in the region have threatened the integrity of the Okavango. These are the very real threat of upstream water withdrawals from Namibia to feed the capital Windhoek with water via pipeline,



Okavango at Risk—Grootfontein—Omatako canal will take Okavango water to Windhoek. PHOTO BY H. CASTRO/CI.

as well as the construction of hundreds of kilometers of veterinary fences in Botswana, built to control cattle disease. The fences were constructed through and around the ecosystem, causing habitat fragmentation and wildlife losses. As described below, Conservation International and its field office in Maun mobilized immediately to address these threats.

Perhaps spurred by the threats from Namibia, Botswana became a signatory to Ramsar, the world's oldest environmental treaty for wetlands. Thus in 1997 the Okavango became the world's largest, and arguably one of the most important, Ramsar Wetland Sites of International Importance.

Critical Threats to the Okavango Delta: Upstream Water Abstraction

The Okavango Delta is almost entirely dependent on the inflow of the Okavango River, and its ecological function is closely linked to the annual floods. Conservationists have for some time been concerned about an aspect of Namibia's Master Water Plan, which includes the construction of a 300-kilometer pipeline to deliver Okavango waters to an open canal, which was built to carry water to a series of dams to feed the capital Windhoek. Its construction was scheduled for 2003. Although the original off-take was estimated at 20 million cubic meters, roughly 5 percent of the high-season flow of the Okavango River, there are several concerns. Most relevant is that Windhoek's water demand is expected to rise to 60 million cubic meters over the next ten years, and that level of off-take would definitely impact the delta. Another concern is that the water treaty between Angola, Namibia, and Botswana, which was pioneered in 1994, has yet to be concluded. The Okavango River is a wild river, one of only twenty such untampered

major river systems left in the world today. Such a significant pipeline is a major development, which would preempt the OKACOM treaty.

Unfortunately, in 1996 Namibia was in the grips of a prolonged drought. The government announced emergency plans to build the pipeline immediately. A Conservation International (CI) delegation traveled to Windhoek to their first scoping meeting, where the plan was discussed and where it became clear that no Environmental Impact Assessment (EIA) was planned for its possible impact on the delta. In response CI and the Kalahari Conservation Society founded a consortium of concerned Botswana-based organizations, called the Okavango Liaison Group. Its first action was to call for an EIA of the planned pipeline. The government of Botswana carried this message forward, and Namibia agreed to undertake such a study. At the same time these plans raised a huge international outcry. CI's international communications department produced a ten-minute video news release that was aired on public TV on the world's major TV stations, and the story was covered by CNN. Although this raised the issue to the attention of the world, what reversed the crisis was good rains in late 1996, which filled Namibia's dams and averted the emergency.

With plans for the pipeline put on hold for the moment, CI has worked with Namibian hydrogeologists and International Rivers Network to produce a report on possible alternatives that describe means to provide Namibia's water needs without resorting to piping water out of the Okavango River. The report shows that Namibia has sufficient groundwater to satisfy her immediate short-term needs, without needing to use the Okavango waters. A long-term option is to desalinize their seawater. Technology exists to desalinize water using wave power, if the correct tidal movement is available. The Atlantic coastline of Namibia is one of the few places on earth where this is possible—it has been calculated by Haggermann Alternative Power Technology Engineers that only a 15-kilometer length of buoys stretched along the coast would produce the equivalent amount of freshwater as would be taken from the Okavango pipeline in the first instance.

A major concern of the proposed pipeline, if it is built immediately, is that it preempts the proper deliberations, research, and consensus of OKACOM, the trinational water agreement between Angola, Namibia, and Botswana called the Okavango River Basin Commission. A significant Global Environmental Facility (GEF) grant has been awarded to conduct the necessary work to undertake research and stakeholder consultation, which is needed to reach consensus on the fair and equitable use of the Okavango's waters without detrimental impacts on the river basin ecosystem. The proper finalization of this important water treaty is vital before any major development works, such as the proposed Namibian pipeline, are implemented.

Fence Construction and Cattle Ranching

Botswana has a long and somewhat controversial history of fence construction. All built without EIAs, these fences criss-cross the vast areas of wilderness and impact the movement of wildlife seeking forage and water in this unpredictable semi-arid environment. Large numbers of animals have died, and habitat fragmentation and loss of range has resulted. The Central Kalahari's wildebeest migration was interrupted by the Kuke fence, resulting in the loss of 95 percent of the population. This example of loss of wilderness corridor access, followed by more recent developments in the Okavango region, is one of the great conservation tragedies of southern Africa.



Lung sickness cordon fence on the Okavango Delta, Botswana. PHOTO BY HAROLDO CASTRO.

Most of Botswana's fences were built to comply with strict European Union (EU, formerly EEC) beef import regulations, which stipulate that cattle must be free of foot-and-mouth disease, also believed to be carried by buffalo. Anxious to comply (Botswana receives 60 percent more than the world market price as an incentive), the government built hundreds of kilometers of fences to separate and quarantine the southern cattle herds from the cattle and wildlife in the north, where they have contact with buffalo. The infamous Kuke fence marks the northern extent from where cattle can be exported to the EU, but recent events indicate that this boundary is to be pushed farther north, into the region called Ngamiland, in which lies the Okavango Delta and its remaining herds of wildlife.

Another cattle disease recently broke out in northern Ngamiland, which resulted in dramatic and unprecedented actions, further threatening the integrity of the Okavango Delta and its priceless herds of wildlife. This crisis emerged during the latter part of 1995, when a cattle disease called Contagious Bovine Pleuro Pneumonia (CBPP), or "lung disease," broke out along the northern Botswana border. It was thought to come from disease-infected cattle that moved into Botswana from the previously open border along the Caprivi, an important wildlife access corridor. Because of the infectious nature of the disease, the government of Botswana acted quickly to stop its spread. They erected a series of three parallel fences, the Samochima, Ikoga, and Setata fences, which stretch from the western edge of the Okavango Delta to the Namibia border (see map 2). These fences failed to stop the spread of CBPP because farmers who knew their infected cattle would be exterminated rustled them around the quarantine fences. As the disease spread to the last barrier, the Kuke fence, which protects the valuable export cattle to the south, a dramatic decision was made. It was decreed that the entire 360,000 head of Ngamiland cattle was to be exterminated. This exercise was carried out swiftly, with huge protests from the local population, who even though promised compensation were traumatized to see their precious cattle herds, a source of wealth,

status, milk, meat, and drought power, killed. With police and military assistance in maintaining quarantine measures along fences, the outbreak was finally brought under control in early May 1997.

As a final precaution, lest more cattle move in from Namibia, the entire Namibian Caprivi border was sealed by a double electric fence now called the Caprivi Border fence. A large section of the area to the east of the Panhandle has become isolated from the outlying greater Okavango ecosystem by the extension of the Northern Buffalo Fence to the Caprivi border. Conservationists, in particular Conservation International and the World Wildlife Fund/Life project in Namibia (Chris Weaver), protested at this dramatic sealing of an important wildlife corridor before its construction. But such was the fear of the further infections that the government of Botswana continued with its planned sealing of the border, as cattle interests apparently superseded the concerns of wildlife impacts.

In response to the dramatic proliferation of fences in the Okavango region, CI's Okavango Program was instrumental in the formation of a multisectoral committee called the Ad Hoc Committee on Fences (AHCOF). Composed of members of Botswana's Department of Animal Health, Department of Wildlife, National Conservation Strategy Agency, CI, and the Kalahari Conservation Society, this committee met frequently to discuss the issue of fences impacting wildlife and possible mitigation measures. As a result of these deliberations of AHCOF, the Botswana government agreed to remove a critical 40-kilometer stretch of the Caprivi Border Fence where it reaches the Kwando River, thus partially opening up an important wildlife corridor.

In summary, the major current threats to the Okavango include upstream water abstraction, and the loss of important wilderness range and migration corridors through a combination of cattle encroachment, cordon fences, and human encroachment in general.

The Way Forward

Taken together the two threats reviewed in this paper have serious consequences for the sustainable utilization of the Okavango Delta. It is perhaps ironic that such a fragile system should now face national and regional threats. Fences themselves spell danger to wildlife numbers and movement in the Okavango system. Coupled with this, the threat of upstream water extraction could deplete the unique wetland oasis, causing it to resemble the harsh climate it is situated in—the Kalahari Desert.

Government policy on the whole has favored cattle interests over wildlife ones. This bias is most clearly demonstrated by several instances in which cattle-owning bureaucrats or local elites were able to choose fence alignments as ways in which to increase the range available for grazing. Botswana's experience with veterinary fences reflects its cattle bias. However, this concluding section also draws attention to recent initiatives undertaken by the government of Botswana, with help from nongovernmental organizations (NGOs), to change its fencing policies. The formation of the AHCOF, and the process now underway to undertake retrospective EIAs on all cordon fences, demonstrates that wildlife interests have made some important gains. Changes in the political working atmosphere of the civil service have made government more willing to integrate wildlife concerns into its decision making. These changes have come about partly due to international interest in Botswana's wildlife by lobbying from environmental NGOs such as CI, and by enhanced collaboration between government departments such as the Department of Wildlife and Department of Animal Health.

While international attention on the negative impacts of veterinary cordon fences has drawn attention to the issue, government is still adamant to erect more fences to help "commercialize" cattle ranching. If

people were to benefit more directly from their wildlife resources, for instance through Community Based Natural Resources Management (CBNRM) or ecotourism, they would better realize the benefit of these resources and become more involved in conservation. Despite various public relations efforts the local constituency for wildlife conservation is still weak. What is essential now is for the government to sanction an independent review to determine which one of the two alternative land use options is more viable in terms of improving the quality of life for Botswana in community areas, and in valuable ecosystems such as the Okavango Delta. Wildlife and natural-resource-related income-generating activities, if done sustainably, will allow for a more equitable distribution of wealth, while cattle ranching activities allow for the rich to get richer and the poor to get poorer. The signs are that such activities, often spearheaded by environmental NGOs and community leaders, are making progress. But firm action needs to be taken before important wildlife corridors are forever blocked, and land use changes spell trouble for wildlife and nature as a whole. This will be assisted through the establishment of a Transboundary Conservation Area (TBCA) or Peace Park.

Actions:

- Open up essential wildlife corridors.
- Remove and realign key fences.
- Emphasize land use plans on CBNRM and tourism rather than cattle ranching
- Establish more TBCAs
- Work with OKACOM to develop alternatives for Namibia and the Okavango Liaison Group (OLG).
- Increase protection by increasing the number and size of protected areas, with community participation.
- Join protected areas with corridors.

Water Extraction

The international character of the Okavango River Basin and the competing demands for water resources presents a situation ripe for conflict, yet these very same geographic traits present opportunities for regional cooperation in the management of a scarce resource. Where water spreads out over otherwise dryland it becomes of interest to all people and an almost irresistible attraction to engineers and developers. All of Africa's great swamps, from the Nile Sudd to the Okavango, have received attention from those who want to do something different with the land or water. Wetlands are usually highly productive ecosystems. In Angola, Botswana, and Namibia water is a scarce and precious resource. Its presence determines how well people survive; its absence leaves large areas uninhabitable. Potential conflict lies in Namibia's insistence that the "small" quantity of water they aim to extract will not affect the Okavango Delta downstream, and that it is their moral duty to their people and international law right to extract its waters. Conversely, Botswana has shown commitment to equitable water use by canceling its large water extraction project (SOIWPD) due to community protest in 1991, and also by declaring the delta a Ramsar Wetland Site of International Importance in 1997.

A possible long-term resolution to the potential conflict over the Okavango's waters may lie in the introduction of OKACOM. The most effective means of minimizing international conflicts is to establish positive attitudes between groups before conflict has a chance to begin. In addition to OKACOM's technical and scientific input, it is crucial that ways are found whereby this political conflict situation can be turned into an example of international cooperation. Attention must be shifted from national gain toward



Okavango's water brings life to the Kalahari Desert in Botswana. PHOTO BY H. CASTRO/CI.

universal sustainable management of a shared resource. One realistic way of achieving this aim lies in creative collaboration between OKACOM and concerned NGOs.

Underscoring the importance of water treaties is the fact that nearly 300 international treaties have so far been adopted for the purpose of avoiding conflicts over water. But in an analysis of these treaties, most were found to have significant drawbacks. The most common failings are: tendency to be "top down," little public participation, and a tendency to reflect a technical rather than environmental bias. Promising signs for the Okavango have emerged with the formation of the OLG. The OLG is a growing regional network of NGOs of which CI is a member. This group, in conjunction with various stakeholders, proposes to implement a project titled *Every River Has Its People: Promoting Comanagement of the Okavango River Basin*. Comanagement involves the shared management of natural resources by those who have the official obligation to do so, i.e., government, and those who live with and use the resources, such as communities and the private sector. The goals of the proposed activities are twofold: (1) increase the capacity of the region's institutions and stakeholders to participate in comanagement of the Okavango; and (2) create a protocol by which comanagers of the resource may participate in sustainable management of the Okavango River Basin.

There are four levels of management-related activities in the Okavango River Basin. On the highest regional level, OKACOM is conducting the basinwide management planning process; on the next level, governments are engaged in national level planning activities (e.g., Namibia is conducting a water sector analysis and Botswana has launched planning efforts for Ramsar and a National Wetlands Policy); on the provincial level, regional institutions are undertaking water projects (e.g., Ngamiland District Council is constructing water supply pipelines along the Okavango Delta); and on the local level, riparian towns and villages are busy securing water for residents' daily use. With these multiple layers of management, there is

one interwoven element—the people who live in the basin—and one theme that could tie the levels of effort together—participation.

Another solution to ensure the sustainable future utilization of shared water of the Okavango is the establishment of a Regional Environmental Assessment Policy. Environmental Assessment (EA) is a useful planning tool, and since the threats to the Okavango are development incentives EA would prove a viable tool to assess these developments and ensure that they are sustainable. Unfortunately though, Angola and Botswana have not made significant progress in adopting EA as a strategic planning tool, and thus southern Africa has not made a collective effort to apply EA at the regional level. Only Namibian consultants carried out the Rundu Pipeline Environmental Impact Assessment, and this was a cause for contention in Angola and Botswana. In order to avoid this bias, consultation and cooperation on development initiatives must be planned collectively and in a transparent manner.

Another tool for the sustainability of the basin system is the implementation of a Water Demand Management Strategy by the riparian countries. Demand management is aimed at optimizing the use of available water rather than developing new or extended supplies. It is clear that in a water-scarce developing country such as Namibia, demand management offers one of the most economical solutions to extending the equitable provision of water, while at the same time contributing to sustainable development. Using techniques to analyze the interlinked water resource systems, it has been shown that some of the proposed future augmentation schemes can be delayed by many years if the growth in water demand can be reduced through water conservation measures. The financial implications of delaying the future augmentation schemes are enormous and it is clear that water demand management is a key issue requiring serious attention in a water-scarce country.

How important is it that the Okavango Delta should survive? There appears to be no argument that the delta is a valuable and unique resource to Botswana. Furthermore, there would be many who argue that it is also a world treasure, and thus the world at large should be concerned about and involved in its protection.

A combination of the scenarios described in this paper will contribute to the sustainable management of the Okavango River Basin and in so doing it is hoped that the future of this unique system will be pulled back from the edge.



Living Lakes is an international lake partnership created and coordinated by the Global Nature Fund and the German Environmental Aid Association. The following lakes from four continents were the initial members of the lake network: Mono Lake (United States), Lake Constance (Germany, Switzerland, Austria), St. Lucia Lake (South Africa), and Lake Biwa (Japan). More recently Spain's La Nava Lake wetlands and Greece's Nestos Lakes were admitted into the partnership. All lake regions are vulnerable to environmental pollution. In some cases, pollution levels can be reduced considerably. Most lake areas are also rich in culture and enjoy great popularity among tourists. They also provide gathering places for migratory birds.

An aim of government organizations and nongovernmental organizations (NGOs) in these lake areas is to promote sustainable development objectives and to harmonize human activities and nature. Partners will meet annually, will exchange their experiences via the Internet, and will help each other as necessary. Additional lakes will be integrated into the project until the year 2000.

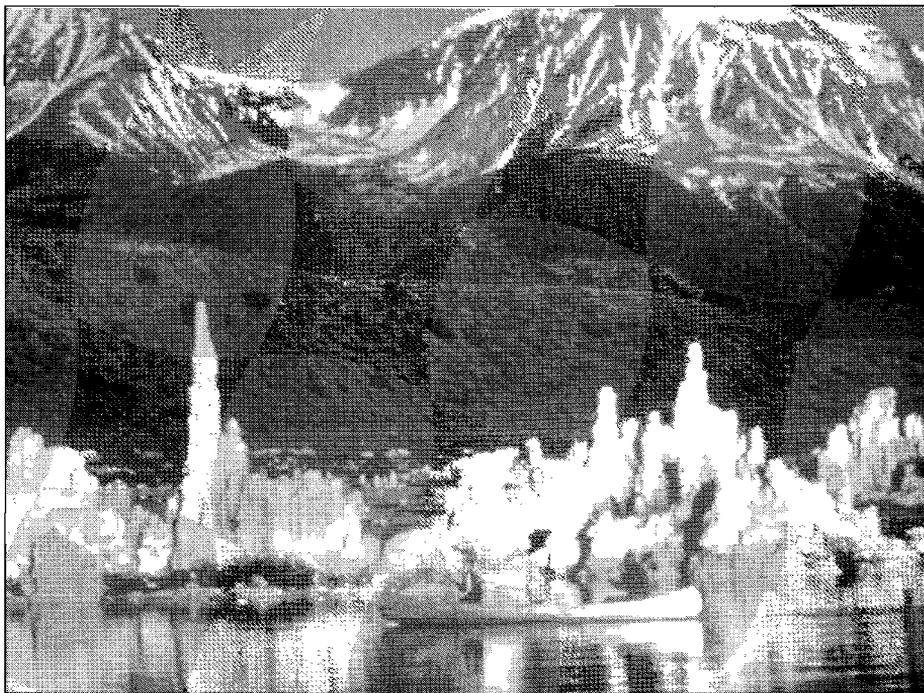
Although the lake network has been created recently, it already has received great support. Whilst the global partner is Unilever, it is also financially supported by Daimler-Benz, Deutsche Lufthansa, Compaq Computer, and the Deutsche Bundesstiftung Umwelt (German Federal Foundation for the Environment). Finally, Living Lakes is an official project of World Exhibition EXPO 2000.

Mono Lake—A Lake in the Desert— United States

Mono Lake in the United States has a surface area of about 180 square kilometers (70 square miles) and reaches a maximum depth of about 45 meters (145 feet). It is situated in a 39-kilometer-wide (24-mile-wide) desert basin, about 1,980 meters (6,500 feet) high on the eastern side of the Sierra Nevada. The history of Mono Lake begins more than 760,000 years ago.

As Mono Lake is a terminal lake, its water is twice as salty as seawater, contains large amounts of minerals, and is eighty times harder than seawater. The process of aging was dramatically accelerated by the demand for water by Los Angeles, situated 485 kilometers (300 miles) south of Mono Lake. In 1941 four of the five rivers flowing into the lake were diverted to Los Angeles with disastrous consequences for the lake. Its salinity doubled, and its surface was reduced to less than a third of its original size.

This threatened the habitat for more than 50,000 California gulls and flocks of other migratory shorebirds. Among the threatened birds were several thousand Wilson's phalaropes (*Phalaropus tricolor*). Every year more than a million grebes and phalaropes migrate south from breeding areas in Canada and Alaska and rest at Mono Lake. Twenty years ago conservationists predicted the continued decline of Mono Lake. In 1978 conservationists founded the Mono Lake Committee with the aim of saving the lake by reducing excessive water consumption in Los Angeles.



Mono Lake, USA. PHOTO BY ULF DÖRNER

Twenty years of negotiations, court challenges, and water conservation projects in Los Angeles supported by the Mono Lake Committee and other conservation groups led to a compromise. The state of California decided in 1994 that water users should divert only a part of the water flowing in the rivers. Since 1994, the lake level has risen 3 meters (9 feet). More than 100 different species of migratory birds use the lake as a “stepping stone” in their long flights. These include 2 million shorebirds, which feed on the huge number of brine shrimps and alkali flies living in Mono Lake. The project partner of Living Lakes is the Mono Lake Committee of Lee Vining.

Lake Constance—A Child of the Ice Age— Germany, Switzerland, and Austria

With a surface area of 570 square kilometers (220 square miles), Lake Constance is the second-largest freshwater lake in central Europe. During the last Ice Age the lake reached its current maximum depth of 245 meters (800 feet). Compared to Mono Lake, this 15,000-year-old-lake is a young body of water. Bordering countries include Germany, Switzerland, and Austria. The area has been influenced by many different European cultures.

People settled in the Lake Constance region thousands of years ago. More than 2 million people live, work, and relax in the Lake Constance region. The 12,500-square-kilometer (4,825-square mile) watershed provides drinking water for more than 4.5 million people. Each year 50,000 boats use the lake, and 200,000 waterbirds rest or hibernate there. These include about 80,000 tufted ducks, 50,000 pochards, and 7,000 great crested grebes. Several regions around Lake Constance meet the European Union criteria for gathering places of migratory birds.

In the 1970s Lake Constance was threatened by phosphate loading from household detergents. Each year the lake experienced several explosive algal blooms followed by depletion of oxygen in lake waters. A transboundary campaign began and sewage treatment plants were built that greatly reduced phosphate discharges.

In 1990 Deutsche Umwelthilfe initiated cooperation among twenty conservation associations from Switzerland, Austria, and Germany. Their common target was to develop the Lake Constance area into a region of sustainable development. This project is substantially supported by Lever, Stiftung Naturschutzfonds of Baden-Württemberg, and the Deutsche Bundesstiftung Umwelt. The project, Sustainable Lake Constance, emerged from these initiatives and has become a “worldwide project” of the World Exhibition 2000 Hanover.

Project partner of Living Lakes is the International Lake Constance Foundation for Nature and Culture in Constance.

St. Lucia Lake—A Gathering Place for Migratory Birds—South Africa

St. Lucia Lake, a former arm of the Indian Ocean in South Africa, measures 65 kilometers (40 miles) in length and has a surface of about 350 square kilometers (135 square miles). Forested dunes up to 183 meters (600 feet) high separate the lake from the sea and feed St. Lucia Lake via creeks and groundwater. St. Lucia Lake lies amid the 2,180 square kilometers (842 square miles) of Greater St. Lucia Wetland Area, the oldest protected area in Africa. In its lakes, brackish water lagoons, swamps, and savannas live 530 different species of bird. Among them are many hundreds of thousands of migrant birds from Europe such as white storks, bee-eaters, orioles, and curlews.

The St. Lucia area was threatened by mining for titanium and other minerals. International pressure generated by local environmentalists succeeded in convincing the South African government to protect the lake. Instead of allowing open-pit mining, the government decided this area should become a World Heritage Site under UN Economic, Social, and Cultural Organizations. Open-pit mining can permanently be stopped only if the park administration and ecotourism are able to create more jobs than mining activities would provide.

The project partner of Living Lakes is the Wilderness Foundation in Durban-Natal.

Lake Biwa—Ancient Natural and Cultural Landscape—Japan

Lake Biwa, which has a surface area of 671 square kilometers (259 square miles), is larger than Lake Constance. With an age of 1 million years, Lake Biwa is the Methuselah among our living lakes. It is located near Kyoto in the south of the largest Japanese island, Honshu, and is an important link between settlements on the lake.

Water from the lake is used for drinking, irrigation, and power generation. Lake Biwa is fed by 400 creeks and rivers. In recent years, more than 24 million people visited the lake area annually—far too many visitors for its 600 different species of animals and plants. A special feature of this area is the occurrence of the freshwater pearl oyster.

In the 1960s and 1970s water quality decreased dramatically. Problems with the drinking water supply and the decline of many threatened species alarmed the Shiga Prefecture. In 1984 the prefecture started a



Lake Biwa, Japan. PHOTO COURTESY OF THE GLOBAL NATURE FUND.



Nestos river delta, Greece. PHOTO BY J. RESCH.



La Nava, Spain. PHOTO BY U. GATTENLÖWNER.

program to clean the water. In the early 1980s close cooperation with the Limnological Institute in Constance was initiated. In 1984 the first World Sea Conference took place at Lake Biwa. In 1989 another international symposium was organized under the motto “Ecology for Tomorrow.”

Due to the dense population in the area, the problems at Lake Biwa are particularly serious compared to the other lakes. Many conservationists inside and outside the government are working together for sustainable development and for guaranteeing survival for people, plants, and animals around the lake.

The project partner of Living Lakes is the Lake Biwa Research Institute in Shiga.

Seven Lakes—A Valuable Part of Nestos River Delta—Greece

The Seven Lakes are part of the Nestos Delta, which has been classified as one of the ten most important European wetlands. Nonetheless, the area has yet to receive any national protection. The wetland's vegetation is rich, the surrounding hills are covered with flowers, and the scenery is a mosaic of dry meadows, brush, and fields.

In the area of the Seven Lakes, eighty-five species of birds breed, among them some rare species. In addition, there are seventeen different species of fish, thirty-one species of dragonfly, and twenty-seven species of orchid. Among the resting birds are worldwide-threatened species like dalmatian pelican, pygmy cormorant, and white-tailed eagle.

Intensive agriculture is one of the greatest threats to the Seven Lakes because it overloads lake waters with nutrients and pollutants. Farmers pump off large quantities of water to irrigate their fields,

reducing the water level in the lakes. Plus, smaller wetlands are drained illegally. This type of development must be stopped.

The project partner, the Society for Protection of Nature and Ecodevelopment, has developed a concept for saving the area, based on years of research.

Lake La Nava— Revival of an Old Lake—Spain

In the past, Lake La Nava's area varied between 32 and 49 square kilometers (12.5 and 19 square miles.) The lake is located in northwest Spain on the Tierra de Campos Plateau near Palencia. Two rivers fed the lake—the Valdejinata and the Retortillo. The lake had a maximum depth of 9 feet.

In summer, evaporation of lake waters exposed large grazing areas used by sheep, cattle, mules, and horses. Thus, people used the riches of nature without destroying them. Politicians had a dream of a blooming landscape producing a rich harvest. In the 1940s the construction of fifteen large and many small canals and ditches nearly drained Lake Nava. The expected harvest did not arrive.

In 1990 the Fondo Patrimonio Natural Europeo brought Lake La Nava back to life. Now it covers about 304 hectares (750 acres). As expected, Lake La Nava has become an internationally important area for indigenous plants and animals and a gathering place for migrating birds.

The project partner of Lake La Nava is the Fundacion Global Natura España, supported by Lever Spain.

Global Nature Fund

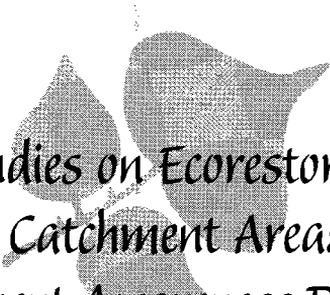
In April 1998 the Global Nature Fund (GNF) was founded. A principal task of the foundation is to promote sustainable development objectives at the international level. Living Lakes is our first project. From the very beginning, GNF has received great support from non-governmental organizations, nature protection associations, international businesses, and foundations. Our major objectives are to provide financial support for international conservation programs and to exchange information among conservationists worldwide.

SECTION VI



Corporate
Environmental
Responsibility:

Case Studies with
Questions and Answers



Case Studies on Eco restoration of Hydel Catchment Areas and Environment Awareness Programs Through Corporate Initiatives

Erach Bharucha

The pattern of environment-related activities that most industries are usually involved with include controlling pollution, dealing with socioenvironmental issues related to health care, and greening their premises. Innovative ventures that go beyond these issues, into environmental management or environmental awareness action programs, have been limited in number and scope. Those that have been initiated are rarely publicized.

The Bharati Vidyapeeth Institute of Environment Education and Research (BVIEER) has been actively involving industrial houses in its environmental activities, both as fund-raisers and as active partners. These innovative approaches to managing environments and generating awareness help to produce pro-environmental actions in local communities. These initiatives have been focused not only within the industry precincts but have involved neighborhood communities.

Background

The BVIEER was established in 1994. The institute's programs include a formal environmental science course at the master of science level and a diploma in environment education for in-service teachers. The nonformal educational activities include Teacher Training Workshops (TTWs), in which over 350 teachers have been trained, and School Environmental Education Programs (SEEP) in forty schools in and around Pune. The institute has initiated conservation research on the Western Ghat forests and Deccan Plateau grasslands. These independent spheres of activities have been integrated with each other to augment the effectiveness of all three components. Graduate students are encouraged to participate in environment education school activities. Both school and graduate students have visited sacred groves in the Western Ghats and the Rehekuri Blackbuck Sanctuary, which are important research sites. Schoolteachers actively participate in all the environment education programs along with our environment educators.

Nonformal Environmental Education Outreach Initiative

Activities include:

- Training workshops in which 350 teachers and nongovernmental organizations (NGOs) have been trained in varied aspects of environment education.

- SEEPs in forty schools that involve more than 4,000 students in locale specific action programs. Initiating self-supporting programs through teachers who are provided with training and material on environment education.
- Publication of locale specific environmental education materials such as a unique *Teachers Handbook on Environment Education* linked to the Maharashtra syllabus. The handbook is locale specific and links environmental concepts to the specific textbook lessons in several subjects such as general science, geography, social studies, and language for Standard V to IX.
- Developing nature interpretation centers to enhance environmental awareness of local issues at school and college levels as well as for the general public.

Research

The research is focused on need-based issues with a desire to bring about proconservation action. A major focus is on field ecology and biodiversity conservation. Thrust areas have included the bio-rich Ecologically Sensitive Areas of the Western Ghats and sacred groves in the Mawal and Mulshi Talukas. The grasslands of the Deccan Plateau have Protected Areas in which there are serious conflict issues due to crop damage by blackbuck and predation of sheep by wolves. These are key concerns at the regional level.

- A major project undertaken over the last five years has resulted in an ecorestoration and ecodevelopment strategy for the catchment areas of Tata Electrical Companies Hydel projects.
- Studies have been undertaken on the botanical, sociological, and religious aspects of the sacred groves of Mawal and Mulshi Talukas.
- The findings of these projects have been used in locale specific environmental education programs for school students and to generate public awareness at the local level.

Corporate linkages

BVIEER's activities have been funded primarily through corporate initiatives such as Tata Electric Companies' (TEC) ecological research for ecorestoration of the Western Ghat Hydel Catchment areas and the Confederation of Indian Industries support for our School Environment Education Program. The TEC also supports a School Environment Education Program in schools in Lonavla and is developing a major nature interpretation center.

The TEC's Ecorestoration Program

Fragments of the forests of the hill ranges of the Western Ghats have been preserved, even though most adjacent areas have been intensively used to promote agriculture and more recently industry and urbanization. As human-made landscapes have expanded and saturated the region, the less intensively used wilderness areas have become the focus of expanding development programs. This forms a major threat to forest biodiversity in this globally acknowledged "hotspot."

The valleys of the Western Ghats are also highly suitable to develop Hydel power generation projects. The catchment management of these projects, however, has rarely focused attention on preserving natural vegetation. This happens in spite of the realization that deforestation leads to erosion of the catchment and subsequent siltation of the lakes.

The TEC maintains four Hydel lakes in the biorich hotspots in the Western Ghats in Mulshi and Mawal Talukas. Their catchments have been degraded due to increasing biotic pressures. The TEC has implemented a standard afforestation model over a period of eight to ten years, which though fairly successful, has no relevance either to ecological or sociological needs of the region.

In 1991 TEC established an advisory committee to redefine the needs of their afforestation strategy. This led to a research program to document the biodiversity values of their catchment areas and to develop a new ecosensitive program. The research results provided inputs into the extent and spatial distribution of forest degradation and a quantification of biodiversity in the less disturbed, moderately disturbed, and severely disturbed landscape elements on a comparable basis.

Summary of the Research Results

A major difference in the land use and topography of the four catchments shows that while Walwhan and Shirwata lakes have no “Malki” farmlands in the catchment, those of Andhra and Mulshi have large “paddies” within them. Thus, in the former, the pressures are from outside the catchments, while in the latter, the pressure changes are from within their catchments. A major change in land use due to the sale of farmland to urban speculators in Andhra and Mulshi has led to a rapid increase in the pressure on residual islands of forest. The farmers who are landless continue to raise cattle. However, as they have no crop residue to feed their livestock, the animals become increasingly dependent on the forest “commons” for grazing. This has serious impacts on the reserved forests.

The vegetation analysis shows that the catchment of Walwhan has 25.1 percent natural forest, 22.5 percent degraded forest, 40.2 percent scrubland, 10.8 percent shoreline vegetation, and 13 percent plantation. The spatial distribution of the vegetation shows that larger fragments of natural forest are in the more remotely situated and relatively inaccessible peninsular region in the northern part of the catchment. These consist of fragments of less disturbed vegetation separated by a matrix of degraded forest or scrubland. The largest continuous stretches of scrubland are to the west and are due to biotic pressures of the urban area of Lonavla. The seven village settlements to the east led to a relatively lower pressure and have resulted in smaller areas of scrubland. Lopping pressures are higher in natural forest and degraded forest on the fewer residual trees of the scrubland as the effort to collect biomass in scrubland is relatively greater. The pressure of grazing is highest in scrubland as it has adequate grass cover and is progressively lower in degraded and natural forest. The degradation changes continue to spread into less degraded areas.

The density of trees in natural forest is 154.99 trees per hectare, in degraded forest it is 127.58 per hectare, in scrubland it is 48.07 per hectare, in plantation it is 433.76 per hectare. The high density in plantations is mainly of *Acacia auriculiformis*.

The average height in low-lying natural forest is 4.73 meters, in natural forest at higher reaches it is 3.40 meters, in degraded forest the height averages 4.55 meters, and in scrubland it is only 2.26 meters. The average girth in natural forest is 0.73 meters, in degraded forest it is 0.62 meters, and scrubland it is 0.40 Mt.

The digitized aerial pictures show that the canopy cover in natural forest ranges between 53 percent and 85 percent in different areas. In degraded forest it ranges from 24 percent to 59 percent. In scrubland it is 7 to 18 percent.

Several plant species are found in natural forest and disappear as degradation advances—for example, terrestrial orchids such as *Habernaria grandiflora* and epiphytic orchids such as *Aerides* and dendrobiums. On the forest floor there are uncommon species such as srriga and a variety of mosses, ferns, and fungi

that are not found once the canopy is destroyed. However, rare species such as *dtoseta* are located in small patches in degraded areas.

The soil characteristics and depth showed gross variations with a much greater depth and balanced soil conditions in the natural forest as against degraded forest, with gross changes due to erosion in scrubland.

A checklist of vegetation based on flora by Fr. Santapau and B. Venkatraddi indicates that at the regional level there are 833 plant species. The study of the forest composition at Walwhan shows that out of 2,757 trees in the Walwhan sample, which was done using eight 15-meter belt circuits, there were sixty-four species of trees. An important finding is that only five species constitute more than 50 percent of the individuals. Similarly, of the thirty-nine shrub species, only two species account for 50 percent of the shrubs. (*Strobilanthus* has by far the greatest number, which makes it difficult to quantify). The most frequently encountered tree species of the catchment are *Syzigium*, *Bridelia retusa*, *Memecylon*, *Erythrina indica*, *Ficus racemosa*, *Terminalia crenulata*, *Randia dumetorium*, and *Mangifera indica*. The findings demonstrate that as forest degradation progresses through zonal changes of natural forest, degraded forest, and scrubland, the decrease in the number and species of the evergreen component of trees is greater than that of the deciduous component. Thus, the percentage of evergreen and deciduous trees is as follows: In natural forest it is nearly equal, with evergreens at 51 percent and deciduous trees at 49 percent. In degraded forest the evergreen component is reduced to 32 percent, and the deciduous component is 67 percent. This is a reflection of the lower regeneration of evergreen species due to the opening up of the canopy due to biotic pressure. The ratio further deteriorates when severe biotic pressure has led to the formation of scrubland, in which only 19 percent are evergreen trees, while 81 percent are deciduous trees. This demonstrates the extremely poor recruitment of evergreens once the canopy is severely depleted due to biotic pressures.

The checklist of birds in the Walwhan Catchment has ninety-eight species. The abundance and species richness of avifauna of the catchment during counts done over approximately 100 hours recorded birds of sixty-five species in 32.15 square meter quadrants. Of these, five species constitute 50 percent of the individuals. These five species include red whiskered bulbul, red vented bulbul, purple sunbird, tufous backed shrike, and small green barbet. Correlation with the patterns of vegetation show that in natural forest, 287 birds of forty-eight species were recorded, as against 166 birds of thirty-four species in degraded forest, only forty birds of nine species in scrubland, and fifty-one birds of nine species in the plantation during the same observation period. Birds that were recorded mainly in natural forest include large green barbet, small green barbet, white bellied drongo, common wood shrike, Tickell's blue flycatcher, paradise flycatcher, small sunbird, yellow throated sparrow, Quaker babbler, scimitar babbler, spotted babbler, red spurfowl, and Nilgiri wood pigeon. An important observation was that the scrubland in the Ghats is not colonized by the grassland bird species of the adjacent Deccan Plateau.

This shows that even at microfragmentation levels, there is a close relationship of the "intactness" of vegetation with avifaunal abundance as well as species richness. The conservation significance of the area is evident from the large number of specialist forest species of birds recorded in fragments of natural forest, and the presence of unusual birds such as the gray hypocolius.

The relationship of arthropod abundance and arthropod orders and species richness of the area has a close relationship with the vegetation zones. Though the insect community is dominated by localized high abundance areas due to colony formation in ants and bees, the abundance and species diversity shows that natural forest is richer and more abundant in insects than degraded forest, which is relatively richer than scrubland.

In the natural forest diptera (butterflies and moths), Hymenoptera (ants, bees, and wasps), and spiders are most frequent. There is a fairly high population of pill millipedes and scorpions, followed by crabs and stone flies. Long-legged centipedes are uncommon.

In the degraded forests butterflies, moths, ants, and spiders are the most abundant. Though millipedes are frequent, the pill millipedes are conspicuously absent. Scorpions also disappear, and only a few crabs were observed.

In the scrubland the dominant order is Hemiptera (bugs). The butterflies and moths are less abundant. The centipedes, millipedes, forest cockroaches, and cicadas are not found. Crabs are found in large numbers.

In the plantation, the dominant order changes to Hymenoptera, ants and wasps. Centipedes, millipedes, scorpions, bugs, and cicadas are not found.

The soil samples studied showed a gross deterioration in nutrients in the scrubland. The natural forest had deeper soil and humus than degraded forest. Soil depth was extremely shallow in scrubland. The value of NPK drops progressively in natural forest, degraded forest, and scrubland.

The biomass of the detritus in natural forest is 217.5 grams per square meter, in degraded forest it is 79.44 grams per square meter, in scrubland it is 25.71 grams per square meter, and in plantation it is 95.00 grams per square meter.

Summary of Findings of the Participatory Rural Appraisal

A survey of seven villages around Walwhan showed that though the settlements appear to be semi-urbanized, their dependence on forest resources is high. Forest biomass is collected for its consumptive use and as a source of income. It is also used for “rab” wood ash cultivation. Fuel wood collection is reported to take four to six hours a day and ranges between 10 and 15 kilograms for each head loader. The frequency of collection varies in different households from every day to about once in a week, depending on the amount they sell in the Lonavla market. Most head loaders and forest resource collectors are Katkari tribal people who are hunter-gatherers and have a high level of local knowledge of bioresources. This is mainly restricted to plant and animal species that they use, those that are dangerous and those that have religious sentiments. While all these have names, the rest of the species are clumped into an amorphous undifferentiated group, such as “jungli” plants and unnamed animals.

A major resource is grass for fodder and free grazing and browsing by livestock. This scrub cattle provides a vital source of dung fertilizer for crops and an alternative fuel source for wood during the monsoon.

There is a wide variation in the number of livestock owned by individual households. The average is about one cow, two or three buffaloes, and two bulls. The foraging area ranges from 1 to 6 kilometers from the settlements. The draw down of the lake during summer provides cattle with fresh grass that grows on the silt. During the early post-monsoon period, cattle graze closer to the villages and later move onto the plateau around the catchment. Cattle used for milk are stall-fed on crop residue or by gathering fodder from the forest. The distance from each village from where grass has to be cut ranges from 1 to 5 kilometers. Fuelwood and small timber for building houses is an important resource that the forest provides. The present level of extraction of fuelwood is not sustainable. Alternative methods of generating these “need based” resources have been suggested during conversations with local people.

More than twenty species of plants are most frequently used for food and other household purposes. These include tree species such as *Bridelia squamosa*, *Bauhinia purpuria*, *Syzygium cumini*, *Acacia concinna*, *Holoptelia integrifolia*, and *Tamarandicus indica*. Shrubs and ground flora are used for their medicinal value.

Nonwood-products such as fruit, fodder, leaves for plates, and strobilanthus for stakes and housing, are extensively collected. Wildflowers such as *Gloriosa superba* and the *Kurkurma pseudomontana* "Gauri" lily are collected and sold. There is a large-scale extraction of moss for floriculture. This has a negative impact on local biodiversity values. Several of these plants are reportedly becoming increasingly hard to find. An ex situ conservation and a reintroduction program have been initiated.

Local tribal people, mainly the Katkaris and the Mahadeo Kolis, are more heavily dependent on forest produce and fishing than Marathas and Brahmins. The fish are caught in the lake using nets, from paddies using saris and from *nalas* by complex basket traps. Women string their sarees between paddies not only to catch fish but also to act as a labor-free method of washing the saree. The complicated one-way fish traps used by the Kolis are made by a small group of highly specialized tribal craftsman, mostly from the Thakar community.

Hunting still continues. The most frequently hunted species include hare, wild boar, barking deer, porcupine, and monitor lizard. Large-scale trapping of quail, partridge, and jungle fowl occurs. The population of many of these species is now extremely low, and the threatened species of fauna may become extinct, at least regionally. The Malabar giant squirrel, the pangolin, and the mouse deer that were once common are now rarely encountered. Tigers that were frequently observed in this region up to the 1950s are now locally extinct. These findings have been a focus of the local SEEP that has generated more participation in the conservation of these species. Students have begun to appreciate that several of these plant and animal species that are still found in their area have become extinct elsewhere. Thus, they appreciate the need for urgent conservation measures to be developed.

TEC's Biodiversity Conservation Action Program

On the basis of research information a nursery of endemic plants has been established at TEC. Over forty species of local trees are grown in polythene bags, transferred to sacks, and introduced into the established *Acacia auriculiformis* plantations to enrich their biological value. It is observed that these plantations act as cover under which indigenous evergreen species have a higher rate of survival than in open scrubland.

During the last five to six years this has led to a phenomenal rise in local biodiversity, not only through the reintroduction of a number of species of local trees, shrubs and climbers, but through recolonization by mammals, birds, and insects in the young plantation. A major change has been observed in the walled-off area below the Walwhan dam. There have been repeated sightings of mammals such as leopard, civet, mongoose, and wild boar, and birds such as spur fowl, jungle fowl, partridge, and forest interior passerines such as flycatchers, thrushes, babblers, and a variety of insects. A dramatic increase in species richness and abundance has occurred over a short span of time. This demonstrates that by implementing a clearly defined ecorestoration strategy for a degraded area (that has relict populations of wildlife) the forest can bounce back into a relatively rich ecosystem.

A butterfly house has been developed for breeding local species of butterflies and moths, with a focus on breeding uncommon species for reintroduction into the wild. The butterfly house has eleven species of breeding butterflies and is used for field visits organized by our School Environment Education Program.

The TEC is well known for its Mahseer breeding facility that has developed the technology for a major ex situ breeding program for this endangered fish. The fingerlings have been sent to several parts of India to restock this fish in rivers from which it has disappeared.

These initiatives have prompted the TEC to develop a nature awareness area for local people and tourists. The forest now mimics the diverse natural forest ecosystem and is an excellent site for the study of plant life and the highly abundant insect and bird populations. Within the restored area, a wetland has been created by bunding off the spillway of the dam into shallow marshes. These marshes contain a mosaic of marshy reed beds and open-water areas in which fish, amphibians, and aquatic birds have begun to breed. The TEC has planned a major interpretation center at the site.

The success of school visits to the area led to the financial support to BVIEER to initiate a school environment program in fifteen Lonavla schools, for children from the economically deprived sections of society.

SEEP Supported by TEC in Lonavla and Confederation of Indian Industries (CII) in Pune

The BVIEER initiated a program for training schoolteachers in environment education in 1994. This led to developing an in-house program for training trainers and implementing environment programs in schools. Funds to run environment education programs in neighborhood schools in the urban part of Pune were provided by CII, which came from Kirloskar Brother Ltd., Bajaj Tempo Ltd., and Global Environmental Engineering Ltd. The three major supporters who felt that providing environmental awareness within schools would have far-reaching positive effects on the environment are Sanjay Kirloskar, Abhay Firodia, and Chandan Gadgil. Their personal support and conviction led to developing a three-year School Environment Education Program with several innovative locale specific aspects.

The TEC with its ability to have developed a major nature awareness initiative agreed to support a SEEP in schools in Lonavla and Mulshi. Dr. Homi Sethna, Shashank Ogale, and others initiated this program, providing BVIEER with a specific focus on covering the environment education and awareness needs of semi-urban and wilderness school students. During the last four years the BVIEER has involved more than 350 teachers, several of whom have attended more than one Teacher Training Workshop through highly innovative and need specific interactions.

The SEEP is used in over forty schools and is supported by highly trained and experienced coordinators who visit the school on a fortnightly schedule. They personally conduct locale specific program modules along with the teachers.

The programs that the BVIEER has conceptualized, designed, and implemented have gone through a complex phase of development at the institute. This includes pre- and post-testing to monitor the cognitive aspects of the program, an assessment of skills and field craft, as well as a documentation of actions initiated through attitudinal change induced by the program. The latter has been extremely difficult to quantify but has been expressed repeatedly by teachers and students through their own actions.

The SEEP has been a highly successful program. The role of both the TEC and CII in funding and supporting this effort is a unique initiative from the corporate sector. The pattern has changed the NGO clublike character of these activities that energizes only a small sector of interested individuals into a much wider community-based approach through a school level program, thus exposing more young people to nonformal techniques to formal curricula and helping to produce environmental consciousness.

The BVIEER conceptualizes and implements innovative SEEPs. This provides the institute with a remarkably direct and quantifiable feedback mechanism of the efficacy of its programs. The ability to alter the thrust of a program and create a highly locale specific module is its major asset. Over the years several strategies and guidelines have been established through this short feedback system.

1. Environment Education must be introduced into the formal education sector through the use of the techniques and methodologies evolved in the non-formal sector.

This leads to a widespread environmental awareness program at the school level. This is not possible through the localized outreach of the NGO sector. Although the NGO sector has created highly focused and locale specific initiatives, it has been unable to spread environmental consciousness beyond a relatively small number of individuals in the community at large. Only by introducing methodologies into formal curricula can this be accomplished.

2. Although schoolteachers can appreciate the value of introducing environment education into the curricula, their knowledge base and skills are limited by their training background, which has not included an adequate environment education component.

Short TTWs aimed at generating awareness are capable of bringing home only a few relevant messages. Without Teacher Training Handbooks and environmental education materials that are linked to existing curricula, most teachers are unable to effectively transfer pro-environment messages into their teaching program. They have serious limitations in stimulating their students into proconservation actions. The brief workshops have supported the training needs for class-based activities. But they have failed to bring about enough expertise on field interpretation of environmental issues, taxonomy, wilderness ecosystems, urban landscapes, or the actual demonstration of the structure and functions within neighborhood ecosystems such as ponds, rivers, hill slopes, forest patches, or seacoasts.

This indicates a need for a more in-depth training program through a longer and more intensive exposure to environment education and awareness initiatives for the teacher. This has led to the development of a diploma course in environment education for in-service schoolteachers.

3. A most effective initiative has been through activity based learning processes in the SEEP. Three approaches have been used:
 - i. Using posters with environment education worksheets.
 - ii. Converting school excursions into environment education and awareness initiatives focused on interpretation of local environment assets and problem sites.
 - iii. Organizing interschool environmental fairs with posters, models, dramas, and debates in which students, teachers, and parents actively participate in a one-day community event.

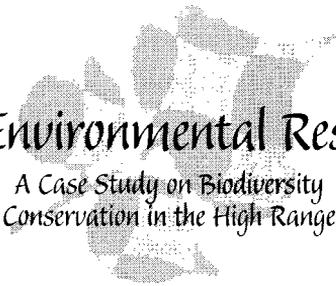
The school program for Lonavla schools have focused attention on understanding local land use patterns and the value of conserving the natural forest for its resources and as sources of local water regimes. It has dealt with creating an awareness of the uniqueness and wealth of the local species diversity of plants and animals through field visits to sacred groves, and audiovisuals specifically designed around the local ecosystem and species diversity.

In Pune schools a greater degree of attention has been placed on urban issues such as air and water pollution; garbage management; the need for a more equitable distribution of resources (such as water and housing space); and the dependence of the growing mega-city on the rural and forest ecosystems of the Western Ghats. The modules have used technologies such as field observations, role plays, audiovisual shows, painting, drama competitions, and informal interactions with environmental educators. A close

rapport has grown between schoolteachers and program coordinators. School children anxiously await each program as it is considered exciting and fun. The fact that each program is related to their curriculum frequently results in additional learning. It comes as a surprise—this awareness that several aspects referred to in standard, boring classrooms are closely linked to exciting local environmental issues. A major focus has been to create a feeling of enjoying nature for its own sake. Perhaps this has been our greatest success.

Conclusions

Our environment-related activities have demonstrated the need to innovate and adapt corporate environmental initiatives to local situations. A great need exists for researchers to design and re-create natural ecosystems. Biodiversity conservation is a major field in which corporate organizations should take a leading role. Corporate initiatives must focus on innovative environmental awareness activities that provide information, lead to concern for the environment, and initiate action programs at the community level. The future scope of corporate environmental initiatives should cover the widening canvas of possible environment-related initiatives at the local and regional level.



Corporate Environmental Responsibility:

A Case Study on Biodiversity Conservation in the High Range

T. Damu

“Dig out the riches but do not strike her heart,” admonished the Atharva Veda. In its mad rush for economic betterment and industrial development, the human race has devastated the riches of Mother Earth, leading to irrevocable ecodegradation and species endangerment. Today the world is facing a biodepletion crisis.

Scientists have long sounded a red alert about hundreds of deleterious and environmentally degenerative happenings in the world, including the greenhouse effect. In cities, the ill effects of industrialization loom large in the sky as smog and acid rain-bearing clouds. On the ground, effluents threaten all forms of life and the environmental equilibrium. Unfortunately, corporations are creating some of these problems.

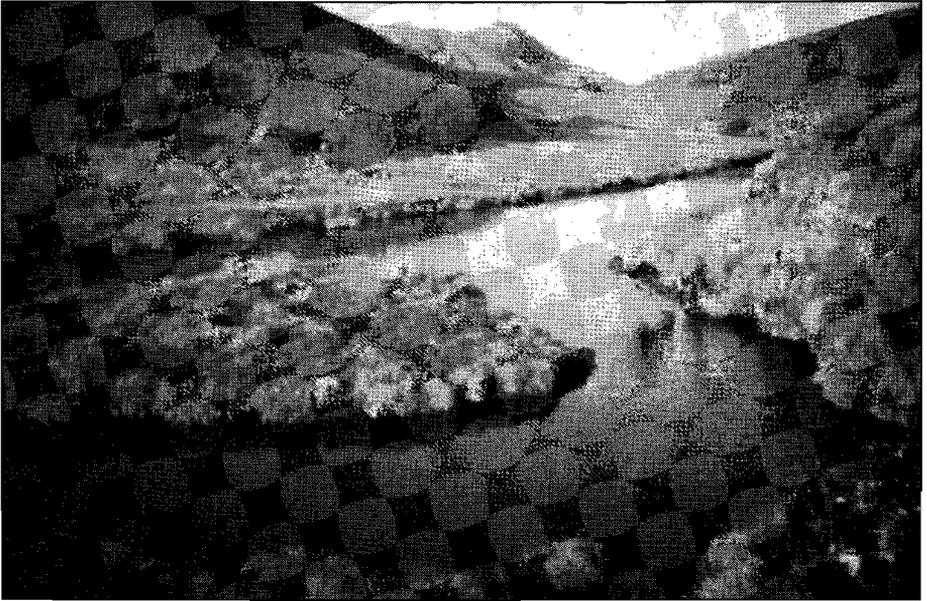
Among the twelve mega-diversity countries in the world, India enjoys a seeded position. Species richness coupled with enormous genetic diversity is unique to the Indian bioscenario and make India one of the Vavilovian Centers of diversity. Out of the eighteen global “hotspots” of biodiversity that represent high areas of endemism and significant threats to imminent extinctions, two lie in the Indian subcontinent, namely the Western Ghats and the East Himalayas.

The High Range

This term usually refers to the high mountain ranges in the Western Ghats of Kerala, which contain the highest peak south of the Himalayas, Aneimudi, and one of the most beautiful plateaus, Eravikulam National Park. A major portion of the High Range is called the Kanan Devan Hills, which abounds in a wealth of flora and fauna. The Kanan Devan Hills Produce Company first practiced holistic environment preservation in the High Range beginning in 1928. Since that time, and including the current efforts of the Tata Tea Company, which plants in the area now, rich biological heritage has been preserved in this region.

The verdant Kanan Devan Hills are a botanist’s paradise and contain a fascinating variety of herbage and are a haven for bird-watchers and animal lovers. The red rhododendron is unique to the area, and a wide variety of rare flowers and more than forty kinds of orchids grow in the ground, trees, and rocks. The neela kurinji (*Strobilanthes kunthianus*) is also unique to the area and flowers only once every twelve years. In the lower elevations are many unique tree species.

The famous 105-square kilometer Eravikulam National Park is located in the High Range and is an integral part of the vast stretch of forests extending from Anamallais to the Palani Hills of Tamil Nadu. The park contains the unique *shola* grassland ecosystem at an average elevation of 2,000 meters. The climate here is temperate, and the rolling grasslands hold the thin topsoil in place. The area has remained



A stream in Eravikulam National Park. PHOTO COURTESY OF T. DAMU.

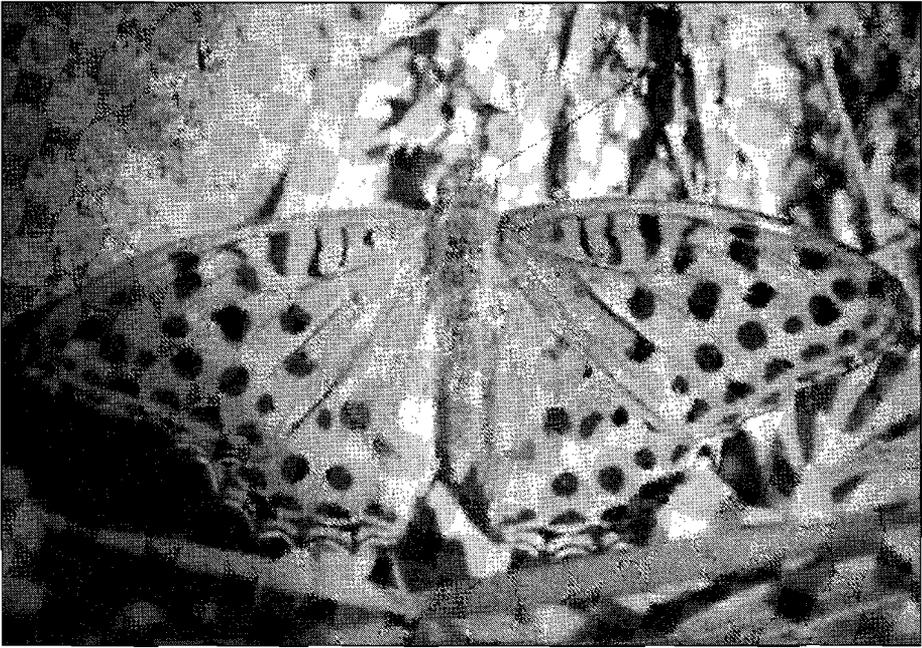
undisturbed by humans from time immemorial. Because of the ecological, floral, faunal, and geomorphological significance of this area, it is listed as one of the environmental hotspots in Asia.

The Nilgiri tahr (*Hermitragus hylocorius*), an endangered and extremely rare type of mountain goat, is protected in Eravikulam National Park. More than half of the total world population of these goats, numbering more than 1,000, live here. Indian gaur, Malabar squirrels, and a wide range of wild animals, including wild dogs, leopard cats, tigers, lion-tailed macaques, Nilgiri langurs, and barking deer all inhabit the High Range. In addition, many birds, such as the Malabar whistling schoolboy, pipit, and rufous-backed shrike; and butterflies, such as India's largest butterfly, the southern bird wing, Paris peacock, Indian fritillary, and yellow pansy, all provide a visual feast in Eravikulam Park.

Tata Tea

Tata Tea, the world's largest integrated tea company, is a pioneer in many business strategies, including its practices in corporate environmental responsibility. In addition to fulfilling its statutory obligations with regard to every aspect of corporate citizenship, Tata Tea takes initiative in implementing innovative extrastatutory practices in environment preservation and biodiversity conservation in the High Range. The Tata Code of Conduct on Environment states:

A Tata Company shall strive to comply, in the conduct of its business affairs, with all regulations regarding the preservation of the environment of the territory it operates in. A Tata Company shall be committed to prevent the wasteful use of natural resources and minimize any hazardous impact of the development, production, use and disposal of any of its products and services on the ecological environment.



Indian Fritillary. PHOTO COURTESY OF T. DAMU.

The Strategic Initiative

The pioneer planters of the Kanan Devan Hills exhibited the spirit of conservation. In November 1928 the founding fathers of these teeming plantations established the High Range Game Preservation Association. The main objective of this association was to control the indiscriminate killing of animals. Association members served as honorary wildlife wardens.

In tune with the changing times, when newer ecological perspectives emerged globally, a new grower, Tata Tea, formulated a dynamic plan for comprehensive environmental management and sustainable development for the High Range. The result was the High Range Wildlife and Environment Preservation Association, a unique foundation for biodiversity conservation within Indian corporate history.

Joint Management of a National Park

The Kanan Devan Hills Produce Company voluntarily handed over control of the Eravikulam area to the Government of Kerala with a recommendation to declare Eravikulam as a sanctuary. Later, in 1978, after Tata Tea was in business in the area, the High Range Wildlife and Environment Preservation Association persuaded the center and state governments to elevate the area to a national park, the first one in Kerala. The park is now managed by the Forest Department in collaboration with Tata Tea and the Muthuvans, who are the original inhabitants of the High Range.

The Muthuvans are the best stewards of the natural resources in the area. Hence, Tata Tea employs many tribal people. Tata Tea is also helping the Muthuvans improve their health and hygiene, education, and standard of living through the Tata Tea Community Development and Social Welfare Scheme. Select Muthuvans have been trained as barefoot doctors; the company organizes free medical camps in the *kudis*

(hamlets); and general medical care and referential treatment in the company's hospital are rendered free of cost. In addition, Tata Tea organizes biennial meetings with the Muthuvan *kaanis* (headmen), government representatives, and forest officials to help solve the problems of these tribal people.

If this joint management concept in protecting forests, national parks, and sanctuaries could be emulated by the Forest Department in other areas, there would be a tremendous improvement in the bioreserve of natural wealth in India. This example of corporate environmental responsibility could also serve as an international model.

Shola Rejuvenation

The Tata Tea Company protects and scientifically upgrades large tracts of *shola* forestland in the High Range. In the early 1990s the company sought technical training from the Palani Hill Conservation Council to upgrade these areas. The Council trained an employee of Tata Tea in seed collection and nursery procedures for raising the *shola* tree species. This employee identified and collected seeds of plants that are part of the *shola* forest ecosystem, and the Tata Tea Research and Development Department raised many seedlings.

In January 1995 one worker per estate was selected from all twenty-four company estates in the High Range and trained in seed collection and nursery procedures. Following this, Tata Tea started large-scale plantings of saplings native to the degraded forests. Every year, a considerable amount of money is allotted in the Tata Tea budget for maintaining and promoting these areas.

Shola degradation due to natural calamities and human-made disasters is thus eschewed by this peerless in situ propagation. The perils of deforestation are well known. Preserving natural levels of biodiversity is imperative in not only saving individual species but in retaining the complex network of species relationships.

Kanan Devan Nature Clubs

The Kanan Devan Nature Clubs, which are affiliated with the World Wildlife Fund and sponsored by Tata Tea, inculcate environmental ethics in the minds of the approximately 25,000 Tata employees, approximately 6,000 Tata estate school children, more than 2,000 scouts and guides, and the public. The clubs organize various environmental awareness activities and celebrate Earth Day, World Environment Day, Energy Conservation Day, National Forest Day, and Wildlife Week. Tata also organizes the popular Kanan Devan Nature Club activities in the twenty-one women's colleges in Kerala. Today's young women are tomorrow's mothers and become the pivotal centers of their families, passing on many inherited values to their children.

Nourishing the Grassroots

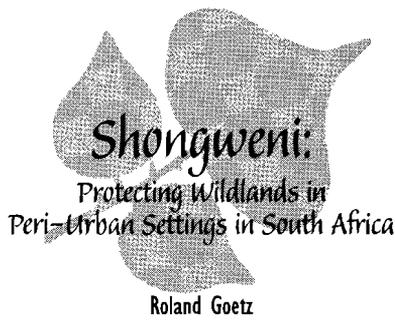
About 25,000 permanent employees are on Tata Tea's payroll in the Munnar region, and the total population of the estates area is more than one *lakh*. In order to have an effective communication channel between the management and the estate employees, Tata established the Link-Workers Program. The participants are volunteers from among the company estate workers who are doing commendable work in health education and creating environmental awareness among other workers and their families. This system nourishes ecoresponsible behavior at the grassroots level.

The one *lakh* people living in and around this plantation region assist in the protection of wildlife and forestland in the High Range. Whenever outsiders try to enter the nearby forest area with malicious intent

such as poaching or encroachment, these attempts are prevented and reported to government authorities. This has helped preserve the wildlife in and environment of Munnar. This system of people's participation in environmental preservation is one of the main reasons for the success of Tara Tea in biodiversity in this area.

Think Globally and Act Locally

The slogan "Think Globally and Act Locally" is followed to the letter in the High Range. The environmental problems there have local, regional, national, and global ramifications. Hence, any foul play with Mother Nature cuts the region's own sustenance. The Tata Tea environmental practices of joint management of Eravikulam National Park, financial support of the High Range Wildlife and Environment Preservation Association, education opportunities through the Kanan Devan Nature Clubs, and nature study sponsorships are eye-opening examples of corporate environmental responsibility. In the next millennium, corporate environmental responsibility will quickly emerge as one of the most positive and viable steps in nature conservation.



Shongweni:
Protecting Wildlands in
Peri-Urban Settings in South Africa

Roland Goetz

Conservationists face an endless battle against the effect people have on the environment, whether they live in formal or informal settlements, within reserves or on their boundaries. This is evident from reports of squatters in the Zululand's vital Dukuduku Forest whose use of slash-and-burn farming methods are wreaking havoc on the ecology of the area.

In other conservation areas near Durban, KwaZulu-Natal, bark stripping, erosion, poaching, deforestation, litter, and the pressure of domestic dogs are a few of the problems reserve staff have to combat. To come to terms with these problems, the needs of the surrounding communities need to be addressed. This has to be done in a sustainable way to ensure that any development can address the needs of the people and at the same time ensure the environmental integrity of the area. In this case sustainable development can most effectively be defined as “[development that] meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland). Clearly the Brundtland statement has a strong people-centered ethical stance, which concentrates on satisfying human needs rather than on protecting the environment in general or on protecting other species.

In the developing world, the harsh reality of life dictates that the approach adopted needs to ensure that communities' needs are recognized. The number of desperately poor people, “the global underclass,” has remained steady at about one-fifth of the human race. These are people who live on the edge of survival. Their living conditions, housing, health, and nutrition are an insult to the notion of equity.

For more than a century people have wanted to preserve species and ecosystems, but during the last few years the loss of biodiversity has been viewed as a threat to sustainable development. Against this background the macro-micro-management strategy has been employed by Msinsi (a private conservation company) to protect wildlands in peri-urban settings located in the province of KwaZulu-Natal, South Africa.

This story begins with the Shongweni Dam, which was originally Durban's largest source of potable water and was owned and managed by Umgeni Water, the local water authority since 1983. The dam's capacity had been considerably reduced by siltation during the 1959 floods; the floods of 1987 aggravated the problem. For this and other reasons, a decision was taken to decommission the Mlazi system, including Shongweni Dam.

Conscious that the 1,700-hectare Shongweni Estate would inevitably become environmentally degraded unless properly managed, and aware of its biological importance and its potential as an ecotourist attraction, Umgeni Water began searching for an organization that would undertake the estate's management as a nature reserve. After the Natal Parks Board, the KwaZulu Bureau of Natural Resources, and the Wildlife Society had turned down the opportunity, Umgeni Water commissioned a strategic planning exercise involving Dr. Ian Player, the founder and vice chairman of the Wilderness Leadership School (WLS).



Dr. Ian Player (on right), the founder of the Wilderness Foundation, and Magqubu Ntombela, who chose the *Erythrina* leaf to be used as a symbol. Photo courtesy of Roland Goetz.

Dr. Player was convinced that the Shongweni Estate, properly managed, would be both environmentally important and potentially profitable.

Dr. Player proposed to Umgeni Water that the WLS take over the management of the Shongweni Estate. In order to avoid endangering the WLS's tax-exempt fund-raising status, it was necessary to undertake this through a new company, Msinsi Holdings (Pty) Ltd., with 100 percent equity held by the Wilderness Foundation, which administers trust funds on behalf of the WLS.

The Shongweni Resources Reserve (SRR) was formed in April 1992, formally taking over control of the estate in August of the same year. As Msinsi's first project, the SRR was developed along ecotourism lines, drawing on the local community to create infrastructure to take advantage of the opportunity the reserve provided as a financial catalyst for the area.

Msinsi was later appointed to develop and manage the environmentally sensitive Nagle Estate and Inanda Dam environs in a sustainable manner to preserve the water quality of Durban's main storage dams. In a fourth project, the organization was appointed to assist with the development and continued enhancement of the well-known public bird-watching area at Darvill Wastewater Works. Albert Falls and Hazelmere Resources Reserves were acquired when the Natal Parks Board chose to withdraw from these areas.

Operational Philosophy and Approach

Drawing from the Zimbabwean "Campfire" philosophy, a model for community conservation in Africa where communities are responsible for their own success, Msinsi has created a blueprint for the sustainable uplifting of communities within an ecologically sensitive area. With Msinsi Holdings making use of other external organizations such as the KwaZulu Training Trust's Community Empowerment

Programme, local development committees and regional development liaison committees are established in the local community. This procedure involves working with communities at the grassroots level and creating institutional capacity.

This work has included training elected community representatives in the areas of financial skills, committee training, management, and functional literacy. Further training offered to community members includes building skills, plumbing, life skills, water conservation, and water-health education.

The Msinsi Holdings logo, the three-part erythrina leaf, supports the organization's trimodular approach to address the challenge of integrating conservation and sustainable community development. This approach includes environmental management, sound human resource development, and application of business and financial principles through the following:

- identification and documentation of natural resources in the form of a natural inventory;
- identification of possible threats, both current and potential, to the quality of the environment; and
- establishing the needs of the surrounding local communities, with respect to natural resources utilization and uplifting of their standard of living.

Once these initial steps had been established, the management developed a pro-active management plan. This plan addresses the above three steps and achieves the ultimate goal of successfully integrating conservation and sustainable rural community development at Msinsi areas, where the ecological quality of the reserve improves and the local communities enjoy the benefits referred to above.

The proactive management plan constitutes two main sections, namely macro-scale management goals and strategies and micro-scale management strategies.

Macro-Scale-Management Goals and Strategies

Community Liaison and Participation

The critical variables that could lead to the success or failure of the Msinsi project are the perceptions, attitudes, and actions of the local communities residing on the boundaries of the reserve. Consequently, it is critical that the position and policy of Msinsi be conveyed to the community at large, and in particular, the mutual benefits that can be enjoyed by a partnership approach.

Therefore, it is essential that all macro-, as well as some micro-, management strategies be discussed with the communities and that these management strategies focus to a large extent on extensive community participation. Macro-management strategies would then all include community liaison and participation as essential elements.

The first and all-embracing strategy would be to provide education for all sectors of the community (i.e., both young and old), concerning the importance of resources conservation and population stabilization. Here, it is important for governmental and nongovernmental bodies to offer formal, as well as informal, education to the people.

The second strategy would be to improve maternal and child health care, addressing aspects such as:

- developing parental and postnatal care at local levels;
- educating whole families on the importance of simple hygiene; and
- offering locally available family planning services.

Thirdly, it is important that opportunities exist for families, and that they are encouraged to become economically and socially self-sufficient. This would negate one of the traditional reasons for large families. This has been achieved by encouraging communities to use their traditional craft skills, not only for economic gain (via tourism), but also to promote their heritage and social stability. Experiential learning has also been facilitated to expose communities to conservation and its benefits.

A novel concept that is being planned in Msinsi areas is the idea of community-controlled conservation camps. Here, areas of community land adjacent to the reserve can be fenced into the reserve. In these areas bush camps or similar overnight accommodations will be built. These camps will be maintained and administered directly by the community, and all monies will be utilized for the development of the various communities concerned. The conservation and fencing expenses could be paid for by the reserve. This concept has the potential to create economic opportunities that can contribute to both economic and social independence. If relevant education, affordable and easily available health care, and adequate economic opportunities are created within the context of the local community, the long-term goal of population stabilization and resource conservation could be attained.

Baseline Study, Evaluation, Monitoring, and Trends

Environmental and socioeconomic baseline studies for areas in which Msinsi operates are as important to the success of the project as the community integration mentioned earlier. Baseline studies are important because they enable the project management to evaluate situations and monitor trends and progress. Potential problems can either be avoided or met with timely and appropriate responses.

MICRO-SCALE-MANAGEMENT STRATEGIES

Micro-management strategies relate particularly to activities within the boundaries of the reserve. These management programs, as set out in the reserves management plan, strive to conserve the optimum number of appropriate indigenous species and their habitats, maintain breeding populations, and protect these gene pools. Natural, physical, and ecological processes will be allowed to operate without interference except under imperative circumstances, and at the same time allow utilization of the reserve for educational, research, and recreational purposes. Further, any imperative consumptive utilization of a renewable natural resource must be sustainable and not in conflict with recognized conservation morals.

Land Use Categories

The reserve must be divided into a number of zones. Only those activities relating to policies for each zone will be permitted.

INTENSIVE USE ZONES

Areas characterized by substantially modified natural environment. Sights and sounds of humans are readily evident, and the concentration of users is often moderate to high. This zone includes accommodation, camping and caravanning sites, staff housing, service facilities, high-density recreation, and so on.

LIMITED USE ZONES

Areas characterized by a predominantly natural environment with moderate evidence of the sights and sounds of humans. Rustic facilities such as picnic sites, bush camps, game guard outposts, and game-viewing hides may be provided. Roads for motorized public transport are provided.

WILDERNESS ZONES

Areas characterized by lack of access roads open to the public.

SPECIAL ZONES

A special zone is an area set aside in recognition of an important site that would receive the highest conservation priority and may require special protection measures. Examples of such sites are breeding sites of rare species, rare or endangered ecosystems or components, important historical and archaeological sites, areas occupied by species of limited distribution or special significance, sites for long-term research or monitoring, and ultrasensitive areas.

Management of the reserve would include soil conservation, vegetation conservation, and maintenance of diversity and breeding populations of the indigenous plant species occurring in the reserve. Fire management forms part of this area of management as does the control and elimination, where possible, of unwanted alien plants.

Conservation of fauna includes maintaining diversity and breeding populations of indigenous animal species occurring in the reserve, the removal of alien species, and the restocking of animal species that historically occurred or are deemed important for either conservation or ecotourism reasons. Fisheries and hatcheries also form part of this management objective.

The protection of catchments and water resources; the control of any source of pollution; and the management and preservation of archaeological, paleontological, and historical sites are all part of the conservation efforts. Research necessary for the effective management of the reserve to achieve set objectives is carried out in both the short and long term.

Administrative management ensures that all infrastructure is properly maintained in an acceptable state of repair. The erection and maintenance of suitable fences so as to control animal movement; to demarcate boundaries of the reserve; and to protect personnel, their possessions and/or any equipment and building against theft, damage, or destruction from human or animal sources.

Other areas include the provision of services to visitors. This includes controlled usage by visitors to the best extent compatible with conservation requests.

The control and management of finances is carried out to ensure the effective running of the reserve. These broadly cover the micro-management strategies.

Conclusion

In order to conserve natural resources in developing countries, the needs of local people must be considered, while applying sustainable methods. Partnerships need to be developed by all stakeholders to ensure that “the real solution will be found in reinventing and finally healing the relationship between people and the earth” (Gore, *Earth in the Balance*).

EDITOR'S NOTE: The Msinsi Holdings (PTY) Ltd., a private conservation company, applies sustainable environmental management principles in developing communities with sound business practices, to continually uplift the human spirit.



Corporations Today:

Responsibilities to Ensure
There Will Be a Tomorrow

Herbert F. Kroll

The word *corporation* is a generic term, related to the Latin word *corpus*, meaning something integrated, not individual. A *corporation* describes any public or private association of employers and employees in an industry or trade, including governmental and nongovernmental organizations. Due to their numbers and influence across the world, corporations play an integral role in the global environmental movement.

The Rio 1992 Agenda 21 Results

In 1992 representatives from 170 countries met in Rio de Janeiro, Brazil, to make a collective effort to improve the global environmental situation. There were great expectations for this first-ever conference, and though much disappointment followed the conference, there were also many positive results (using data mostly from financially well-to-do countries) that affected the corporate world.

First, conference representatives agreed to work toward achieving a worldwide, though nonuniform, reduction in pollution within the projected feasibility of individual countries. Second, in order to avoid inventing the wheel twice, conference representatives agreed to intensify exchange of information across the borders, and particularly to increase cooperation between “developed” and “developing” countries. Third, some representatives from European countries agreed to have environmental area managers installed in particular countries. For example, Germany has set up offices for such managers in India, Indonesia, Malaysia, Thailand, the People’s Republic of China, Poland, the Czech Republic, Hungary, Brazil, and Mexico.

The India–Germany Connection

It is certainly not accidental that India and Germany are working together on corporate environmental issues today. As a matter of fact, there has been a close interaction between these two countries for decades on pollution laws, to the extent that most of the specifications in India on effluents and maximum limits on air pollution are, to a great extent, blueprints from the German regulations, which are largely the strictest worldwide. Only some U.S. states have stricter regulations, particularly California with regard to exhaust emissions.

This makes it easy for German companies to settle in India, since they deal with the same environmental safety parameters as at home.

India's Environmental Rules and Regulations

The central government in New Delhi sets all the environmental rules and regulations for India. However, enforcement rests with the state governments. It is this dichotomy that leads to problems. There would not be a single polluted river in India if everyone just abided by the law.

Two other great misunderstandings are that required environmental investments render a company unviable, and proper maintenance of effluent treatment plants, run by corporations, negatively affect state budgets.

On the positive side, India is one of a few countries that has, in addition to the Ministry of Environment and Forests, a Ministry for Non-Conventional Energy Sources. This is a laudable approach to environmental issues and indicates that India means business and is willing to face future environmental challenges.

German Packaging Ordinance

There are corporate changes being carried out today that have a positive impact on the global environmental crisis. One of them is the German Packaging Ordinance.

Germany has set ambitious waste-policy goals and has taken the necessary measures to achieve them. The Packaging Ordinance, with its philosophy of comprehensive product responsibility, is an innovative concept for avoiding unnecessary waste and recycling. Though the country is still dealing with initial teething problems, the concept has proved to be an overall success. Other European countries have also introduced similar regulations.

The ordinance, introduced in 1991 by the German federal government at the behest of the Ministry of Environment, stipulates that all packaging enterprises, importers, traders, and materials suppliers are obliged to use a minimum amount of environmentally compatible and recyclable packaging materials. It also obliges packaging manufacturers and distributors to accept the materials for return after use and to either reuse or recycle them.

A combination of two systems has made this a successful program. The first is a corporation called Dual System Germany that runs 300 recycling plants, which has created 18,000 jobs. Six hundred individual German companies founded the corporation and all are shareholders in it. Each company is issued a Green Dot Certificate for meeting the aforementioned criteria and pays an annual license fee, which finances the corporation.

The second system is a combined community program of regional waste collection and citizen education. These efforts deal with not only the practical issues of waste removal but also help to teach citizens about unnecessary waste by encouraging them to sort waste at home.

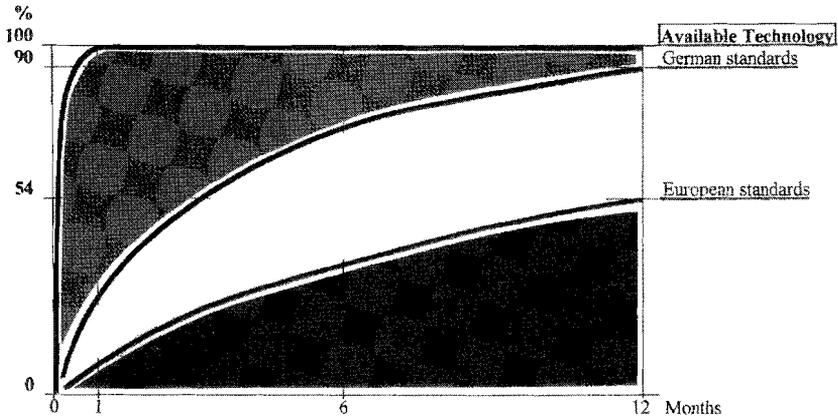
Biodegradability

Another corporate change having a positive impact on the global environmental crisis are the strict standards being applied to the term *biodegradability* in Germany.

This is a tricky subject because more people speak about it than actually know about it. A simple remark like "this product is biodegradable" qualifies a product somewhat, but not enough.

BIODEGRADABILITY

LAW OF NATURE/"LAW" BY MAN - THE ASYMPTOTIC PROCESS EXAMPLE: DETERGENTS



Basically, the process of biodegradation is a chemical process in which substances are broken down—mostly by way of oxidation—into elements that are considered harmless and are abundant in nature. Some end results are water and carbon dioxide.

This process is asymptotic and follows the curvatures shown in figure 1. Using the example of detergents as shown in Figure 1, biodegradability is measured in two ways.

First is the oxygen needed for degradation. The less oxygen needed, the better. This particularly applies to rivers or water in general, where foam is built up as a serious indication of insufficient oxygen content in the water.

Second is the time required to achieve a 100 percent biodegradation. Since this process can take a period of months or years and, in some cases, many thousands of years, tests are standardized on a twenty-one-day period. Since the process is asymptotic, as mentioned earlier, the time required for a 100 percent biodegradation can be calculated using exponential calculation.

Normally, the period of one year is considered as a baseline for the performance of a detergent's biodegradability, which is what figure 1 shows: 100 percent over a span of one year.

Various countries have sought to achieve different norms for biodegradability over the course of one year. Germany has determined a 90 percent biodegradability, which is the toughest determination in the world today. All other European countries have agreed to 60 percent of the German limit, which is less, but doesn't seem too bad. However, looking at the difference over time, it is remarkable. As per the German regulations, a 100 percent biodegradability would be achieved after two years, but the same result, according to the European regulations, would take more than seven years. Consequently, detergents regulated with the European guidelines continue to contaminate rivers and waters over many more years more than detergents regulated with the tighter German guidelines.

Both of these standards are low by comparison to today's available technology. There are products currently in the market, including the Indian market, that are achieving a 100 percent biodegradability within

just one month, at no extra cost. The difference between this standard and the Getman standard (shown in the green field in figure 1) is remarkable.

Figure 1 is also meant to be used as a campaign tool to create awareness among detergent consumers, encouraging them to choose the least harmful products for the environment. Consumers will want to avoid products in the red field, at least purchase the best products in the yellow field and, better yet, try to find the products in the green field.

The Story of the Seventeen Trees

A third corporate change having a positive impact on the global environmental crisis comes from a personal anecdote. About ten years ago, when I was a newly appointed technical director in Bangalore, I showed my wife around the company.

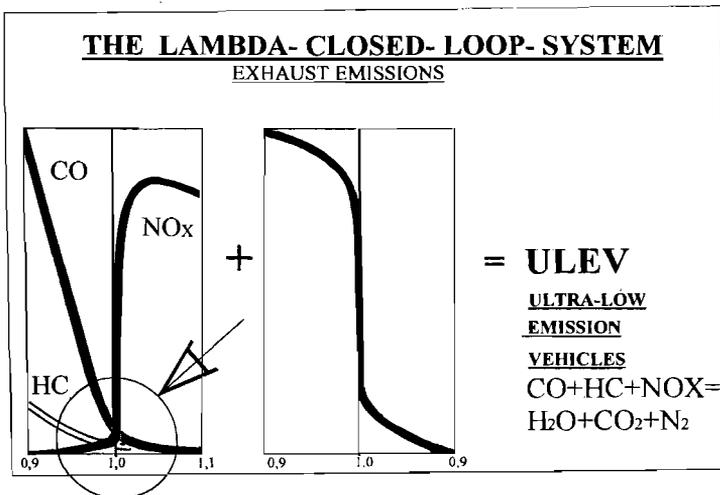
We used to ship our products in small wooden crates all over the country. These crates were supplied by an outside party and stacked in hundreds and thousands in the yard. My wife murmured to herself, "What a crime," and took up the issue with me at home that evening. To cut a long story short, I calculated that we were using seventeen fully grown trees daily by converting them into crates. A simple calculation revealed that, in working 299 days a year, we were using up more than 5,000 trees a year for packaging material.

The action we took was twofold. First, my wife took charge of a tree plantation program, which the company funded on one condition: that there was a guaranteed survival rate of 100 percent. Today, after eight years of planting 5,000 trees per year, Bangalore and its surrounding areas are richer by 40,000 surviving trees from this one campaign.

The second action was to replace the crates with strong cardboard, which reduced our transportation costs substantially and our wood-products use.

The Lambda-Closed-Loop Control System

At first sight, figure 2 looks like a puzzle or a rebus. What it depicts, however, is how delicate actual natural balance is.



The subject of figure 2 is exhaust emissions and how to achieve vehicles that are classified as ultra-low emission vehicles (ULEV), as per U.S. standards. The solution lies in a combination of two laws of nature, so to speak. After studying the composition of exhaust emissions, the first law determines that the toxic elements in the exhaust gas (carbon monoxide, oxides of nitrogen, and partly burned hydrocarbons) reach a combined minimum air-fuel ratio of exactly 14.7 to 1 (i.e., when the engine provides 14.7 kilograms of air, which is close to 10,000 liters of air, or 10 cubic meters, to a liter of petrol). This is called the Lambda 1 point. However, how does one ensure this exact ratio, which has a tolerance of around 0.1 percent deviation only? The minute one deviates from this narrow window, either one or the other component goes out of control.

A second law of nature bridges the gap. A special combination of ceramics and platinum exposed to exhaust gas changes electric properties instantaneously at the point of Lambda 1. This discovery, called the Lambda-Closed-Loop Control System, makes it possible to exactly admeasure air to fuel to achieve the absolute minimum under all driving conditions.

What is sometimes called an invention is actually a clever application of two laws of nature. Industry makes use of this combination of laws, otherwise totally unrelated, which has lead to results not dreamed possible. The lesson learned here is to study Mother Nature carefully and copy her whenever possible.

It is easy to blame the corporations for not paying attention to Mother Nature; they are somewhat anonymous bodies. However, outstanding individuals are spearheading the examples highlighted above on behalf of their companies or government organizations. In other words, there are no anonymous corporations on which we can off-load environmental responsibility. The job is ours, ours as individuals, yours and mine.



Industrial Ecology and Living Machines

Michael Shaw

At the Findhorn Foundation in Scotland, I learned to relate to nature in three ways.

Unity is the first way. As we expand our psyches to be as large as the world, we experience ourselves as nature and also as part of nature. Particularly in the wilderness we can have flashes of this peak experience of unity at a transpersonal level. Then everything seems to fall into alignment.

Cooperation with nature is the second way. We learn to work with nature like a good gardener. We see all processes as part of natural ecosystems and we are in wonder and awe of the power and sophistication of nature's elegant ecologies. The fundamental idea here is not one of human dominance over nature, but living as part of nature.

Seeing nature as our teacher and as a model is the third way. The motto "*Natura mater et magistra*" ("Nature Is Both Mother and Teacher") applies here. In fact, industrial and development processes can be modeled on natural ecosystems. For example, some years ago my partner, Dr. John Todd, an eminent Canadian biologist, and I were designing an engineered ecology to treat toxic sludge from the bottom of a highly polluted canal in Tennessee. John's design method was to look at the anatomy of the catfish and model the dimensions and ratios of our engineered systems on the guts of the fish. The catfish can digest sludge, demonstrating a highly functional and elegant natural breakdown process. We could not do better than use this knowledge in the design of our systems. Bench scale tests that followed confirmed the basis of the design model.

In order to build a sustainable future, industrial activities need to be designed as living systems, participating in natural systems. Wilderness is the primary natural ecology.

Industrial Ecology

The field of ecological design and its application to industry, which is industrial ecology, is relatively new. The United Nations University calls this approach *ecorestructuring*. The fundamental idea is to move beyond the typical industrial production and consumption models, which are linear and mechanistic, to closed-loop systems, which are similar to natural ecosystems. So, for example, we design an industrial plant or a new town or a hotel as a living system, which is an integral part of the bioregion. The inputs and outputs of the human-engineered facilities are seen as typical of natural ecological subsystems, and the wilderness is used as an example of the greater ecology in the design process.

At present, our industrial processes emphasize the moving of materials and energy from nature through the economic system as the primary way to "create value." The main economic activities are, therefore, producing and consuming. We might contrast this to a mature forest or pond. In these natural systems the processes of production and consumption, including recycling of wastes and nutrients, are balanced

processes. On the forest floor, the decomposing organic matter recycles the nutrients and nurtures the trees. The limnology of a pond is a wonderful example of many interacting systems, with constant changes in the ecology, but which has a stable overall effect on the environment. The system balance and stability is only disturbed when we overload the pond with pollutants or too many nutrients from human activities.

Natural ecosystems are stable systems. Species diversity reinforces the stability of these systems with redundancy in function. They are capable of self-organization, self-repair, self-reproduction, and a great ability to adapt to perturbations in external conditions. If industrial processes can have these same positive attributes, they will be highly effective and even restorative.

Dr. Devaki Jain described a paradigm shift in our culture involving gender and attitude. She recommends that instead of seeing life as mainly centered in the workplace (which is more of a masculine attitude), we shift our primary focus to the family (which is more of a feminine attitude). With such a shift, many of the decisions we make in government, academia, and industry will be quite different. A similar paradigm change is happening as we begin to think about industry as part of and not superior to or separate from nature. In other words, human economic and industrial activities are living systems participating in earth's natural systems, and not vice versa.

Hardin Tibbs said,

Model the systemic design of industry on the systemic design of the natural system ... industrial ecology involves designing industrial infrastructures as if they were a series of interlocking human-made ecosystems interfacing with the natural global ecosystem.... The aim of industrial ecology is to interpret and adapt an understanding of the natural system and apply it to the design of the human-made system, in order to achieve a pattern of industrialization that is not only more efficient, but which is intrinsically adjusted to the tolerances and characteristics of the natural system.

Living Machines

By modeling our human-engineered systems on their natural counterparts, we can be aligned with the natural world and experience the benefits of integrated design. Engineering science adopts a whole systems approach, such as with Living Machines.

Dr. John Todd, who has won many awards for his work in designing biological systems using the principles of ecological engineering, invented Living Machines. Living Machines can grow food, generate energy, clean the air, and heat and cool buildings, but their primary application is in wastewater treatment.

John and Beth Josephson laid out twelve basic ecological principles behind Living Machines in a paper published in the *Journal of Ecological Engineering*. According to the authors, the twelve principles are derived from the study of natural systems, which are then applied to engineered facilities. They include (1) an adequate mineral basis to sustain life; (2) nutrient flows and recycling; (3) steep gradients such as the transition from anaerobic to aerobic environments; (4) high exchange rates; (5) periodic and random pulses; (6) cellular design and the presence of at least three distinct and complete ecologies (e.g., pond, marsh, and meadow); (7) microbial communities; (8) photosynthetic basis of key ecologies; (9) a physical connection between the engineered system and the wild system; (10) species diversity; (11) the relationship

between microcosm and macrocosm; and (12) the notion of “as above, so below.” (I made the “as above” notion the twelfth point, though it may be describing the eleventh point. If so, there’s a missing principle, or two are combined.)

The basic principles in the field of ecological engineering were first put forward by Howard T. Odum in his book *Environment, Power and Society* almost thirty years ago. The fundamental idea is that, in addition to modeling human-designed systems on nature, we can use complete ecologies to carry out useful tasks. In addition, different ecologies can be linked to handle many inputs, self-manage a multitude of internal, closed-loop functions, and provide a variety of outputs.

We know that the pond, marsh, and meadow are capable of decomposition and regeneration in complex ecological cycles. In his work, John has used the abilities of these natural ecologies effectively and economically. For example, the organisms that are present naturally in the pond, marsh, and meadow, combined with sunlight and gravity, handle pollution. Other inputs, particularly energy requirements from fossil fuels, are minimized. The primary product is clean water. In addition, nutrients are recycled and other useful products can be harvested, such as fish and botanicals.

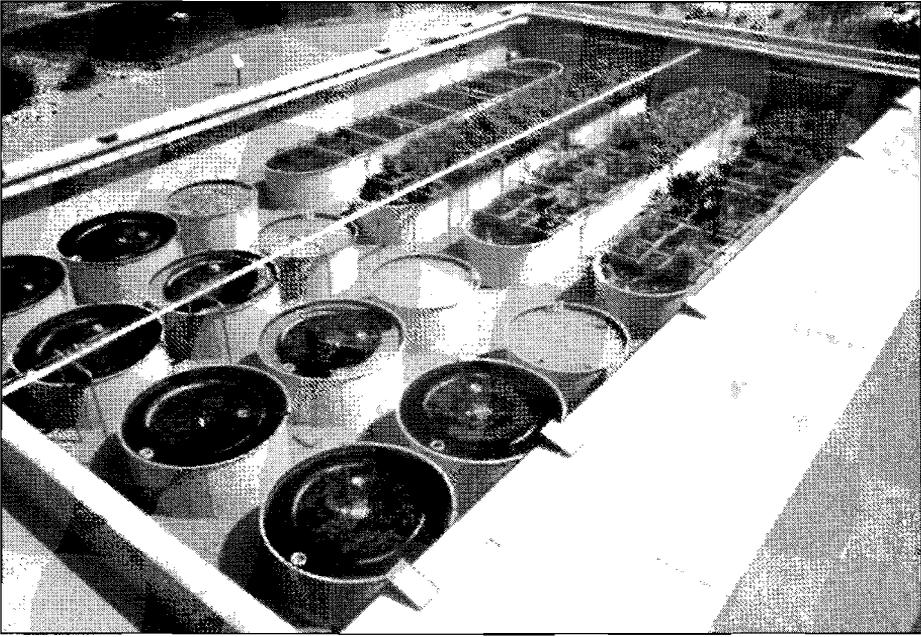
Ecologically engineered systems are capable of high treatment levels. In fact, removing the last bits of pollution from a waste stream is often more economical using natural systems than with conventional and chemical processes. Also, the beneficial features of natural ecosystems carry over to the engineered systems, providing operational stability due to multiple biological pathways, diversity of organisms in the system, and the ability of Living Machines to self-organize, self-repair, and self-replicate. We find that Living Machines treating food-processing waste streams, where there are wide variations in influent characteristics, are capable of providing stable, high-quality effluent.

A typical industrial wastewater treatment application is the Living Machine at the Mars food processing plant in Wyong, Australia. Living Technologies, Inc., built this facility in 1994. The Mars plant manufactures 350 products from more than 1,300 ingredients and generates a widely varying wastewater load (up to 400m³/day or 100,000 gpd). Here’s how it operates.

First, the flow is equalized in a balance tank, and the high fat content is removed by dissolved air floatation (DAF). The flow then passes to an up-flow anaerobic sludge blanket (UASB) digester, which provides a significant amount of treatment without using any external energy. In fact, if the organic loading is sufficient, methane can be produced, which can be used for steam generation on site. From the anaerobic reactor, wastewater flows to a closed aerobic reactor, with an odor control biofilter. The biofilter consists of humic material, which is mainly bark and compost. The odors are scrubbed by bacterial action as they pass from the closed tank through the humic layer.

The wastewater then flows by gravity to a series of open aerobic reactors, with plants racked on the water surface. The plant roots provide the media for microorganisms to attach and grow, which breaks down the organic materials in the waste stream. In addition, any ammonia is nitrified to nitrite and then to nitrate. As the bacteria go through their life cycles and die, they form sludge, some of which is consumed by other creatures in the system, such as snails. Living Machine sludge volumes are low compared to other wastewater treatment technologies because the ecologies digest organic materials as part of the process. However, excess sludge needs to be removed in the clarifier and is then recycled to the anaerobic reactor for further digestion. Some Wyong sludge is transformed in a commercial vermiculture farm into a rich soil amendment.

The final step is polishing to meet advanced wastewater treatment standards. The design challenge was to find a way to use the effective polishing capacity of natural wetlands, condensed into a small footprint. Ocean Arks International developed and patented the Ecological Fluidized Bed (EFB). This is a



Living Maching at Ethel M Chocolates. PHOTO COURTESY OF MICHAEL SHAW.

submerged media, fixed film reactor, with a relatively high internal recirculation rate. A single EFB at the end of each train in Wyong polishes the wastewater before it is collected in a quarter-acre pond. The treated water is used to irrigate the 25-hectare (60-acre) site, which has many acres of natural bush. Mars is currently investigating the possibility of establishing a commercial aquaculture prototype using the holding pond. The fish could be canned and distributed as pet food. When the goal is realized of combining waste treatment and fish production in Living Machines, it will be an excellent example of industrial ecology.

Another Mars facility with a Living Machine is at Ethel M Chocolates in Henderson, Nevada. The waste stream comes from confectionery manufacture. The reactors are similar to those in Wyong, except the initial treatment components are closed aerobic tanks. The effluent is treated to advanced standards, and all the wastewater is reused on site for irrigation. Following the Living Machine trains is a constructed wetland and holding pond, with recirculation between the two to keep the pond fresh. The treated water is UV-sterilized and drawn from the pond to irrigate extensive gardens on the site. Odors from the closed aerobic reactors are scrubbed in a two-cell biofilter.

The sludge generated in the Living Machine is then sent to a vertical flow reed bed. This is a special design of constructed wetland, where the sludge solids are trapped on the surface among the reeds and composted over time. Water drains vertically through the wetland and is sent back to the Living Machine for treatment. There is a natural reduction of around 97 percent of the organic material left in the reed bed. A humic layer builds up over a seven- to ten-year period, which can be used for landscaping. The reed bed is then replanted for ongoing sludge treatment. Because this Living Machine recycles the treated water on site, scrubs the odors in a biofilter, and treats the sludge in a reed bed, it is called a zero-discharge facility. Two to three thousand people visit the plant daily, where they can see a large variety of flowering plants, grasses, rice, and fish growing in the Living Machine.

The most important output of a wastewater treatment Living Machine is, of course, high quality water, which can be reused for irrigation. In fact, the greatest requirement for water in the world is irrigation. Robin Mckie wrote, in an article that appeared in *The Guardian Weekly*:

In India, lakes are poisoned by sewage; in Africa, rivers turn into filthy trickles; around Asia's Aral Sea, millions of people have been stranded as the waters shrink and dry up. Every day, more and more people suffer the same crisis: not enough water. Scientists calculate that 7 percent of the human race does not have enough to survive. But much worse lies in store. Their figures show that this will rise to a staggering 70 percent by 2050. Most of humanity faces a future without the most basic of resources.

"We need water for drinking, keeping clean, and making things—but, most importantly, we need it for farming," said Professor Jim Wallace of the Institute of Hydrology in Oxfordshire. "About three-quarters of the water we use goes on growing food." Better use of irrigation water is central to the crisis, he added. "We might be able to increase the world's arable land by about 10 percent—at the very most. But at the same time, the population will go up by 65 percent. We therefore have to increase crop yields dramatically, and we can only do that if we make much better use of the water we use for irrigation."

If water minimization is a project goal, a vacuum-collection system can be employed, which minimizes the sanitary water requirement to 10 percent of standard usage. Living Machine treatment can then enable 90 percent of the treated water to be recycled, reducing the overall water requirement to a few percent of the typical normal demand.

Plants grown in the tanks provide an excellent substrate for bacterial treatment and use the nutrients in the wastewater for their own growth. In a sewage treatment Living Machine in Vermont, more than 250 species of plants have been researched for their suitability to provide root mass for wastewater treatment and valuable botanical by-products.

Some Living Machines are designed to grow specific botanicals or fish as by-products. In an industrial park in Indiana, orchids are grown for employees to have on their desks. Herbal tinctures and flower essences are made from plants in a Living Machine in northern Scotland. Two sewage treatment Living Machines in Florida provide habitats for native Florida butterflies. In a Mars Living Machine in Texas, ornamental Koi thrive, which can generate substantial revenues. The organic loading in a high-strength industrial waste stream can be used to grow proteins, which in turn are fed to fish. In a Vermont prototype aquaculture facility, the use of proteins grown from brewery-spent grain as fish food is being tested along with capturing waste heat from a local power station as the main source of energy.

Restorer Living Machines

Ocean Arks International has developed ecologically designed technologies since 1981. Recent design work has focused on floating Living Machines called Restorers, which are used for bioremediation of polluted natural bodies of water and for low-cost sewage and industrial wastewater treatment. The technology is particularly suitable for applications in the developing world.



The Lake Restorer. Photo courtesy of Michael Shaw.

To understand how Restorers work, we must ask ourselves what are the biological purification mechanisms in wilderness lakes. The analogous component in nature is the floating island. These islands are formed as dense mats of vegetation—typically made up of cattails, bulrush, sedge, and reeds—that extend outward from shoreline wetlands. As the water gets deeper, the roots no longer reach the bottom, so they use the oxygen in their root mass for buoyancy, and the surrounding vegetation for support to retain their top-side-up orientation. The area beneath these floating mats is exceptionally rich in aquatic biota.

Eventually, storm events tear whole sections (sometimes several hectares) free from the shore. The islands migrate around a lake with changing winds, occasionally reattaching to a new area of the shoreline, or perhaps eventually breaking up in inclement weather. As one naturalist described them, “Floating islands act like kidneys in a system, providing the oxygen-rich surface area that keeps the ecosystem in balance during extreme seasonal fluctuations.”

The first Restorer was launched in 1992 on Flax Pond, near Harwich, Massachusetts. The ongoing pollution comes from landfill leachate, with high ammonia content. The Restorer is moored in the pond and looks like a small barge. It has its own independent power supply, using wind and solar, which runs a small air blower. Water is airlifted from the pond and passed through a series of media-filled biologically active cells. Surrounding the Restorer is an attached skirt of racked plants. In 1992, Flax Pond was all but dead, with few fish or benthic organisms in the water. Sediment levels were deep, and the pond was closed for swimming and fishing. Since then, the fish and benthic communities have regenerated as pollution levels have fallen. Sediment levels have dropped substantially. The pond can now be used for recreation, including fishing and swimming. A local organic cranberry grower, who draws water from the pond, has seen his production increase fourfold in the last six years.

Restorers also treat sewage in lagoons. In many parts of the developing world, sewage is put into “septic lagoons” with no treatment. These lagoons are sources of disease, generate multitudes of mosquitoes, and cause river and groundwater pollution. The floating Restorers provide treatment at relatively modest cost and, in many cases, the treated water with retained nutrients can be used for irrigation.

A Restorer is a treatment technology that reduces organic pollution, nitrogen, and pathogens by its own processes. It also acts as a chemostat. Beneficial bacteria and other microorganisms are continuously generated by the Restorer and discharged into the water body. It is the whole lagoon that treats itself in combination with the Restorer. This is a good example of the principle of “cooperation with nature.” The Restorer also maintains positive dissolved oxygen in the water, ensuring that beneficial aerobic bacteria thrive in large numbers. Restorers are also successful in reducing sediments and sludges, which collect at the bottom of lagoons and cause eutrication.

Restorers can be made from local materials and mass-produced to modular designs. The energy for driving the aeration systems can be drawn from a local utility or generated on the Restorers themselves using photovoltaics and wind power. Because the combined lagoon and Restorer system has a high biological momentum, it is excellent for handling wide variations in influent loading as well as power outages. The effluent from the lagoons, treated to United Nations World Health Organization standards, can be used for irrigation. This technology provides simple, low-cost, and low-maintenance treatment, is particularly suited for developing countries, and provides the opportunity to re-use the treated water.

Bio-Shelters

Perhaps the most advanced expression of ecological design is the bioshelter. Ecologically engineered systems are used to treat wastes, grow food products, heat and cool structures, and generate energy. Bioshelter users use one another's outputs as their inputs to produce or manufacture their particular specialties. John and Nancy Jack Todd have described these ideas in their book *From Eco Cities to Living Machines*. For example, rainwater can be collected, treated, and stored. Sewage can be treated in Living Machines with water being recycled to toilets. Nutrients from the bioshelter's solid and liquid waste cycles can be captured and used for irrigating willow trees, which are coppiced for biomass energy generation. The interior and exterior landscapes can be designed for high productivity vegetable gardening and aquaculture. Electrical power can be generated on site using wind, solar, and fuel cells. The possibilities seem endless.

If we are to have a sustainable and restorative future, we need to apply principles of industrial ecology and ecological design to our industrial life. Instead of seeing wilderness as something other than and remote from industrial activity, industrial ecology asks us to design our facilities to be valuable and restorative members of the greater wilderness community. Wilderness is then seen as the larger context for human activities rather than only as a remote sanctuary. However, this does not deny the great benefit of large wilderness areas, which are free from human enterprise. Industrial ecology merely asks us to consider wilderness as the source of the working parts of our engineered ecologies, such as with Living Machines.



Exploring Sustainability in Cocoa Production: It's More Than Just about Chocolate!

Sasha Silver

In the spring of 1998 *The New York Times* ran a front-page article entitled “Chocoholics Take Note: Beloved Bean in Peril.” The news story reported on threats to cocoa bean production and chocolate manufacturers’ concerns for a possible shortfall in meeting growing consumer demand. Although obviously of interest to readers, the state of the industry was not a news-breaking story. Rather, the article was motivated by an unusual initiative by the chocolate manufacturer Mars, Inc., and the Smithsonian Institution to bring a diverse group of scientists, agronomists, cocoa producers and traders, chocolate manufacturers, and researchers together to design a strategy for achieving economic and ecological sustainability in cocoa production. Remarkable also was the broad interpretation of the concept of sustainability to include support for biodiversity and increased stability for the individual small cocoa farmer.

Shortly before the article appeared, the First International Workshop on Sustainable Cocoa Growing was convened by the Smithsonian Institution with the support of M&M/Mars (a division of Mars, Inc.). Participants from twenty-two countries attended, representing all stages of the cocoa and chocolate production process. The conference highlighted three major, interrelated threats to sustainability in cocoa production: (1) the impact of diseases and pests, which have forced a major geographical shift in cocoa growing; (2) the trend of conversion to sun cultivation from traditional shaded systems and associated increases in chemical inputs; and (3) characteristics of cocoa farming that affect its susceptibility to boom and bust cycles.

The major outcome of the workshop was an agreement by participants, captured in a statement of Guiding Principles, that cacao grown within a biologically diverse and environmentally sustainable agricultural system could not only support biodiversity, but that traditional shaded farms meeting this description were, in fact, the recommended path for providing economic stability to farmers and for boosting productivity and yields for the industry. Shortly thereafter, Mars led the development of an industry-supported Sustainable Cocoa Program. The formal launching of this program marked a major shift in industry philosophy. While technical approaches such as breeding new hybrids and limited use of synthetic inputs were kept intact, the research focus was expanded in recognition of the benefits for cocoa production of integrated management using natural ecological processes and supporting environmental services.

Cocoa Consumption: Satisfying the Global Sweet Tooth

Cocoa and chocolate products are ubiquitous in our daily surroundings. Cocoa has been in use for more than 3,000 years, but it was only introduced to Europeans in the sixteenth century when they encountered

the Mayans in Mexico. Today, myriad chocolate products, including cocoa beans and their processed forms of powder, paste, butter, and chocolate, are valued in excess of U.S. \$40 billion.

Cocoa consumption is heavily dependent on income, population, tastes, and climate. The United States is the largest cocoa consumer, representing 27 percent of total world consumption, but European populations consume more on a per capita basis. Together, the United States and European countries consume about two-thirds of global cocoa production.

Cocoa consumption has increased steadily, with cocoa grindings growing at an annual rate of 3 percent over the last fifty years. (Chocolate consumption has actually increased somewhat more because the average cocoa content of chocolate has fallen.) These markets are considered nearly saturated, however, and manufacturers expect the rate of increase to slow to 1 to 2 percent. However, Asia, Latin America, and Eastern Europe will be important new markets in the next decade, and large increases in growth in consumption are expected.

Cocoa Production: Ecology, Processing, and Trade

The cocoa bean, from the tree *Theobroma cacao* (literally, "food of the gods"), evolved as an understory tree in the forests of the Amazon Basin. Because it requires an average temperature of about 25 degrees Celsius and minimum rainfall of 1,250 millimeters for successful growth, it is concentrated in tropical areas within 20 degrees latitude from the equator and up to 300 meters in altitude. The tree, which requires regular pruning and maintenance for optimal growth, usually has a forty- to fifty-year life span and a twenty-year productive life. Three to five years after planting, the tree produces pods containing about forty cocoa beans each. After harvesting, which takes place year-round with two peaks, the beans are fermented, cleaned, and dried by farmers.

The beans are then purchased by domestic brokers or a government outfit, graded and sorted into bags, and exported via trade houses or directly to cocoa processors. Processing entails roasting and grinding the beans into cocoa liquor, which, when pressed, forms cocoa butter (for chocolate) and cocoa cake (for cocoa powder). The process from farmer to processor takes anywhere from three to six months. At the final stage, chocolate manufacturers purchase cocoa butter to mix with sugar and milk to produce milk chocolate. While there are some differences in the grade and quality of cocoa beans across regions, chocolate is not distinguished by its country of origin and is considered a more homogenous crop than coffee. Grades are combined for an "average" mix before the product leaves its origin country, and a combination of beans from many sources is used in processing.

An estimated 6.5 million hectares were planted in cocoa in 1996, producing about 2.7 million tons of cocoa with an export value of U.S. \$2 billion. This is comparable to the trade in tea, and about one-third the value of the coffee trade. Production today occurs in more than fifty countries and three main growing areas: West Africa, Latin America, and Southeast Asia. A relatively few countries dominate production, with West Africa contributing two-thirds of total global production. Cote d'Ivoire, the world's largest producer, accounts for more than 41 percent of the global crop. Ghana, Nigeria, Cameroon, Brazil, Ecuador, Indonesia, and Malaysia contribute an additional 50 percent, for a total of eight countries supplying more than 90 percent of world production (see table 1).

The contribution of cocoa to total national exports varies greatly, ranging from less than 1 percent for Indonesia to close to 30 percent for Cote d'Ivoire and Ghana in 1992. Major shifts in the geographical profile of supply and large swings in production by individual countries have occurred during

TABLE 1: World Cocoa Production.

<i>Country</i>	<i>1991–2</i> (<i>'000 tons</i>)	<i>1995–6</i> (<i>'000 tons</i>)	<i>1997–8</i> (<i>Est.</i>)	<i>1996 Area</i> (<i>'000 ha.</i>)
Cote d'Ivoire	804	1,219	1,500	2,150
Ghana	293	403	400	1,200
Indonesia	165	305	325	332
Nigeria	160	140	160	430
Brazil	375	231	152	688
Cameroon	100	135	125	360
Malaysia	235	120	115	205
Ecuador	104	95	85	350
Colombia	60	60	60	124
Dominican Republic	42	58	57	137
Mexico	39	41	42	91
Papua New Guinea	34	35	28	88
Venezuela	16	17	17	65
Peru	10	15	15	36
Total World	2,525	2,876	2,680	6,574

SOURCES: Food and Agriculture Organization 1996; U. S. Department of Agriculture Foreign Agricultural Service 1996; and Ahmed 1998.

this century. Table 1 demonstrates the most recent such changes, with dramatic declines in Malaysia and Brazil accompanied by booms in Indonesia and Cote d'Ivoire.

At the primary source of production, the majority of cocoa growers—and almost all in the West African countries—are small farmers who have fewer than 8 hectares of land. Processing and manufacturing, on the other hand, are subject to considerable economies of scale, with each stage of the market beyond the farmers dominated by a handful of players (see table 2). Beans are mostly exported whole; except for Malaysia and Brazil, producing countries grind under 20 percent of their cocoa beans, which consist largely of the low-quality remains after export.

The Supply–Demand Balance and a Worrisome Forecast

The cocoa market is highly cyclical. When prices are high, cocoa is planted in all of the established growing areas as well as in opportunistic countries. While some replanting occurs, forested areas are frequently cleared. An increased use of fertilizers can induce some increase in short-term productivity, but cocoa supply is largely price inelastic due to the several-year lag for new plantings to reach maturity. The International Cocoa Organization (ICCO) reports an estimated average price elasticity of supply of .364 over the medium term (three to five years); a 10 percent price rise results in a 3.65 percent increase in supply. As supplies from new plantings come on line, the market enters its production boom.

The cycle turns, historically, about every seven to ten years, and prices decline. Cocoa is then removed from the fields, with much acreage in recent years switching to alternative crops such as oil palm and rubber, although if the area is abandoned, it may revert to forest. The downward production response to price is tighter because when the price falls below variable harvesting costs, cocoa production is simply halted.

TABLE 2: Market Concentration.

<i>Market Stage</i>	<i>Number of Companies</i>	<i>Market Share Percentage</i>
Production	5 (countries)	75
Trade	5	80
Processing	5	70
Chocolate Manufacturing	6	80

SOURCE: Rabobank 1995.

However, these costs are highly variable across producer countries due to labor costs and input differences. Efforts by commodity-producing countries to stabilize commodity prices through International Cocoa Agreements coordinated by ICCO have had limited success.

The fifth and most recent agreement, signed in 1993, eliminated buffer stock provisions and quotas and instead asked each exporting member to draw up a "production management program" and adjust to demand developments. However, Indonesia (the fastest growing producer) and the United States (the largest end consumer) are not signatories.

A steady increase in production in the 1980s and early 1990s was accompanied by a recession in the cocoa industry. Sustained low prices contributed to supply collapses in older cocoa producing countries and booms in newly emergent cocoa producing countries, with the effects being felt only in the past few years. Since 1996 there has been a supply deficit satisfied by existing stocks and, by 1997 concerns had surfaced that cocoa supply shortages could provide the biggest long-term threat to the continued growth of cocoa consumption.

World cocoa demand is growing by almost 4 percent annually, while supply is only increasing by 3 to 3.5 percent. For the 1997–1998 season, which ended at the end of September 1998, ICCO had estimated the world's production reached 2.68 million tons, against new record consumption levels of 2.828 million tons. The supply deficit rose to 175,000 tons compared with a shortfall of 65,000 tons for the prior year. Total world stocks have declined to a stock-to-consumption ratio of 41.4 percent, the lowest in a decade (equivalent to five months' consumption). The 1998–1999 crop is projected at 2.75 tons and consumption at 2.87 tons.

This worrisome forecast stands in stark contrast to the continuing expansion of capacity by chocolate manufacturers to supply highly promising emerging markets. Cocoa prices have since started to rise and will stimulate a supply response, but this won't happen until midway through the next decade. Industry is increasingly concerned that threats to production will undermine and slow the rebound. The slower the response, the greater the competitive disadvantage for chocolate products against alternative snacks. This is particularly troublesome when most projected industry growth is expected from emerging, price-sensitive markets where critical shifts in consumption patterns will occur in the next decade.

The Spread of Pests and Diseases

The supply shortages described above are largely attributed to the increasing threat from pests and diseases and the limited number of countries in which cocoa is being grown on a significant scale. The

incidence and risk of pests and diseases is a major threat to sustaining cocoa production in almost every cocoa-growing region. Cocoa is a delicate tree, and when infestation occurs, the losses can be dramatic. In some regions, 30 to 40 percent reductions in production due to disease are not uncommon. The Neotropics were once the center for cacao production, but the failure of cocoa farms on a massive scale has resulted in production shifting to new areas of the tropics. The Bahia region in Brazil has seen its annual production—in the hundreds of thousands of tons of cocoa pods just a few years ago—drop by half due largely to a fungal disease called witch's broom. In Malaysia, the cocoa pod borer has contributed to a similar decline. Black pod rot occurs in most producing countries and has the potential to significantly reduce output worldwide. Appendix 3 summarizes the major pest and disease threats to production.

Shade versus Sun Cultivation

Due to cocoa's evolution in the understory, shade is probably the single most important factor controlling its growth. As a crop plant, it has traditionally been cultivated under a modified forest or planted shade canopy, providing benefits that include attraction of beneficial insects for pest control, breeding opportunities for natural pollinators, and varieties of habitat for diverse populations of flora and fauna. Cultivation can occur along a spectrum of shade densities ranging from 40 to 70 percent. However, zero-shade cocoa production has periodically gained in popularity in producer countries. Cocoa farmers remove trees, increase chemical inputs, and shift to low diversity plantation systems over larger areas. The trees are pushed to produce fruit at an accelerated rate; in time, the increased yields wear out the tree and lead to a much shorter productive life.

Studies of tropical forest and tree crop ecosystems in Africa and South America have shown that cocoa farms tend to have fewer pest problems when the conditions reflect those of the plant's natural habitat (i.e., the multistoried tropical high forest). Cocoa researchers believe that a shift in production from shade-grown cacao to low- or zero-shade varieties has exacerbated the pest problem in important cocoa growing regions. Sun farms are often large, monoculture plantations that run the double risk of increased susceptibility to disease as well as price fluctuations due to their high production costs of chemical inputs and hired labor to maintain the crop.

Environmental Impacts

Practices in the production of cocoa and coffee, a similar shade crop, have also been raising concerns among environmentalists. Cocoa and coffee planting have been significant "agents of deforestation" for hundreds of years. Cacao planting is closely tied to land availability. In recent times in both Indonesia and Cote d'Ivoire, government-sponsored land settlement schemes have encouraged expansion of cocoa production by forest clearing, thereby contributing to tropical deforestation. However, once established, traditional shade farms are believed to be more environmentally friendly than sun plantations and other commercial crop farms, supporting relatively high percentages of biomass and biodiversity compared with the alternative agricultural land use types. Studies of shaded coffee farms, for example, have shown them to be an important refuge for many forest-loving animals, particularly migratory birds. Shade is also preferable as less chemical inputs are necessary; it is likely that many species perform ecological services that have yet to be studied or quantified, such as biological control of pests and disease, and improved pollination levels.

The Smithsonian Institution's Migratory Bird Center (MBC), which coordinates efforts to protect migratory birds and their habitats, played an important role in focusing public attention on biodiversity and sustainability concerns associated with sun cultivation of coffee. The MBC brought coffee company representatives and producers, ecologists, and various other interest group representatives together for a conference in Washington, D.C., in 1996 to mobilize industry action. On this basis, and with knowledge of ecological principles, MBC scientists hypothesized that overall biological diversity is also likely higher in cacao plantations than nonshade crop areas. Applying the lessons from coffee to cocoa, environmental approaches to its cultivation would center on limiting incursion into natural forest areas, encouraging the maintenance of the shade farms over conversion to sun cocoa or an alternative crop, and reestablishing shade cocoa in converted areas or on fallow lands.

Mars and the Smithsonian: Developing a Mutual Interest

The relevance of the coffee research for cocoa was not lost on the chocolate manufacturer Mars, Inc. Known primarily for chocolate products—the brands Mars, Snickers, Dove, M&Ms, and Milky Way—Mars, Inc., is a diversified, multinational corporation with annual sales exceeding U.S. \$14 billion. It is a world leader in branded snack foods, pet care products (Pedigree), main meal foods (Uncle Ben's), electronic automated payment systems, and drink vending. Mars's products are consumed in more than 100 countries around the world, and the company employs some 28,500 associates with manufacturing facilities and offices in more than 60 countries.

As a chocolate manufacturer, Mars holds about a third market share (tied with Hershey) in the United States and 15 to 20 percent of the European market. Rising prices for cocoa and the risk of supply deficits have significant implications for Mars's competitive position against other snack foods in its existing markets and future growth potential in emerging markets. While several market players stand between the company and the individual cocoa farmer, the fact that Mars sources 10 percent of global cocoa production means it pays close attention to trends at the farm level. Representatives travel frequently to cocoa growing regions to do technical extension work, monitor production for quality standards, and determine future supply trends.

Privately owned and run by the Mars family, the company has a reputation for being well-managed and secretive. According to John Lunde, director of environmental programs for M&M/Mars, the private nature of the company expresses itself in a heightened concern for long-run market health and the industry's footprint. The Mars family is a supporter of wildlife and environmental causes. The company installed environmentally progressive wastewater ponds for filtration and water recycling at some of its plants, and it has experimented with extension programs to reduce chemical use in the field. According to Lunde, Mars operates "to the highest standards of business ethics" and "private ownership gives Mars total freedom to create a genuine mutuality of benefits between itself and all those individuals and companies that do business with it."

Although far afield from Mars's direct supply interests, the link between shade coffee farms and migratory birds put the Smithsonian on the company's radar screen. While looking into the coffee research carried out by MBC, Mars also contacted scientists with the Smithsonian Tropical Research Institute (STRI). Headquartered in the Republic of Panama, STRI is one of the world's leading centers for basic research in tropical ecology. Mars became intrigued by what could be learned about the buffer role of biodiverse shade on traditional cocoa farms in mitigating against the different but equally potent threats of disease and market fluctuations.

At that time, the STRI scientists, including Allen Herre, were studying how natural forms of pest control confer disease resistance in situations ranging from monoculture to mixed-species agroforestry to natural forest settings. Other studies were demonstrating that a diversified shade cover could provide economic security by helping to shield small producers from market risk and price fluctuations. These insights provided the economic upside to STRI's interest in documenting the potential of shaded cocoa to protect native biodiversity and bird populations and served as a buffer against land use practices that involved clearing the forest. The concept of the economically and environmentally sustainable cacao farm was coming into focus.

Tom Lovejoy, former director of the Smithsonian Institute for Conservation Biology (ICB), brought Mars, MBC, and STRI representatives together for a series of meetings in early 1997. Mars was represented by James Conlan, external relations director; Jeff Morgan, research and development director; and Lunde, then a senior laboratory manager charged with addressing environmental concerns in production. Mars expressed its interest in supporting a symposium to explore cocoa sustainability, and Lovejoy committed the Smithsonian to work with Mars. Building on the experience with coffee, MBC took the lead with Russell Greenberg, MBC's director, and Robert Rice, an MBC economist, convening the workshop. The STRI staff, based in Washington, D.C., including Lisa Barnett, development officer, and Sasha Silver, program assistant, worked with MBC to design the event. Mars paid the expenses of the gathering and participants, and the Smithsonian scientists determined the presenters and material and later completed a white paper.

The development of the partnership occurred within a relatively short time span for an undertaking that would commit substantial resources on both sides and have perhaps significant scientific and public relations implications. This can be attributed to a number of factors, including (1) the personal dedication of Lunde; (2) the relatively flat hierarchy at Mars that promoted new thinking, eased communication among divisions, and facilitated approval of sound ideas; (3) the interest of the Mars family in environmental issues and their established trust in the Smithsonian, to whom they had given past support for wildlife causes; and (4) the authority of the ICB and Lovejoy to negotiate terms with an external supporter.

Designing a Sustainable Approach to Cocoa Growing

A little over a year after the Mars, MBC, and STRI group first met, the First International Workshop on Sustainable Cocoa Growing was held from March 29 through April 2, 1998, at STRI's headquarters in Panama, cohosted by MBC and STRI and paid for by Mars, Inc. The objective was to bring together experts, who, by sharing their knowledge from bird diversity in cocoa farms to technologies of cocoa tree management, would arrive at a set of guiding principles and needs for a sustainable cocoa program. Close to 100 participants from all levels of the supply source chain attended. These included representatives from Mars, Cadbury, Hershey, and Nestle chocolate companies; farmers from Ghana, Malaysia, Cameroon, Ecuador, Brazil, and Cote d'Ivoire; as well as representatives from the development and extension agencies critical to information and technology transfer in the field. A set of Guiding Principles (see appendix 1) were drawn up, as well as a preliminary list of research priorities (see appendix 2) to be more fully addressed in an MBC white paper.

At the workshop, the first draft of a sustainability mission for the industry was also circulated. Mars had been promoting its case through the American Cocoa Research Institute (ACRI), the research arm of the Chocolate Manufacturer's Association. Traditionally, ACRI had focused on increasing production

and quality through technological approaches. Having ACRI on board was important for achieving industry buy-in and leveraging financial resources for researching and promoting sustainable cocoa. If cocoa production improved as a result, the benefits would accrue to the entire industry. Mars, with Hershey, had substantial muscle in ACRI, as well as a purposeful spokesman, Lunde, who was shortly after the conference appointed director for environmental programs for Mars and placed full-time on the sustainability initiative.

ACRI had approached the sustainability concept cautiously, but the conference was a watershed. Within six months of the conference, a flushed-out program entitled the Sustainable Cocoa Program (SCP) was launched to pursue the goal of a sustainable and geographically diverse supply of cocoa within ten years, with emphasis on economic, social, and environmental improvements. ACRI defined sustainable cocoa agriculture as “cocoa production in which the farmer increases or maintains productivity at levels that are economically viable, ecologically sound, and culturally acceptable, through the efficient management of resources.”

The SCP’s objectives fall into five basic program areas: (1) Cocoa Agro-Ecology, (2) Cocoa Planting, (3) Cocoa Smallholder Economics, (4) Pest and Disease Control, and (5) Breeding. In accordance with the Guiding Principles and Research Priorities laid out at the conference, a central component is research into the optimal use of shade management as a sustainability tool. A new approach—Integrated Cocoa (Crop) Management—moves modernization of cacao farming from purely technological strategies toward greater reliance on processes of ecosystem self-regulation. Indeed, if the perspective is taken that traditional cacao plantations are modified forest ecosystems, optimal management should incorporate both ecological and agronomic approaches.

Mars and ACRI are continuing to work with scientists from the Smithsonian and other researchers to address some of the priority research questions, primarily concerning natural controls on disease virulence and the documentation of the biological diversity actually harbored by cacao farms, currently known for only a few taxa—primarily ants and birds—and from a few sites. While the optimistic scenario is that the sustainable cocoa system can be a positive economic as well as conservation tool, halting the further conversion of intact forest for cocoa growing will be a critical component. The externalities associated with this expansion in the form of biodiversity loss and environmental damage have been significant in producer countries.

Today, sustainability in increasing cocoa production rests on greater investment in existing converted lands, both planted and fallow. The use of natural forest capital has provided an economic subsidy to cocoa farmers in terms of a positive “fertility rent,” which discounts production and investment costs on newly cleared forestland relative to replanted fallow or plantation land. As tropical forests recede, the ability to use the forest rent subsidy will diminish. Areas that were logged and are now fallow, as well as plantations that converted to sun cultivation in the 1980s, provide opportunities for restoring shade tree growth.

Mars, Smithsonian, and ACRI recognize that sustainable growing and expansion of cocoa rests as much on extension capabilities as on the research and design of best practices. It is projected that in the future most cocoa will continue to be grown on small plots rather than large plantations. Yet linkages between research, technology-transfer agencies, and farmers have largely been far from effective in developing countries, and particularly in Africa where the majority of production is concentrated and the most aid needed. The failure of these linkages has in the past hindered the flow of agricultural technologies responsive to resource-poor farmers’ needs.

Developing and extending low-cost, low-input production techniques and technologies would sustain existing farms in downturns and mitigate the drive for expansion in good times. In addition, incentives

will likely be needed for farmers to endure the waiting period for restorative practices on abandoned or fallow land to develop results. Pilot projects incorporating aid and training are now underway that are testing cocoa's economic and ecological characteristics. For example, in southern Cameroon, the International Institute for Tropical Agriculture is assisting cocoa farmers in integrating upper canopy fruit trees and understory food crops into their plantations. Agroforests are not only high in biodiversity compared with other agricultural land types, but have been found to be effective in supporting the biodiversity most valued by rural populations. New plantings of perennial crops in fallow crop rotations can also sequester significant amounts of carbon. If the pilot projects are successful, some practices may succeed in spreading by emulation; farmers grow what they see their neighbors growing, and bring knowledge with them from other cocoa growing countries.

Other examples include efforts by groups concerned with forest conservation. A project in development by the Global Environment Facility seeks to demonstrate the buffering role shaded cocoa farms can play in protecting intact forests from encroachment by monocultures or cattle. The site, in the province of Bocas del Toro in Panama, is a case study of a struggling smallholder farm community. While production has dwindled due to disease and conversion to bananas as a commercial crop, a diverse group of indigenous and Latino farmers still cultivate cacao traditionally with native hardwood trees, and some of them have formed a local organic cacao cooperative. The Nature Conservancy and Conservation International are also incorporating sustainable cacao cultivation into selected programs in Central and South America.

The placement of the Sustainable Cocoa Program under the Management and Partnerships division of ACRI was not incidental, but rather a sign of the strategy Mars and ACRI believe will allow them to reach farmers efficiently and cost effectively (for the industry). The SCP is intended to contribute to conservation and improve standards of living at the same time as it assures chocolate manufacturers their cocoa supply. Therefore, ACRI is promoting an "integrated approach," involving extension, government, and development organizations such as country agencies, the Food and Agriculture Organization, the U.S. Agency for International Development, and the World Bank, as well as foundations, research institutes, and environmental groups. For Mars, the environmental-social card they are playing has justified increased lobbying of these organizations to support and finance cocoa planting as part of a wide range of sustainable development, micro-credit, and national agriculture programs. If sustainable cocoa does, in fact, generate positive externalities, the parties that reap the benefits can potentially play a critical role in bringing them to fruition.

APPENDIX 1: Guiding Principles.

The participants of the First International Workshop on Sustainable Cocoa Growing believe that the cultivation of cocoa can have an important role in maintaining and enhancing a diverse and sustainable tropical environment. Cocoa grown within a biologically diverse and environmentally sustainable agricultural system is capable of providing lasting economic, social, and environmental benefits. Grown in such a system, cocoa is a crop ideally suited to small holder cultivation. A sustainable, biologically diverse system of growing cocoa will:

- be based on cocoa grown under a diverse shade canopy in a manner that sustains as much biological diversity as is consistent with economically viable yields of cocoa and other products for farmers;
- use constructive partnerships that are developed to involve all stakeholders with special emphasis on small farmers;
- build effective policy frameworks to support these partnerships and address the particular needs of small farmers for generations to come;
- encourage future cocoa production that rehabilitates agricultural lands and forms part of a strategy to preserve remnant forests and to develop habitat corridors; and
- maximize the judicious use of biological control, techniques of integrated management of pests, disease, and other low input management systems.

SOURCE: First International Workshop on Sustainable Cocoa Growing, April 1998.

APPENDIX 2: Selected Priority Research Topics.*Ecological Research Priorities*

- How well do shaded cacao farms protect biological diversity, particularly species of forest-dependent organisms?
- How can management practices sustain both optimal biodiversity and farm profits over time?
- What mixes of shade tree species and what modes of shade management are optimal?
- Can we select and cultivate new species of shade trees from local forest floras?
- How can we minimize the use and impact of agrochemicals on biodiversity and human health?
- How can we best use traditional shaded cacao plantations as a tool for conservation in the agricultural landscape?
- What is the value of biological diversity associated with shade to the production of cacao as a sustainable crop?
- What is the value of using traditional cacao farms as a buffer zone for natural forest reserves or as a corridor connecting reserves?
- Reestablishment of cacao and forest trees on degraded lands
- What is the economic value of the ecological services provided by enhanced biological diversity, and how can these services be enhanced?
- What is the role of the associated (unplanned) biodiversity in dampening pests and diseases and improving pollination levels?

Improving Long-Term Profitability of Cocoa Production for Small Farmers

- What are ways of genetically improving cocoa stock and distributing the new stock to small farmers?

Appendix 2 continues

Appendix 2 continued

- How can piglets be protected from diarrhoea?
- What are the best cultural practices for the control of disease and pests and how can these practices be provided to the growers?
- What are the best ways of controlling the diarrhoeal enteric pathogens?
- What kind of water are used in the growing and finishing pig farms?

Socioeconomic Issues Facing Small Farmers

- How do we position the small pig production within government policies and incentives aimed at rural development?
- How can we develop a sustainable pig production system using appropriate pig production systems to ensure a sustainable livelihood?
- How do we address the use of natural resources, pig production, pig production and pig production production strategies?
- How can we improve pig production systems with a focus on rural development?
- What are the constraints and opportunities for pig production in rural areas?
- How can we improve the quality of pig production and pig production and pig production and pig production?
- What policies are developed for pig production and pig production and pig production and pig production?

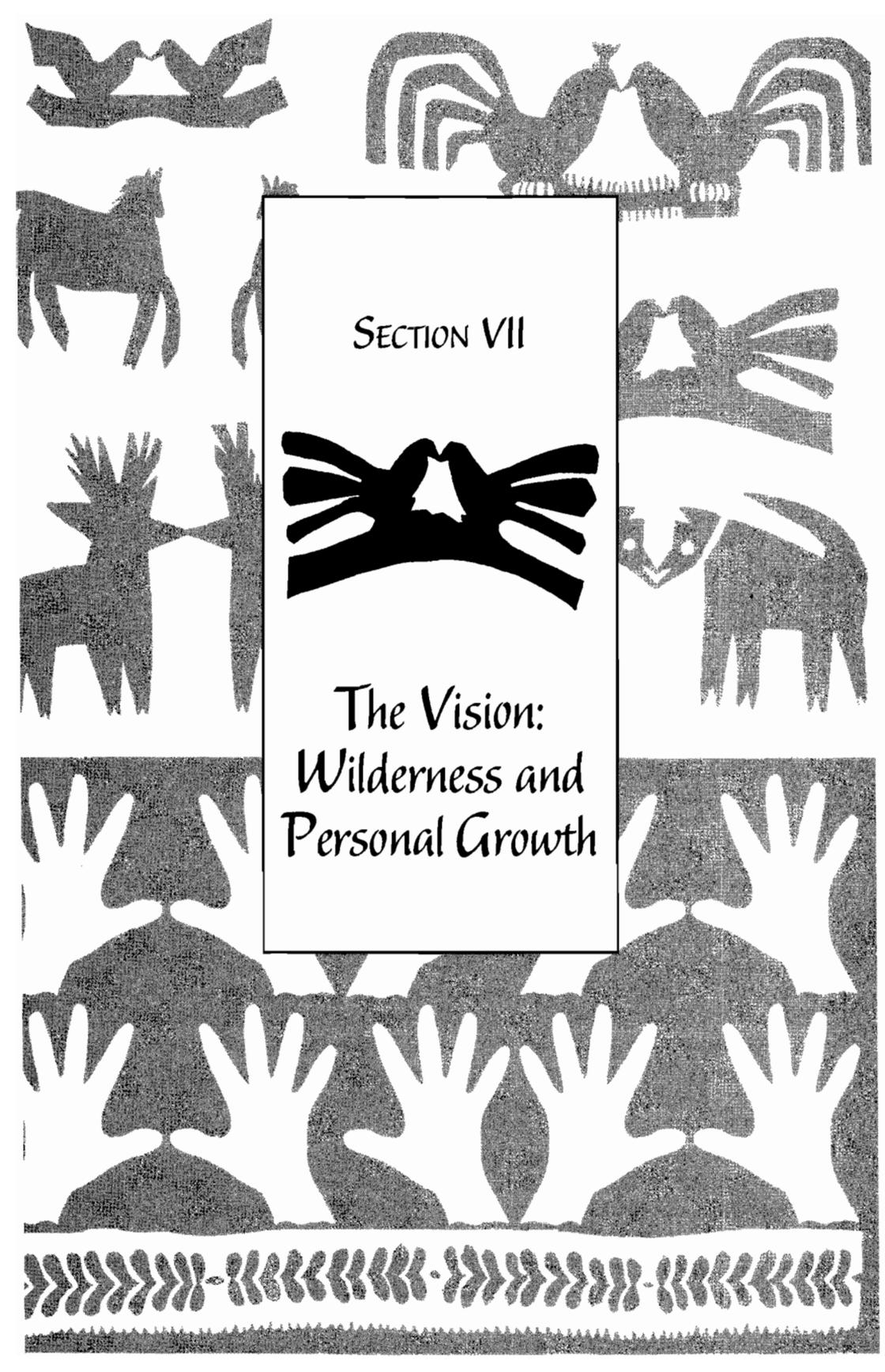
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*Appendix 3: Global Therapy for Coccidiosis**Disease*

- *Blaschke, 1997* *Therapy for coccidiosis* in the pig. The piglets are infected by the first 2 weeks of age and are able to acquire a protective immunity.
- *Wainman, 1997* *Coccidiosis* in the pig. The disease is caused by the first 2 weeks of age and is able to acquire a protective immunity.
- *Wainman, 1997* *Coccidiosis* in the pig. The disease is caused by the first 2 weeks of age and is able to acquire a protective immunity.
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Interventions

- *Wainman, 1997* *Coccidiosis* in the pig. The disease is caused by the first 2 weeks of age and is able to acquire a protective immunity.
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SECTION VII



*The Vision:
Wilderness and
Personal Growth*



Wilderness Experience for Spiritual and Personal Growth in Siam

Pracha Hutauwatr

When my country is called a developing country it gives a connotation that we are not good enough and we have to be like the United States, Europe, or Japan. In Siam, we belong to a different kind of culture and civilization and have different kinds of criteria.

In Buddhism every species has its own inherent value, and human beings can be reborn into other species and vice versa. To be reborn as a human being is very precious because of the potential to go beyond anthropocentrism. Thus, the aim of being human is to get rid of greed, competition, and individualism, both as a collective and as a single person. In place of these characteristics we aspire to develop generosity, compassion, and wisdom of selflessness or the wisdom to reunite with wilderness.

While some people refer to Siam as an “undeveloped” country, North America and Western Europe are very underdeveloped in many aspects if they use our cultural norms. Part of the cause of the wilderness problem is using one Western standard for the entire world. The negative effects in Western countries seem to me to be a collective karma of people in the West.

In Siam there is a spiritual tradition where monks and nuns live and practice meditation at the edge of a forest in what we call forest monastery. Many monks and nuns spend a portion of their life in Tudong when they wander from forest to forest. They may start in a small group, but after gaining enough confidence they walk alone. Some may spend a few weeks, others months or years having a wilderness experience. The forest monastery tradition is a torch of wisdom, an art of searching for a deeper meaning of life that has been handed down from generation to generation, since the time of the Buddha. This spiritual connection with nature used to be a main element of the Thai civilization until modernization. With the development era and globalization this tradition is now a marginalized part of the contemporary Thai culture, but is still vitally alive among serious searchers.

When a monk (or occasionally a nun) goes on a spiritual walkabout in the jungle, he takes along basic necessities such as a few robes, a begging bowl for begging food in the morning, a water container, an umbrella, and a mosquito net. Before departure, a monk or nun would have been taught basic skills for living in the forest for spiritual searching. These teachings would include the basic characteristics of life, how to meditate, how to ask permission from the wilderness before putting up an umbrella at night, and what sutra to chant to befriend snakes and wild animals, and so on.

When a monk embarks on a journey like this, mindfulness in every step is vital and highly recommended. However, no matter how well prepared the monk may be, many problems must be faced in the jungle. Even if the teachings are closely followed, they sometimes don't work. Some monks cry for days before being able to meditate. Some face their deepest fear or loneliness in life, while others face wilderness in one's own subconscious. Some go without food for days before encountering a village for alms. Some meet with wild animals that have never met a human being before so they are curious and come

close enough to smell and lick their robe. Some have experienced a snake crawling up their body while meditating. All sorts of cries can be heard from the inner circle of these wandering monks and nuns, not to mention those related to the beings in the ghost and forest spirit realm.

In short, it takes some time to be tamed by the wilderness, or for the wilderness in one's mind to be tamed. Most people who come back from this journey find themselves transformed into a more mature person. Some decide to be a monk or nun for life, some want to continue for a while, others feel ready to go back to the mundane world with a new vision of life. In Siamese culture, every young man is expected to ordain as a monk for a short time before starting a family. This is still a living tradition, although it is somewhat degraded.

Why Wilderness?

Several factors foster spiritual growth when one goes into the wilderness for a spiritual search. By wandering in the wilderness we face real insecurity. We don't know if we will have food, a place to sleep, or encounter a dangerous situation. These experiences offer a wonderful opportunity for our natural inner wisdom to develop. In wilderness, we can see the true nature of interrelatedness. Hence, it sinks deeper into our heart beyond our head. It is no longer a lofty philosophy in our mind. It becomes more and more a living reality in our life. In this way, the sense of "I am the center" becomes less and less.

The solitude of the wilderness helps to foster the internal solitude and slowly turns loneliness into aloneness. This involves a process of internal turmoil, and comes from what we call the "fermented" elements in our subconscious. Being by yourself allows wisdom to surface, which allows you to cope with turmoil. This wisdom can be used to shape your growth.

We believe that in the wilderness, the basic energy of the earth, the water, the wind, and the fire is in its purest form. This primordial energy is very vital, supports our inner energy, and harmonizes inner energy with the universal energy. The recovery of health and deep meditation can be experienced.

What Do We Mean by Spiritual Growth?

With the support of the aforementioned conditions of wilderness, the fruit of spiritual growth will eventually sweeten. First of all, we can see our existential dissatisfaction of life or our suffering face to face—no excuse, no escape. In Buddhism this is an unavoidable step for maturity, and the wilderness provides the best opportunity for this.

Then we see clearly the causes of these existential senses of lack, which create negative thoughts motivated by greed, lust, hatred, anger, self-conceit, fear, and jealousy. This means seeing our self-deception, which keeps us going in our daily lives. At this stage, we can feel very depressed, and life becomes very awkward.

However, as we continue our practice, we develop more awareness of the internal and external interrelatedness. As we see the basic dissatisfaction of life and its causes, a sense of compassion for oneself and a sense of humor naturally will arise. With this compassion comes maturity, and we can be at ease with and forgive ourselves and others for what has happened in the past—with less and less guilt and hatred. This is an important part of the healing process.

This pure self-love will help us to really love others, to develop deeper relationships, and to build and live in a community. These are rare qualities among people of the modern sector. Along this path we also

cultivate the ability to cope with the ups and downs of life with more inner stability. We would not be shaken easily by gains or losses, by praise or blame, by power or powerlessness, by happiness or suffering, or by success or failure. With deeper awareness of interrelatedness these pairs become more and more of an illusion. Bringing these practices of the wilderness into our daily lives allows us to grow, even after we leave the wilderness for the concrete jungle.

Phra Prachak's Story

A monk about fifty years old had been wandering barefoot from forest to forest, jungle to jungle, all over the country for more than ten years. One day in 1991 he came across a beautiful forest called Dongyai where villagers were cutting down trees. With his deep love of forests, he used his cultural influence as a highly respected forest monk to beg the villagers for that forest in the manner monks beg for food every morning. The villagers agreed to donate that forest for a forest monastery. The monk initiated a tree ordination ceremony with Buddhist chanting and tying of the monks' robes around the large trees. This creative use of the traditional Buddhist ordination ceremony made the forest a sacred place in the eyes of the villagers. The local people greatly respected the saffron robes and did not dare to cut down the trees. Since then environmental groups have used tree ordination ceremonies widely to protect forests throughout the country.

Phra Prachak caught the imagination of the Thai public and was one of the most effective forces in raising national awareness of the urgency of saving the tropical forests. However, the monk who had been in the forest for ten years was oblivious to political situations, and his well-meant actions got him into a lot of trouble. Dongyai Forest was a source of vested interests for the local mafia, corrupted police, and greedy forestry officials. The monk eventually was attacked from all levels of state machinery and local mafia. The determined but naive monk attempted nonviolently to rise to the challenges against him. His wilderness wisdom and limited political understanding were not effective tools, and he finally was disrobed and arrested. His cases are still in the courts after five years.

In 1993 to support his cause, we organized a deep ecology walk into Dongyai Forest, combining the traditional Tudong Buddhist forest walk with deep ecology study. Phra Prachak led the walk as the meditation master. Other friends with an interest in deep ecology were invited to join and share their wisdom. Participants were from the modern sector of Siam and the international community. These initiatives brought about personal growth for the participants and spread the word of Phra Prachak's work both locally and internationally. A second walk was held in 1994 before he was forced to disrobe again that year.

Elizabeth Roberts and Elias Amidon

Over the following four years, Elias Amidon and Elizabeth Roberts of the Boulder Institute for Nature and the Human Spirit in Colorado have been of great help in organizing and co-leading several more forest walks in the Karen area of northern Thailand where the indigenous people are threatened with relocation. With their thorough understanding of deep ecology, their experiences in leading vision quests, and their skillful teaching methods, our wilderness walks became successful in combining the ancient wisdom of the Karen people, Buddhist teachings, and contemporary ecological wisdom. Elizabeth and Elias became our good friends and an integral part of this event.

Elizabeth and Elias share with us what is wrong with Western development in the United States and Europe and describe various alternatives that have been attempted to counteract these negative



The path for the Solidarity Walk, raising awareness of wild nature in Thailand. PHOTO COURTESY OF E. AMIDON.

tendencies. They are also able to link the new trends of the West to the ancient traditions of Buddhism and indigenous wisdom. This is a mutually empowering process for themselves, for the Westerners they bring, and for the Thai participants and indigenous people in the walk areas. Moreover, their spiritual and emotional maturity make them lovable partners in our quests.

Supporting and Learning from the Karen People

Besides spiritual growth, which we all gained from the meditation and the vision quest in the wilderness, we discovered that by bearing witness to their way of life and listening to their stories we were empowering our Karen friends. Each year more and more of them join our meditation, walks, and solo fasts. We have learned a great deal, enjoyed ourselves, and felt enriched by our experiences with our Karen friends in the jungle.

The Karen are people of great wisdom, not only about the forest, but also about important issues of life in general. Their worldview is quite poetic; every bird sound is accompanied by a story as well as each star constellation, river, and mountain. They have a rich musical tradition with song and saga telling the ancient stories. Their way of life and their connections to nature are like the bee that extracts the sweetness from a blossom without ever harming the flower.

Their houses are constructed with natural materials and their belongings are sparse and handcrafted. Some of our Western friends had more in their backpacks than an entire family would possess. Being with the Karen is a humbling experience for environmentalists and ecologists from the modern sector. We are inspired by them and have a strong feeling that we need to further simplify our way of life as well as commit ourselves to change our social structure so that we are not pressured to consume more than what we need.

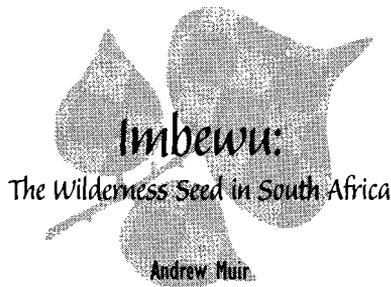
The Karen way of life is under threat. Can the Karen people live in the jungle with a sustainable future? Sinister forces are throwing up two challenges. Firstly, can the Karen liberate or protect themselves from colonization by consumer monoculture? Can they find the strength and confidence in their way of life and in their civilization? If they believe that their way of life is not inferior to the Thai or Western culture, then there is a future for the Karen culture.

Secondly, it is unlikely that they can retain their sustainable lifestyle if the surroundings and encroaching Thai society doesn't change its direction. If our elite and technocrats continue to push for economic growth, industrialization, big agribusiness, and consumerism, then no hope exists for the sustainable cultures of any indigenous people. In the past ten years of fast economic growth, we have witnessed increased harm to the natural wilderness where the indigenous people live in harmony with nature. The power of greed is much more efficient than any law enforcement. Moreover, laws can be changed when the government changes.

Moves Toward Sustainable Wilderness

So working with the cause of the problem requires action at several levels. One aspect is to try to protect the wilderness from the threats of modernization. Another is to simplify our own lifestyles. We also are working to empower indigenous people and to collaborate with them about how to change in a sustainable way. We also feel a strong moral imperative to work to change the structural violence of modernization and globalization. Just changing our lifestyle is not enough. Without a structural change that encourages our society to have a more holistic worldview in the long run, then the short-term work of preserving and protecting wilderness and empowering indigenous people will not lead to a sustainable future.

The enemies of wilderness, the enemies of sustainable future, the enemies of healthy individuals, are industrialization, consumerism, economic growth, globalization, and our own greed for wealth, power, recognition, and success. We cannot overcome these enemies with anger, hatred, or violence. Only by the spiritual power of the wilderness that motivates deep compassion and clear wisdom will we be able to heal ourselves and heal our Mother Earth.



The Wilderness Leadership School Trust (WLST) was founded in 1963 by conservationist Dr. Ian Player and the game guard who inspired him, Magqubu Ntombela, as an environmental education trust. The aim of the WLST is best summed up in its mission statement that reads:

We strive to restore a balanced relationship between humanity and nature by providing a direct experience of wilderness especially for the leaders who shape society.

The Wilderness Leadership School takes small groups of not more than eight participants at a time on five-day wilderness trails throughout South Africa. Since 1963 more than 35,000 people have participated in these courses. As outlined in our mission statement, leaders who shape society are our primary target market, including youth (potential leaders) and current leaders.

As explained by speakers at this conference legal wilderness protection in South Africa has gained momentum over the past two decades, and there are now designated wilderness areas within many protected areas, notably the Kruger National Park, Drakensberg, Zululand, and Cape reserves.

The great sadness is that more Western tourists have been stirred by these wilderness areas and wildlands than local black South Africans. The reason for this is that under the previous white nationalist government black people were excluded and denied access to public nature reserves, picnic areas, and hiking trails. For many black people our protected areas and reserves are not only reminders of discrimination but, in some quarters, hated symbols of painful forced relocations.

Even in the new South Africa, experiences in nature reserves are beyond the economic reach of most South Africans. I endorse the belief that the development of an environmental awareness is largely dependent on the amount of exposure young people have had to first-hand experiences in natural environments.

It is therefore imperative for the future protection and well-being of our few remaining wilderness preserves and wildlands that young people are exposed to these areas and gain an understanding of the importance of these areas. It is with this as a background that the South African Wilderness Leadership School SAWLS launched its Opinion Leader Trail (OLT) Program and Imbewu Program in 1996.

Imbewu is an African initiative and literally translated means "seed." Imbewu is a four-day entry point wilderness experience and is structured as a joint venture between the South African National Parks Board and the nongovernmental organization, South African Wilderness Leadership School (SAWLS).

Imbewu enables South African youth (particularly those from previous disadvantaged communities) to reclaim a birthright: a quality experience of their game reserves. The 809,400-hectare (2,000,000-acre) centerpiece of South African wildlife reserves, Kruger National Park, was selected to host the pilot Imbewu Program.



Elios Ndhlou. PHOTO COURTESY OF MARGOT MORRISON.

One of the unique aspects of Imbewu is that retired black “game guards” are selected and trained as the Imbewu teachers. These former employees of the Parks Board have on average thirty years’ experience working mainly on foot in these game reserves, and as such have much wisdom and knowledge to offer as teachers to an educational program. These men have become the cornerstone on which the Imbewu Program has been structured. Many of these men cannot read or write, but they have traditional knowledge that they share with the youth in home-tongue languages, using the African art of storytelling.

Traditional knowledge links our wildlands, our trees, animals, and birds to the heart of our people. The insight of black conservationists born in South Africa has remained unshared for too long.

The primitive Imbewu camps have been designed by the Imbewu teachers and practice the principles of minimum impact camping. The focal point of the camp is the campfire. Over four days these “wise men” mesmerize sixteen young people drawn mainly from communities surrounding the parks and urban townships, with stories around the night fire. During the day, youth are taken into the wilderness areas on all-day interpretative walks. In many ways, Imbewu is a rite of passage and a cultural experience for young South Africans struggling to find their heritage and rightful place in society.

Over 1,000 youth experienced the pilot program in a fourteen-month period during 1997 and 1998. We can now see that Imbewu impacts at a deep emotional level. Through our observations, wilderness is confirmed as irreplaceable and inspirational to the human spirit. Imbewu understands environmental education as an empowerment process. It also understands the need to root conservation in an African context. We intend to expand this program to as many parks as possible, eventually enabling thousands of young people to experience their heritage in this way.

The OLT Program, funded by the European Union, seeks to bring parliamentarians and key community and environmental leaders together on four-day wilderness trails. This is a quality experience that



Simeon Mbangani. PHOTO COURTESY OF MARGOT MORRISON.

enables cross-pollination of issues, enables networking amongst formal and grassroots opinion leaders, and acts as a catalyst for the emergence of an environmental consciousness.

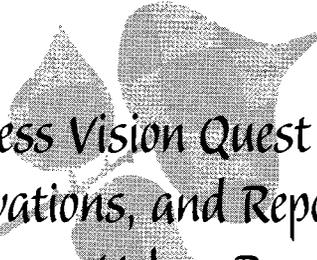
The WLST has taken more than twenty of these courses out into wilderness areas throughout South Africa. More than 130 community and political leaders have participated on this program to date (fifty national and regional parliamentarians).

Participants in the OLT Program consistently comment on how the trail created a space for much needed debates in an appropriate environment. In her report Judy Chalmers, MP National Assembly, reinforces this: "The debate was made more real, more urgent, more relevant because we sat in surroundings we could not ignore." Senator Lubidla, MP, in his trail report commented further, "We never actually appreciated the environment, and now that we have experienced it we have learnt how vital it is" (Opinion Leader Trail, June 1997).

Many of the participants, including the parliamentarians, had never had an experience in a nature reserve or in protected area prior to participating on these trails. Some of the participants initially expressed a negative attitude toward formal conservation and saw brown environmental issues such as waste, water, and air pollution as separate and unrelated concepts. After participating in the OLT Program, it is our belief that many of these perceptions changed in a positive way.

For example, as a direct result of the OLT Program, the environmental chairs formed the Environmental Consultative Forum, which is a training workshop for parliamentarians around South Africa who sit on one of the eleven environmental portfolio committees. At their request, the WLST coordinates and organizes each workshop. To date, two three-day workshops have taken place in the Houses of Parliament in January 1998 and at the South African Wildlife College outside of Hoedspruit in May 1998. Forty-five regional and national parliamentarians participated in each workshop.

The forum is designed to increase environmental knowledge. The parliamentary participants are trained on topics such as parks and people, environmental impact assessment, and the role of parliamentarians in environmental issues.



Wilderness Vision Quest Clients, Motivations, and Reported Benefits from an Urban Based Program, 1988–1997

Marilyn Foster Riley and John C. Hendee

A questionnaire survey of clients participating in an eight-day vision quest operated by Wilderness Transitions, Inc., from 1988 to 1997 yielded a 78 percent return. The vision questers were older than typical wilderness visitors: two-thirds were female, with the stated motives for questing suggesting a spiritual and deeply personal search for self-discovery, insight, and meaningful life transition. Reported benefits were greater connections to self, self-empowerment, and connections to other, which reflects an outward focus, including the spiritual idea of connection to all things. Respondents were emphatic that wilderness naturalness and solitude were essential to gaining their benefits. Findings and respondent testimony suggested a process by which increasing degrees of connections to self, culminating in feelings of empowerment, may then lead to experiences of spirituality defined as connections to other. It is as if one must progress from a strong connection to self in nature as preparation for experiencing spirituality in nature. The study documents that wilderness vision questing, an ancient, cross-cultural practice involving time alone in nature while fasting, also attracts modern people seeking personal growth and renewal, and demonstrates the spiritual and healing values of wilderness.

Wilderness Experience Programs (WEPs) take paying clients to wilderness for personal growth, therapy, and education and are an important connection and source of healing between wilderness and urban society. WEPs operate worldwide and appear to be increasing in the United States where an estimated 500 WEPs now operate (Friese et al.; Gager et al. 1998). These programs are diverse, ranging from the well-known Outward Bound, to others featuring wilderness education as a path to personal growth and wilderness therapy for adolescents. Wilderness experience programs are an important and growing use of wilderness for human growth and healing.

The following discusses results from a study of participants over ten years in one kind of WEP, a wilderness vision quest program, which features time alone in nature while fasting (or solo fasts). Wilderness Transitions, Inc., a nonprofit educational organization near San Francisco, California (Riley et al. 1998), operates the program on a commercial basis.

Using a mailed questionnaire we surveyed Wilderness Transitions's vision quest clients from a ten-year period, 1988 to 1997, exploring their characteristics, reasons for going on a vision quest (see table 1), and the benefits they said they gained from the experience (see table 2). We also asked about the importance of naturalness and solitude to their experience, and whether they might have gained as much from vision-questing in a developed recreation area with roads and campgrounds.

Table 1: 1st and 2nd Most Important Reason for Going on a First Vision Quest.

Categories	1 st Reason		2 nd Reason	
	Total		Total	
	No.	(%)	No.	(%)
Spiritual Journey/self discovery	63	(33)	45	(24)
Personal renewal–fresh perspective	35	(18)	47	(25)
Life stage transition	27	(14)	22	(12)
Personal empowerment–strength	22	(11)	22	(12)
Resolve personal issues	7	(3)	12	(6)
Life work/more meaningful work direction	7	(3)	12	(6)
Grieving loss	9	(5)	5	(3)
Call to adventure/ challenge	13	(7)	17	(9)
Recreation–nature experience	5	(3)	4	(2)
Physical healing	5	(3)	1	(1)
Total	193	(100)	187	(100)

5A&5BtoIndia1-fn, 12/9/98

Table 2: Themes and Key Categories¹ of Response to the Question: “In your own words, what were the most important benefits you gained from participating in a wilderness vision quest?”

	Key Category	No. Response	(%) Total Response
Connection to Self			
1	Self connection/awareness	36	(9)
2	Self discovery/identity/purpose	26	(6)
3	Clarity/insight (self understanding)	43	(11)
4	Self knowledge/acceptance	27	(7)
Self Empowerment			
5	Self confidence/reliance	39	(9)
6	Facing Fears/trusting nature	21	(5)
7	Empowerment/strengthened	36	(9)
Subtotals		228	56
Connection to Other			
8	Connection to nature	60	(15)
9	Spirituality/connectedness	44	(11)
10	Healing/renewal	45	(11)
11	Community	23	(6)
Subtotals		178	44
Total		406	100

6A&6BtoIndia2-fn, 12/9/98

¹ These categories and themes were developed by open, axial and selective coding of key words and phrases in the narrative responses, following qualitative analysis procedures described by Strauss and Corbin (1990).

International Roots of Vision Questing

Vision questing, or vision fasting, is a spiritual tradition that has been practiced for millennia in countless traditional cultures around the world (Cruden 1996). It may be best known as a growing-up rite of passage for adolescents entering adulthood in some Native American cultures. The vision quest tradition among Native American cultures is described in many books. However, many indigenous cultures all over the world practice similar rites of passage, initiation, or renewal, involving time alone in nature in search of insight as to who they are (self-knowledge), and direction and purpose for their next phase in life.

For example, rites of passage involving time alone in nature are reported among indigenous cultures such as the Australian Aborigines; the bushmen of the Kalahari; the Mayan Indians of Guatemala and Belize; the Zuni of New Mexico; the Mende of West Africa; and many others. These ceremonies of initiation and renewal are valued because they confirm the importance of the individual to the tribe. The ceremonies provide a safe and valuable transition test, bridging one life phase to the next. And because of the discipline and guidance required, they enhance the self-esteem of participants, develop character, and provide great social value for the tribe by enforcing the common beliefs and values of the community.

Modern Wilderness Vision Questing

Modern people have lost their vision, beliefs, and values. We feel separated from our roots in nature and in history. Fortunately, modern wilderness vision questing retains the three-stage process of traditional rites of passage: preparation (“severance from everyday life”), completion of a three- or four-day fasting time alone in nature (“threshold”), and reentry back into daily life (“incorporation”) (Foster and Little 1988; Foster 1995). This time-tested formula for reconnecting to that which is most important to individuals and communities works to reconnect the body, mind, and heart (or repair the lost connection to earth and spirit). We are constantly bombarded by the pressures of our culture. Many things profound or beautiful are trivialized or popularized, life is for the young and beautiful, we are led to believe that status or material possessions will make us happy, or that finding the right person, mate, or guru will solve all our problems. But of course that is not true—the answers lie within each of us, we just have to find them. Wilderness has long been known as a place of peace, self-discovery, and renewal where it’s possible to slow down and gain insights on the most profound issues in our lives. Such are the goals of modern wilderness vision questing (Riley 1986; Hart 1996).

We estimate that there are about fifty active vision quest programs in the United States, Canada, Europe, Australia, New Zealand, and South Africa—mostly small operations offering one to five quests per year, with perhaps a dozen programs leading six to eight a year. These findings are based on the 120-plus dues-paying members of the Wilderness Guides Council, the international organization of vision quest guides (Riley 1999). Most vision quest programs serve mixed groups of men and women, but some focus on specialized clients; for example, youth, women, men, families, recovering addicts, or persons in counseling.

Vision Quests by Wilderness Transitions, Inc.

One company that offers vision quests is Wilderness Transitions, Inc. They conduct five or six a year for clients who pay U.S. \$595, plus their own transportation expenses, to attend four pretrip meetings, an

eight-day trip to wilderness that includes four days and nights of solo fasting, and a trip reunion two weeks after the return (Riley and others 1998). The vision quests are advertised at activity fairs like the San Francisco Whole Life Exposition and in local resource directories like *Common Ground*, always inviting potential clients to a free slide show about the vision quest. After the slide show, viewers who are interested and make the financial and emotional commitment for going on a vision quest stay for the first pretrip meeting.

A Typical Wilderness Transitions, Inc., Vision Quest

The lifeblood of any business is satisfied customers, so questers are prepared carefully in four pretrip meetings, covering such things as how to prepare for the four days and nights of fasting alone, and what kind of backpacking equipment is needed. Leave No Trace camping and safety procedures are taught. Travel arrangements are made. A constant focus is helping questers develop their intent—that is, what they hope to get from their quest. In addition to practices such as writing in a journal and recording dreams, time-honored rituals, ceremonies, and meditation techniques are often suggested as ways to help certain questers achieve their intent. A key part of the preparation is the nature walk, a day alone in the out-of-doors early in the preparation, and during which exposure to nature may stimulate deeper thoughts about the intent of one's quest. Wilderness Transitions, Inc., has used the process described for ten years. Other vision quest programs may vary in the time spent in different activities but always include preparation, a solo fast, and sharing stories after the return.

Trips usually begin on a Saturday, when the six to twelve questers travel the 480 to 800 kilometers (300 to 500 miles) to a base camp near the end of road access in a desert or mountain area in California or Nevada; the location and elevation of the trip depend on the season. After setting up base camp and providing orientation and safety information, questers explore the area to find a solo site with their desired degree of isolation, but usually only one to three kilometers (one-half to two miles) from base camp. In the evening, preparation continues around a campfire, always using a fire-pan and wood brought from home in desert areas. The next day questers continue their search for a solo site and, on finding it, may take out some of the four gallons of water they will use during their fast—one for each day. During this time a personal conference is held with each quester to help them further prepare, clarify their intent for the solo fast, relieve anxieties, and ensure safety.

Group meetings in a traditional circle (council) these two days in base camp are rich in sharing of excitement and anticipation. Further instruction is given in safety and in techniques for writing in a journal and recording experiences and the abundant dreams that will come on the solo fast. Depending on personal preference, simple rituals and ceremony may be suggested to help questers get in touch with their feelings and address the issues that brought them on their quest.

Early the third day in base camp, after hot drinks, a final group meeting, and good-byes, the questers—now backpackers—go out to spend four days and nights alone. Each day they will leave a sign of their well-being at a predetermined place in a mutual check-in with a buddy. On the morning of the fifth day they return to the base camp, usually clear-eyed and feeling empowered, to joyously greet their community of fellow questers. After a breakfast of fruit salad, a council is held where each quester's story is heard, acknowledged, and appreciated. High emotions continue in the now close-knit group as the journey home begins, stopping at hot springs or a sauna, salad bar, and often camping overnight.

Two weeks later, a reunion is held, and questers share their experience in the hardest part of the quest, the return to daily life. Here they learn the truth of Black Elk's wisdom: the real difficulty of a vision is living it in the world for all the people to see.

Methods and Findings

Since we studied clients from only one wilderness vision questing program, operated by Wilderness Transitions, Inc., we make no claim that these clients represent those from other organizations offering similar experiences. The value of studying this one program is that during the entire ten-year period of the study, the same process was led by the same leader, Marilyn Riley (assisted by Betty Warren), minimizing two potentially important sources of variation—the program process and leadership.

How Many Questers?

During the ten-year period of 1988 through spring 1997, a total of 297 persons went on vision quests with Wilderness Transitions, Inc.; 65 percent of them were women and 35 percent were men. Thirty of these individual quests were by repeat clients (about 10 percent), so we subtracted them and also subtracted twenty-seven former clients whose addresses could not be located, thereby arriving at a total of 240 potential questionnaire respondents. Seventy-eight percent of these former vision questers responded to our one-page questionnaire after three mailings—a 76 percent response rate for women and 81 percent by men.

Who Were the Vision Questers?

The questers were almost exclusively urban, and while some had been camping, most had never been to wilderness. About three-fourths were from the San Francisco Bay area, but with an increasing number from out of state, and some from other countries. Because this is a commercial wilderness program advertised to the public, we were interested in how these clients compared demographically to the typically young adult, upper-middle class wilderness recreationists. We found them to be similar in that they were highly educated: 63 percent were college graduates, and 36 percent had completed post-graduate work. Not surprisingly, given this high degree of educational attainment, most were employed in upper-middle class jobs such as healing and counseling (26 percent), business or government (24 percent), teaching/education (13 percent), and computer/technical (11 percent). We think it is interesting that more than one-fourth (26 percent) were employed in jobs in the healing and counseling category, which includes psychotherapists, nurses, massage therapists, and others one might expect to believe in the natural healing qualities of a vision quest experience in nature.

Thus, in education and occupation these vision questers resembled traditional wilderness recreationists. But they differed from traditional wilderness visitors in age and gender. The vision questers were older, 52 percent of them being over forty and 17 percent being over fifty years old. Women outnumbered men 2 to 1 and were also older, with 62 percent of them being over forty compared to 38 percent of the men. The predominance of women may be due to the fact that two women led Wilderness Transitions's trips. The leaders also felt that a great many of the women questers were seeking healing from wounds related to their gender, such as sexual discrimination, harassment, or abuse. The older age of the vision questers may reflect the greater likelihood of mature persons to seek introspective experiences.

Why Did They Quest?

Each respondent indicated their first and second most important reason for going on a wilderness vision quest from a list of common reasons gleaned from leader perceptions and trip evaluation reports collected by Wilderness Transitions, Inc., over the years. Based on conventional wisdom about wilderness recreation, one might think that “adventure/challenge” and “recreation/nature experience” would have been selected as key reasons for going on any wilderness trip. But only 7 percent of these wilderness vision questers selected “adventure/challenge” and only 3 percent selected “recreation/nature experience” as their first most important reason for going on a vision quest (see table 1). Further, only 9 percent selected “adventure/challenge” and 2 percent selected “recreation/nature experience” as their second most important reason (see table 1).

The first and second “most important reasons” cited by our respondents for going on a vision quest were (see table 1): “spiritual journey/self discovery” (33 and 24 percent); “personal renewal, fresh perspective” (18 and 25 percent); “life stage transition” (14 and 12 percent); and “personal empowerment” (11 and 12 percent). Thus, the motives for going on a wilderness vision quest overwhelmingly suggest a spiritual and deeply personal search for self-discovery, insight, renewal, and meaningful transition in these clients’ lives.

What Benefits Did They Report?

We also asked the questers: “In your own words, what were the most important benefits you gained from participating in a wilderness vision quest?” On the average, respondents included two concepts in their narrative answer. We coded their responses to this open-ended question into 406 comments using qualitative analysis procedures described by Strauss and Corbin (1990). We began by tabulating key words and phrases actually used by the respondents (open codes), gradually combining them into twelve similar categories called axial codes, and finally merging them into a few central themes called selective codes (see table 2). Axial codes implied benefits relating to the “self” (56 percent), and 44 percent relating to what we call “other,” or a greater connection to the larger universe.

Benefits Related to the Self

More than half (56 percent) of the key words and phrases in the respondents’ descriptions of benefits they said they received related to “the self” (see table 2). There appeared to be a “Self Awareness leading to Empowerment leading to Connection with Other (Spirituality)” continuum in the pattern of responses (see figure 1).

There are two important elements in this continuum. First, the responses implied various degrees of depth of self-connection, ranging from self-awareness (shallower) to feelings of self-reliance and empowerment (deeper). For example, benefit comments in category 1, self-connection/awareness, seemed shallower than comments in category 2, self-discovery/identity/purpose, or in category 3, clarity/insight/self-understanding. The apparent “depth of self-connection trend” continues with category 4, self-knowledge/acceptance, followed by category 5, self-confidence/reliance, category 6, facing fears/trusting nature, and category 7, empowerment/strengthened.

The data forming these seven categories are based on key words and phrases from individual respondents, which often implied that the person was at one point on the continuum or another. But actual

phrases from some respondents implied movement along the continuum during the course of their quest. It was as if the fruits of increasing depth in “connections to self” were born in feelings of self-reliance, courage to face fears, and empowerment.

Benefits Related to Other

Forty-four percent of the key words and phrases in the respondents’ descriptions of benefits implied “connections to other,” or the larger universe. Specifically, several categories reflect an outward focus—on “other” rather than “self.” For example, in table 2, category 8, “connection to nature,” reflects a focus on “other” and category 9, “spirituality/connectedness” included comments on feelings of being “interconnected to all things,” or “the universe” (a spiritual idea). Likewise, category 10, “healing/renewal,” reflected such things as “new perspective” and “new direction,” which also implies a focus on “other” rather than self because they reflect a different (healed and renewed) view of the world in relation to the individual. For example, one quester wrote, “I gained a new perspective on my life. A renewal of my spirit. Reconnecting to the earth.” Another quester wrote, “Fasting and solitude in the wilderness for four days provided the space to go inwards and relate to my own internal world while at the same time experiencing myself as part of the vast universe, that is, connection with inside and outside.”

Our “spirituality/connectedness,” category included many comments such as “feeling connected to all things” or “oneness” that parallel the definitions of spirituality in the literature (McDonald 1989).

We believe these data suggest a process by which spiritual experiences in wilderness and nature may come about. That is, increasing degrees of connections to self, culminating in feelings of reliance, strength, and empowerment, may then lead to experiences of spirituality—defined as a focus on “other” rather than “self,” including feelings of oneness and interconnectedness to all things (see figure 1). It’s as if one must progress from a strong connection to self in nature as preparation for experiencing spirituality in nature. For example, one quester said, “The benefit I gained from participating was having the experience of opening to continuous deeper layers and levels of myself and my surroundings.” Another quester said, “The benefit I gained was the time alone away from all distractions to really search within and find my answers . . . and I was able to (then) really connect through nature to my higher self.”

We were surprised that comments reflecting “community” as a benefit comprised only 6 percent of our response, since the group is an important part of vision questing, and strong bonds of friendship are formed in the course of sharing such a deep experience. But the data obviously indicate that such sociability, while important, is subordinate to the enhanced self-awareness, empowerment, and spiritual benefits.

Is Vision Questing Wilderness-Dependent?

But is wilderness, defined as an area with naturalness and solitude, really needed in order for vision quests to result in the kind of self-discovery, empowerment, and spirituality benefits we found? The respondents in our study emphatically said “yes.” When asked the question, “Would the vision quest experience have been just as effective in a developed recreation area with roads and campgrounds?” One hundred percent of them said, “No!” Their reasons given to support this answer: distractions (evidence) of civilization (25 percent); lack of solitude (26 percent); lack of (dilution of) naturalness (27 percent); threat of human intrusions (13 percent); and lack of (less) challenge (9 percent).

Thus, reduced solitude and naturalness, distinguishing characteristics of wilderness, were decisive reasons for rejecting “developed recreation areas with roads and campgrounds” as potential locations for a vision quest. Further affirming the importance of naturalness and solitude was response to a direct question: “How important was being in a wilderness setting with naturalness and solitude to gaining benefits from your vision quest?” Conclusively, 98 percent checked “very important,” with the remaining 2 percent saying “important.” Nobody said “unimportant” or “very unimportant.”

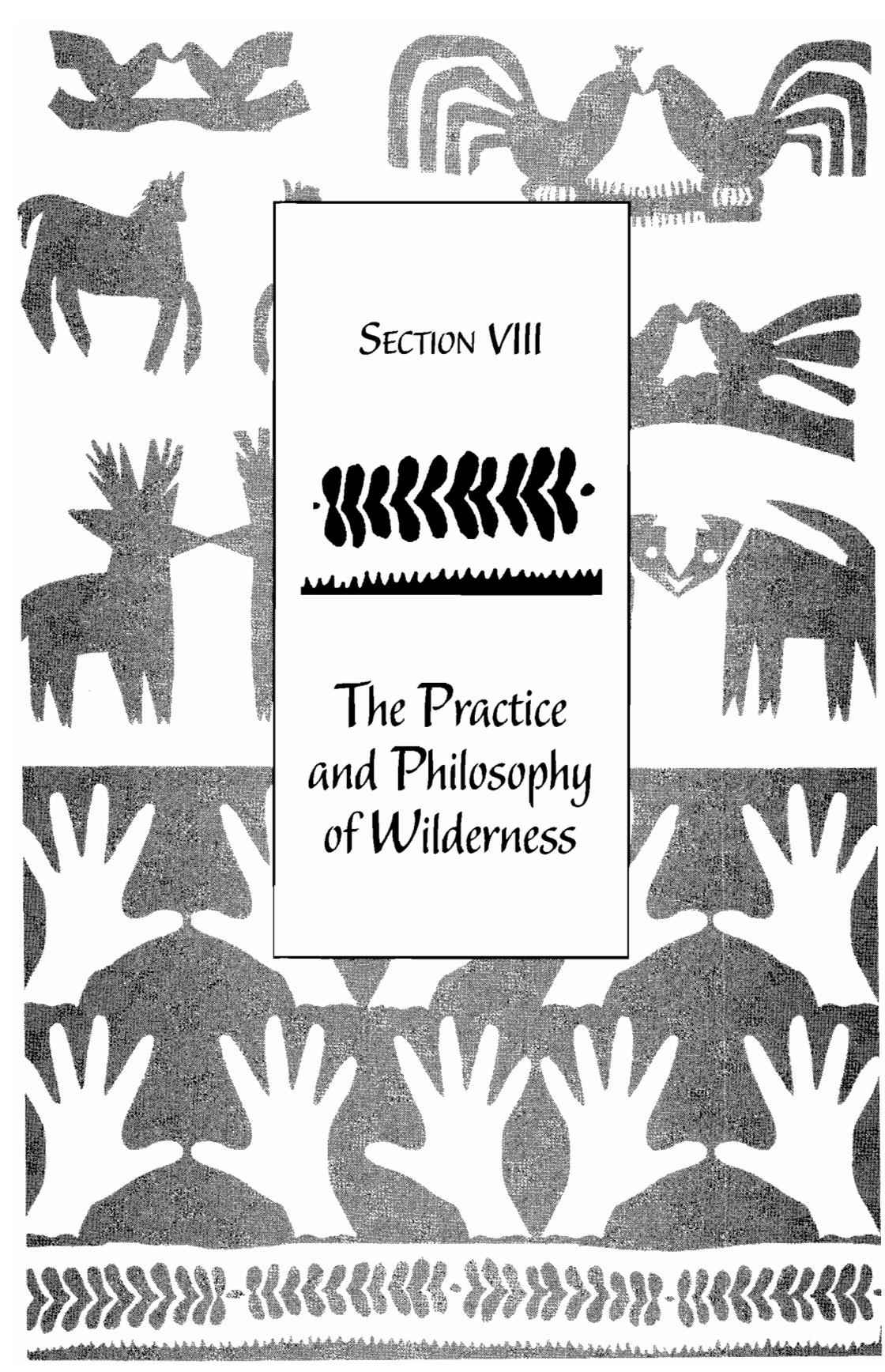
Summary and Conclusions

WEPs bring paying clients to wilderness and related areas for personal growth, therapy, and education. This study of wilderness vision quest clients (one kind of WEP) from a ten-year period (1988 to 1997) revealed that the vast majority of these novice, urban wilderness users went on their vision quest in search of spiritual insight, personal transition, and renewal—not challenge adventure or recreation (see table 1). These vision questers resembled typical wilderness recreationists in being highly educated and engaged in upper-middle class occupations, but they were older, and two-thirds were female. The reported benefits from their wilderness vision quest experience, which included four days and nights fasting alone, suggest that increasing degrees of connections to oneself in nature, culminating in feelings of self-reliance, strength, and empowerment, may then lead to experiences of spirituality. Here spirituality is defined as a focus on “other” rather than “self,” and includes feelings of oneness and interconnectedness to all things. It is as if one must progress from a strong connection with self in nature as preparation for experiencing spirituality in nature.

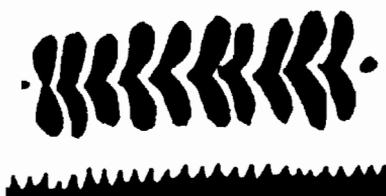
The questers were emphatic in their view that their vision quests needed natural surroundings, with 100 percent of them stating that their experience would not have been as effective in a developed recreation area with roads and campgrounds, because of the lack of naturalness (27 percent), reduced solitude (26 percent), and distractions of civilization (25 percent). Being in a wilderness setting with naturalness and solitude was cited as very important (98 percent) or important (2 percent) to gaining benefits from their vision quest.

In conclusion, we believe these findings reveal that:

- Wilderness vision questing, an ancient rite of passage featuring time alone in nature while fasting, also attracts modern people seeking personal growth, renewal, and transition from wilderness experience. They quest in the wilderness because they seek to know who they are and the meaning of their life journey.
- The vision questers we studied perceived wilderness as a spiritual, healing, and growing place, where reflective experiences are available as an antidote to the pressures of modern society, and for life renewal and transition. They document the spiritual and healing values of wilderness.
- Naturalness and solitude, distinguishing characteristics of wilderness, were perceived as essential conditions for gaining the personal benefits reported by these vision questers. Thus, protection of wilderness to ensure the continued existence of areas with naturalness and solitude is important to modern people who may seek healing, new insights, and personal truth through wilderness vision questing and other wilderness experiences.



SECTION VIII



The Practice
and Philosophy
of Wilderness



The Questionable Ethics of Treating Wild Animals as “Resources” for Human Use

Ranjit Konkar

Beauty Without Cruelty (BWC) strongly disagrees with the policy of “sustainable use of wild species” as promoted by international organizations working for conservation. The basis of the policy is in conflict with BWC ethics. BWC does not feel that people have a right to derive economic or other benefits from wild species; nor do we accept that there can be unavoidable or necessary killing. As believers in animal rights, we uphold the right of each and every creature on earth to live without being exploited or killed for any reason whatsoever. We should care for and wish to protect all animals, wild species included. Compassion for all living creatures is what needs to be upheld, irrespective of whether the species is in abundance or not. We should have reverence for all life and not for a moment consider wild species as renewable resources to be exploited commercially.

We could confidently add that those who believe in breeding for “harvesting” (meat, bones, skin, antlers, etc.) are only those who talk of or who want to preserve the wild species concerned for what they themselves can commercially gain by farming/hunting them. In them, there is no question of genuine protection, let alone love for the wildlife.

No animal should be considered as a “resource” for humans. Animals have a purpose for existence that is independent of the existence of humans—in all likelihood, their existence would flower more in humans’ absence than because of our patronizing subjugation of them.

The history of considering animals as resources for us is long, probably as long as humans’ advent to settled civilization. It was naturally the more docile, timid, herbivorous animals that we managed to subjugate and tame into living with us. The larger, more ferocious, and carnivorous animals retained their homes in the wilderness but not free from human abuse. The habitats of wild animals—the wildernesses of the world like the high seas, the deep jungles, the deserts, and the tundra—being generally hostile or inaccessible to humans, allowed them to escape the institutionalized abuse that we heaped upon our domesticated friends over the centuries. This culminated in this half century’s disgrace of factory farming. Death at human hands would generally be cases of local populations subsisting on hunting and trapping. Absence of extensive transport facilities and of technologies of mass production and storage kept most kills a local issue. Cruel as these deaths of wild animals were, their lives as long as they lasted would at least be lived in freedom.

Abuse of Wild Animals

The abuse of wild animals at our hands found new patrons as the march of our civilization continued. Earlier hunted only by local, indigenous populations, and then only for their body parts like flesh, skins,

and horns, over the centuries more and more wild animals began to be captured for reasons other than for basic subsistence. And they were hunted by people other than hunting tribals and for markers other than local, often spanning the globe. A market grew for uses such as entertainment (Roman to present-day circuses), decorative adornments of homes (caged birds and fish tanks), religious association (maintaining “temple elephants,” sacrificing migratory birds), for supposed education (zoos, aquariums), and research (breeding zoos, laboratories), to name a few.

Elephants, tigers, and lions are captured from the wild, separated from their herd, and brought to the artificial, urban jungles of humans to be trained as circus animals using the most barbaric methods imaginable. All sorts of wildlife are jailed for a lifetime at zoos, frequently in cages that do not allow basic freedom of movement to limbs. Fish, which roam the seas, are captured and imprisoned in glass jails called aquariums, so that we may “educate” ourselves about the natural world. Primates are torn away from their forest habitats, wrenched from their offspring or parents, and subjected to the horrors of medical research by deliberately being inflicted with germs of diseases like AIDS, which are caused solely and are preventable entirely by choice of human living habits. Ironically, God is used as an excuse for much wild animal abuse in India: The most graceful and magnificent migratory birds are hunted using shotguns and offered as sacrifices to God by semi-urban people not more than 10 kilometers from Bangalore. Elephants are uprooted from their herd in the wild and brought to the temples of Kerala to perform the task of temple elephants. They suffer the hot concrete surfaces of the temple and the pointed goad of the trainer. Such are the various forms in which wild animals encounter people.

In a final blow to their freedom, wild animals too began to be “farmed” for their body parts much like domestic cattle. The fur industry was the first to bring the horrors of factory farming to the denizens of the wild. They enclosed beautiful furry animals of the wild, such as the mink and the silver fox, into metal cages where they lived their lives and where they died a suffocating death. Crocodiles and ostriches began to be “farmed,” rabbits bred to be killed, all because they are an economic resource for humans.

With their operations no longer secret and public sympathy frequently not on their sides, the supply side of the industry has had to devise strategies to perpetuate their business. On the other side, the creator of the demand for the many products and benefits of the wild—the urban dweller wielding the power of the purse—is similarly unable to give up his alligator shoes or the silver fox fur coat that she feels she needs to protect herself from the cold. Neither she nor he can resist “trying out” ostrich meat at a fancy restaurant—when the supply exists, why should the demand fall far behind?

Besides the direct demand of individuals for items of animal origin, there is a heavy burden that humans’ progress forward in the march of civilization has indirectly placed on wildlife. Unsustainable burdens have taken a heavy toll on the wild animals of this earth:

- Uncontrolled horizontal growth of cities that result in human encroachment upon wildlife habitats
- Decimated forests for industry
- Development policies that allow roads and railways to run through jungles
- Development inside jungles that do not allow the adoption of a coexistential ethic
- Population growth that leaves one gasping
- Shockingly intrusive notions of tourism, including safaris, game sightings, motor boating in lakes used by wild animals for drinking, etc.
- Adoption of lifestyles that are unsustainable

*Compromises—
At the Cost of the Victim*

Unfortunately, the solutions that we have come up with to check this toll have tended to display a stubborn refusal to change our ways, even after acknowledging our faults. Everyone knows that the piece of ivory they own has come from a killed elephant. Yet the demand for ivory does not abate. Everyone knows the reality behind obtaining fur. Yet they cannot give up the temptation of wearing a fur coat. They know that eating the meat of ostrich supports the artificial rearing and a not-so-easy death of the magnificent bird. But the taste buds win.

To arrive at a compromise between those who demand that wild animals be left alone and the commercial interests who want all regulation to go, many agencies whose mandate it is to work for the defense of the creatures of the wild have capitulated to the industry and have agreed to adopt measures that ensure sustenance of not the animal victim but the businesses, and that would not be acceptable if the victims were anybody but voiceless creatures.

*Abuses in the
name of conservation*

What are some examples of the abuses carried out in the name of solving the problem?

1. *Limited "cropping"*: The creators of the demand for animal products like fur, hide, and cosmetic ingredients, if at all moved by the visual evidence of the suffering they cause to the wild animals, rather than give up use of the product, demand instead that the source of their supply come from special, reserved areas where it is "all right" to kill a "fixed number" of animals to supply their needs. This is the genesis of animal farms, where words like harvest attain a new, macabre meaning.
2. *Legalized hunting*: In an effort to pacify the hunting enthusiasts, mostly with political or otherwise influential connections, a certain number of licenses are issued to such people for them to exercise their right to kill defenseless creatures.
3. *Culling for population control*: Perhaps the most tragic is the situation where the success of a conservation program results in the number of animals exceeding the number that the program managers wish to see on that piece of land. The solution that is adopted—picking among them and shooting them to death—makes one wonder why the conservation program was implemented in the first place. Why is it better for the elephant to die at the hands of a park ranger designated to shoot than at the hands of a poacher? And on what scientific basis was the decided number arrived at?

We might also do well to ask ourselves which is the species on earth whose population is the cause for the greatest concern today? Humans. Would we ever consider solutions for this concern that come even close to those adopted for curtailing the population of other species?

Objections to the Concept of "Sustainable consumptive use"

The notion of sustainable consumptive use is entirely selfish, anthropocentric, and utilitarian. It asks: What is the maximum I can extract from the animal species without being the embarrassing cause of their extinction? Its lack of respect toward the subject animals cannot be more obvious. Put another way, it asks: How much abuse can the animals sustain to provide me my never-ending list of frivolous demands?

1. *The ethical problem:* commodification of live, sentient animals causing pain, suffering, and loss of life to them.
2. *Sanctity of individual life versus conservation of species:* While the goal of preventing any species from going extinct is laudable and very much to be worked for where this danger is present, we feel it is a very limited goal, and sometimes one that is used to justify a self-serving goal. By this I mean that it is turned around and presented as an argument to condone slaughter just because species extinction is not in threat. The sanctity of individual life must be placed above the perceived importance of perpetuation of a species. It is notable that preserving individual life preserves the species, but not the other way round. Surely, then, conservationists should have no difficulty in adopting the first attitude as one of their means. The ethic of non-violence reaps the same rewards of conventional conservation and in an obviously more peaceful way.
3. *Difficulty of limiting the scope of this concept:*

a.) Through "use" and "domestication" today's wild species become tomorrow's farm animals, open to all sorts of legal abuse. An example is ostrich farming. An animal that not more than a hundred years ago was to be found only in the wild, living life as nature intended, was taken indoors (or at least within paddocks) and reared artificially. Today, it no longer qualifies for protection under wildlife laws because the past century's subjugation under the hands of humans has deprived it of that status. With no laws on its side, its callous treatment for achieving the goal of putting the maximum weight of meat per bird on the table at the least possible cost, goes unchecked.

b.) If opened up for one species, all receive the brunt. Proliferation is unpredictable. One example is the intensive "factory" farming of domestic animals: Intended for hens, now rabbits, milch cattle, and goats are all being targeted for factory farming. How is such proliferation to be checked in the case of wildlife?

4. *Projection of "sustainable use" as the only solution*

Perhaps the most objectionable argument for sustainable use is that nothing else would work. This is simply the case of not wanting to try out the hard but permanent solutions. Or a smoke screen to hide our inability to curtail our desires or change our habits.

Examples of successful peaceful coexistence of people and animals and of ethics-based conservation do exist. Two cases worthy of mention are the Bishnoi tribe of Rajasthan and the village of Kokre Bellur of Karnataka. The Bishnoi are a people with deep attachment to their animals, and not in the manner that a livestock farmer has for his farm animals. The Bishnoi are strict vegetarians and would never tolerate the

harming of their animals in any way. They extend their brotherhood to the wild animals in their countryside, such as the black buck and the chinkara, as well as to their domesticated animals. Kokre Bellur is a village that happens to be a stopover in the journey of migrating pelicans each year. The villagers see them as their guests and do not allow any harm to come to them. A hands-off policy is implemented by the villagers upon visitors to Kokre Bellur who display intentions of handling or feeding the pelicans in any way. Both these places are examples of how humans have chosen to live in a harmonious way with his animal coinhabitants without involving harm at any stage, and based not on any commercial or utilitarian principle, but on ethical coexistence.

Another example, illustrating the lengths that humans have gone in their sacrifice of self for the sake of their animals is that of farmers in Gujarat during the famine of 1987. In a world where at the slightest sign of fall in profits from keeping animals alive their owners all too ready sell them off to the slaughterers, it is reported that many a farmer from this largely vegetarian state chose to walk hundreds of miles to feed his cattle rather than sell his cattle to the butcher.

While it is not implied that an example in one part of the world would be replicable in another in all its details, effort to understand and follow the underlying attitudes should surely be made. The specific animal may vary from place to place, dietary habits also vary; but there seems to be no reason for our *attitudes* toward all animals to not be one of nonkilling, noninjury, nonharming. Do we not seek to universalize the values of equality of all humans, of men and women, the special treatment that children, senior citizens, and handicapped must be given? Can we not similarly learn from examples of benevolent, peace-promoting attitudes toward animals from other societies and religions of the world?

5. *Propagation of falsehoods*: The attitude of people toward vegetarianism is illustrative of turning a blind eye to a solution that stares us in the face, and turning instead to technologically savvy and often inhumane alternatives. I have heard it said that there is a food shortage in the world. That the cultivable area of the earth has almost run out. That under these circumstances it is impossible to sustain a completely vegetarian population. I have had to face audiences full of people at wildlife-related conferences who seem to have been brainwashed into accepting this idea. I have heard eminent veterinarians justify farming hitherto untamed species like crocodiles and rabbits for their meat as the only solution that will save the people of this overrun planet from starving to death.

Research after research points out that the *only* diet that will sustain the growing human population on this earth is the vegetarian diet. The number of vegetarians that can be supported on the same land that supports one nonvegetarian can be as high as twenty! Rearing animals for food places a tremendous burden on the earth's natural resources, such as water, land, soil fertility, *etc.*, and provides the worst nutrition to people. The amount of water it takes to raise a steer to slaughter age is enough to float a destroyer! Eighty percent of grain grown in the industrialized countries that can be directly fed to human beings is instead fed to fatten the animals raised for meat. The ratio of plant protein fed to a cow to the yield of animal protein from the cow is 16 to 1! People who choose to ignore these facts have the burden of proving it otherwise before they recommend killing more animals.

The Ethics Argument

In presenting an ethics-based argument, we do not wish to preach as if to people unfamiliar with the value. We do not wish to put down the efforts of our sister organizations whose goal is also the reduction of suffering of animals. We recognize that they have different mandates and that within those mandates they face severe constraints, and that they are constantly striving to arrive at solutions within those constraints. With them we chiefly differ in the extent to which to go: Often they fall short of where we think one should go. However, in the case of people advocating animal farms and sustainable consumptive use of animals, we differ fundamentally and oppose their position outright.

The main goal of bringing up the topic at a forum like this is to point out to people the insensitivity that is creeping into our outlook toward animals. When all current trends point to a “utilitarian” attitude toward other animal life, we would like to remind people of the higher goal that, as the only species holding the value of empathy, we must constantly strive for in keeping with the demand of ethics.

This ethical demand is simple: *not to do to others that which we would not like done to us*. Life is dear to each one of us, perhaps the dearest possession we have. No one wants her or his life to be terminated ahead of time, and least of all, at the behest of someone else. In general, none of us would like to be harmed in *any* way, mentally, psychologically, or physically. Thus, not causing willful harm to any living creature that has not harmed us is presented as the most important value on this earth. Sanctity of life, especially that belonging to sentient creatures, is the *most important value* to uphold. Sight of this fact must not be lost in arriving at any solution that involves deciding upon the lives of sentient creatures, be they stray dogs or wild elephants. BWC makes no distinction between the sanctity of life of any creature. Human or nonhuman, domestic or wild, beautiful or ugly, exotic or common, useful to humanity or useless for human ends, the rights of all creatures to lives of unhindered freedom from the interference of human beings are considered inviolate. Their lives are not ours to decide what to do with, what use to put to, or give a value to. The dearness of life to the holder of that life is the most important measure of the value of that life.

Can there be a more fundamental and important right than the right to live in unhindered freedom? Do we, or do we not, want to live up to the ideals of our spiritual leaders? One can either be a practitioner of nonviolence or be practicing culling in the name of conservation.

The root of the whole problem and the human-nature conflict is: selfishness. Thought only of self. Our holding the suffering of others as of lesser importance than the gratification—sometimes shockingly trivial—of self. Our refusal to relent on any of our demands, and our insistence on continuing consumption of resources, knowing full well they are near depletion. Our steadfast refusal to adopt solutions that work but involve manual labor, simplicity, or are more time-consuming. In short, our desire to get, to receive, to be awarded, without giving, without sacrificing, without rewarding. To want everything without giving anything substantial.

It is true that it is easy to be an armchair critic and prescribe ideal, utopian solutions, and that putting principles into practice is not so easy. But where do we see at least the effort made to address the real problems? Any number of examples present themselves as our—I can only stop short of saying deliberate—distancing ourselves from difficult, yet the only real, solutions. Let us consider a related example: the perceived problem of stray dogs. The only reason stray dogs thrive in cities is the easy availability of food for them. In the refuse thrown out in the open by hotels and restaurants, in our garbage lying uncollected in the open for days, in the butcher throwing out pieces of meat to the neighborhood dogs as he prepares his cuts. When these naturally attract the

stray animals, they are punished for it. Caught in the most inhuman manner, taken to the dog pound, there to await the corporation's electric prod, they seem to be the guilty party for taking away from us our right to live in filth and refuse. The goal of 100 percent sanitation is never on any politician's agenda. People, when discussing the stray dog menace, are quick to blame it all on activism against the execution of dogs. But they do not acknowledge their own responsibility of not making a food source available to these dogs. Or should I say *our* responsibility. We are all responsible for improving conditions around us. But how many of us take the trouble to do so?

Killing should never be the rule, always the exception. We should never consider ourselves justified in taking another's life except in some extreme and pathologically abnormal case of self-defense (in which case, we may point out, society even excuses the taking of human life).

The Solutions

If such are the problems, then what are the solutions? BWC's thesis is that if there was no killing, no problems related to either sustainability or conservation would arise in this world. It is through human interference (invariably destructive) in the play of nature that imbalances and conflicts are introduced, creating situations of confrontation and competition.

If we truly desire to see the end of exploitation of animals and environment, human society must be prepared to take the following measures:

At a personal level:

1. Not be a consumer of any animal product. Turn vegan. Stop eating that meat. Throw out that leather shoe. One cannot begin to imagine the relief we would cause to the animals, to the environment, to the economy, to the ecology, by giving up use of animal products. This step will bring with it two things: a relief of at least not being personally contributory to the killing of wild animals far away, and a definite if long-term reduction in the market for that item. If anyone doubts the viability of such a lifestyle, let them know that hundreds of thousands of people around the world are actually living such lives day in and day out.
2. Not keep caged birds. Aside from the obvious cruelty of imprisoning a creature made to fly in the open skies, the importance of this also relates to the vast trade in wild birds that happens internationally, resulting in millions of birds from various parts of the country ending up in pet stores.
3. Not live lifestyles that place a heavy demand upon the environment. This pertains to the chain of demands that is inherent in a high-consumption lifestyle. Take one example: use of excessive furniture in the house. The dining table was not part of the Indian household's furnishing until recently. One would sit on the floor and eat. With the dining table and the six chairs that go with the table, up went the per capita consumption of wood. Where was the wood to be supplied from but the forests? The same forests that the elephant wanted to live in. But we started demolishing the elephant's home because we wanted to furnish ours with it and emulate the West in its ways of dining around a table.

These steps are well within the scope of each individual to practice in her or his own daily lives.

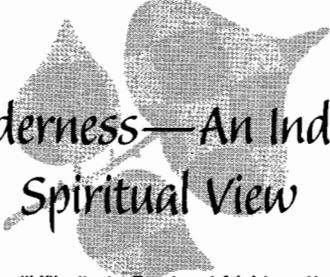
At a collective level:

1. Punish both the buyer and the seller of parts from wild animals.
2. Ban the keeping of caged birds, much as being in possession of wildlife is illegal.

3. Abolish animal acts in circuses. The time for this has come. Torture of animals for performing acts is an anachronism and has no justification. It has to go. Zoos that put animals in cages or chain them must be shut down—they have no reason to continue. These are simply not the homes of the wild animals and nothing is to be learned from watching them in these environs.
4. Abolish the use of animals in testing of laboratory products and for laboratory experimentation. As a working compromise, one may think of a time-bound program such as:
 - i. giving up use of wild animals for any testing,
 - ii. giving up use of all animals for testing all but life-saving drugs, and
 - iii. practice the three R's: reduce, reuse, refine,
 while alternatives are found out which will make use of animals for this purpose redundant.
5. Allocate money and human resources extensively toward education and awareness. The remaining steps are to be taken by organizations more than by individuals. Let them go and photograph or film or videotape the abuses being heaped on wild animals or any aspect of the wilderness. Let these pictures and films be screened extensively at all available opportunities. Have humane educators educate the children and the parents of these children. Let people see for once the cost of their unsustainable lifestyles. Only after making all these efforts and failing would we be justified in looking for other ways out.

BWC does not claim to have the answers to all the problems. But we do insist that any answer that is propounded behoove us human beings, the only animal for whom morals are an issue. We have also consistently maintained that reform begins with the individual. And if everyone agreed to reforming herself/himself, it would end with the individual too.

Aren't humans amazing animals? They kill wildlife—birds, kangaroos, deer, all kinds of cats, coyotes, beavers, groundhogs, mice, foxes, and dingoes—by the millions in order to protect domestic animals and their feed. Then they kill domestic animals by the billions and eat them. This in turn kills people by the millions, because eating all those animals leads to degenerative—and fatal—health conditions like heart disease, kidney disease, and cancer. So then people torture and kill millions more animals to look for cures for these diseases. Elsewhere, millions of other human beings are being killed by hunger and malnutrition because food they could eat is being used to fatten domestic animals. Meanwhile, some people are dying of sad laughter at the absurdity of man, who kills so easily and so violently, and once a year sends out cards praying for “Peace on Earth.”



Wilderness—An Indian Spiritual View

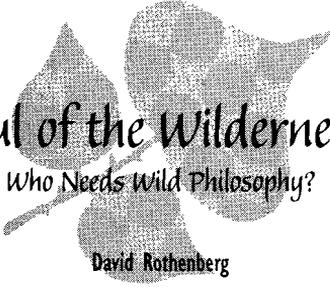
Swamiji Vibudhesha Teertha of Sri Admar Mutt

Nature knows how to preserve its creation. All animals except human beings cooperate with nature in this task of preservation. Mental perversion causes human beings to create problems for nature. As humans pollute the atmosphere of the world, they dig their own graves.

Nature that is untouched by perverted human beings is wilderness; and wilderness is essential for the survival and healthy evolution of all animals, just as water is essential for fish. Humans have come out of the wilderness, and they are now feeling like fish out of water. There is no wilderness left for them or other animals to reenter. They have destroyed wilderness that cannot be regained.

As the whole universe is on its one-way path toward decay and disintegration, with no coming back, consequently, all animals are proceeding on this one-way path toward their ultimate destruction. As Prince Philip of England narrated, “We are acting like children who go on blowing balloons and do not know when they would burst.” Likewise, humanity keeps polluting the world’s atmosphere without knowing when the pollution will make life on earth impossible.

There is a slight hope of continued survival for all animals if humanity takes remedial steps like reforestation, disarmament, and purification of the atmosphere. Humans need to switch to power sources such as solar, wind, and water energy to run machinery that will not pollute the atmosphere any further like nuclear power and fossil fuels have done. Humanity must try to bring the wilderness back partially, if not fully, to delay the ultimate end of living beings.



Soul of the Wilderness:

Who Needs Wild Philosophy?

David Rothenberg

Environmental activists, wildland and wildlife managers, environmental policy makers, and politicians have every right to ask what place philosophy has in the heated discussion on the future of wilderness. Every philosopher ought to ask herself the same question, so as to avoid being caught in the conceptual spirals that can be the hallmark of the discipline of which D. T. Suzuki once said, “This is what I love about philosophy—no one wins.” It is Hermann Hesse’s glass bead game of concepts, the free flow of the rest of ideas. Fun, frustrating, endless, beautiful at best, nitpicking, and cold at worst. “Philosophers,” warned Keats, “are the kind who would pull off angels’ wings.” We are not satisfied with belief. We claim to want to explain things, but we remain best at asking questions.

But environmental philosophy is applied philosophy, which means it uses this questioning approach ostensibly to help solve real world problems, in this case, the clarification of how humanity should relate to the natural world. We need to examine the fate of wilderness as an idea, to help define the wild place as something that can be understood and cared for in all parts of the world, as a concept that may change fluidly as it is reinterpreted inside many cultures and many political systems, to hopefully emerge as something not that all people can agree upon, but something that can be thought about and saved in so many ways.

I will quickly admit my biases: I believe in the value of wilderness. The wild has a place in the hearts of all living beings, somewhere, and that includes all humans. The idea of the wild includes a sense of danger as well as purity, of ultimate naturalness as well as fragility. There are people who can live inside of it, but to love it is to acknowledge a value more than the human, something wider, something larger, that we must work hard to participate in while it is so much easier for the rest of nature to inhabit it. That is the fate of humanity—to have to struggle to fit into nature after our own nature has thrust us out.

The love of wilderness and the desire to maintain it is part of humanity’s rise toward a less selfish state. It is a sign of our growing ability to look beyond ourselves and to expand our care to aspects of nature that are important not because they are useful to us, but because we respect them beyond the limitations of use. The love of wilderness as something precious and worthy is part of the march of civilization and should never be opposed to culture.

“Wilderness” is probably not the most important way humanity should look at nature, though it is one of many important ways we can relate to the world around us. It is important to say this, because as much as wilderness itself has been under siege by those forces in our culture that want to see all of nature as something we can use, the idea of wilderness has come at the same time under conceptual siege, sometimes from very surprising places. It is often historians and philosophers who say they are for the environment but against wilderness, because they see the wild as a narrow and very exclusionary perspective on the natural world, not representative of the real and diverse ways human beings work with and re-understand the land.

In environmental history we have seen William Cronon decry in the pages of *The New York Times Magazine* and in his big anthology *Uncommon Ground*, the idea of wilderness as something naive and unrealistic to those people who actually work with the land. He asks for an environmental ethic and aesthetic based on respect not for the wild reserves thousands of miles from our homes, but for the trees in our backyard, for the health of the family farm, for the understanding of exactly where our food comes from. For him, wilderness exists only as an idea; an idea developed for those who live in cities isolated from nature, where they can imagine of the mountains whatever they will.

Environmental philosopher J. Baird Callicott has been pushing for several years now the argument that believing in wilderness is a kind of old-time religion, based on backward and original colonial American ideas of separating humanity from nature. As such, it is an extremely limited notion on which to found the discipline of environmental philosophy, and because of this, it is a damn shame that it has received so much attention from environmental philosophers in the first century of our discipline. It's time to move beyond this naive separation between ourselves and our surroundings and replace it with sustainable development and biodiversity.

Callicott believes that "implicit in the most passionate pleas for wilderness preservation is a complacency about what passes for civilization." This is an interesting notion, though I don't believe it for a second. It is only a somewhat enlightened civilization that could believe that saving some wild country out there for its own sake has value. This desire is a civilized notion, something from our era, and is a step in the right direction. It should be brought into the wider debate of the kind of relationship humanity should have with nature, not cast aside as a deviant direction.

When it comes to saving wild country, Callicott believes that we should stop talking about something as woolly as wilderness and instead set up "biodiversity reserves" that save endangered species and whole ecosystems in the name of science. That is all fine and good, but I would not call the notion of biodiversity any less culturally constructed than the idea of wilderness. I still suspect the notion of the wild, which might need some renovating, is more inspiring and compelling than the idea of biological diversity, but I might be just the kind of hopeless puritan romantic that Callicott wants to dismiss.

Yet the suggestion that sustainable development might somehow replace concern for wilderness is even more perplexing. The Brundtland Commission said sustainable development is "meeting the needs of the present without compromising the ability of the future to meet its own needs," and that is as wishy-washy an avoidance of our moral responsibility to future generations as anything I could imagine. If we believe in the future, we have to decide things for that future, and not let the future take its own path. If we decide to preserve wilderness in perpetuity, as our forebears in conservation had the insight to do, we take the risk of claiming to know what's best for the future. Modern United Nations and World Bank schemers are too slippery for such real moral commitment.

Why should sustainability be opposed to the identification of, concern for, and preservation of wilderness? I have never been able to understand this fallacy. Perhaps, it's because we like to extrapolate, or inflate the primacy and completeness of whatever point of view we are championing as the true, blue, new right way. Callicott wants sustainability, and for him it supersedes all that came before. Many environmental philosophers, not so interested in people and their problems, put forth wilderness as what matters most. Even William Cronon, when pressed to stop all the nay-saying and announce just what it is that he does believe in, couldn't have agreed with the old naive view more when he said in the pages of *Environmental History* that "wilderness is my religion."

It is easy to see why the wilderness can be a source of spiritual experience and challenge for so many through history. From Moses to Muir, many have needed to be out there away from the civilization that

created them to catch a glimpse of the God who so often slinks from the details of the constructed human world. Yet it has never been the only place to see God, and no one should put the wild forth as the only part of nature that matters so. It is one of many places to touch the greatness that is inherent in the fabric of this world.

But wilderness philosophy is not wilderness religion, and the philosopher who wants to support wilderness should not turn away in disgust from critiques of the idea of wilderness crying blasphemy. Wilderness is much more interesting as philosophical possibility than as religious icon. The responsible philosopher of the wild won't just love it in silence, but will be able to combine his or her own support with relentless questioning. I support the intention behind the critical efforts of Cronon and Callicott, to caution against the "totalizing" tendencies of some all-or-nothing wilderness demagogues, but I protest the negativity of their tones. It is so much easier for intellectuals to say "no" than to say "yes" to anything, for that is the way we are trained to think. It is harder to turn skepticism into support, so that we may refine possibilities and honestly change the world. Yet this is so much more important.

So, I believe that it is imperative to question the idea of wilderness, in order to defend it more forcefully rather than hasten its conceptual destruction. Here are three basic critiques of the idea of wilderness that deserve thoughtful consideration by all supporters of the wild:

1. Wilderness comes from civilization, and it is not an idea that makes much sense to the history of human cultures. I agree. There was never any need to worry about preserving the wilderness when it was something formidable and dangerous, against which humanity defended itself feebly in order to subsist. Times have changed. We have proliferated across the planet. We no longer fear the wild, by and large, but we lament its passing.

This is no mere romanticism. It is an achievement. We are now able to care about what is not primarily of use to us. We may love it for its difference. Sure, this makes nature something separate from the mainstream of human slash-and-burn mentality and activity. But it is a nature still part of nature, a place we come from after a long and hard cultural evolution. The wild will surely win in the end, long after humanity has been rendered irrelevant, so we need not worry about its ultimate survival. Our challenge is to see if we are compatible with its present health and flourishing, and I sincerely hope we are up to the task.

That being said, we must be careful not to make the model of humans separated from nature that identifies wilderness to be the only way or even the most important way we as a species relate to the environment. This brings me to the next critique.

2. Wilderness is not everything. Its preservation has never been the only goal of the environmental movement, or ever the most important goal. True, it may seem to be the most dramatic, the most obvious, or the most photogenic goal, but it should always be seen as one extreme of a diverse movement that exists to encourage our species to reflect carefully on our dependence on and attitude toward the vast world around us.

It is essential that we never use concern for wilderness to distract us from concern for the more immediate ways human beings depend on the environment: using it for food, resources, and designing our habitations so they do not cumulatively pollute and degrade the surroundings. These other areas are perhaps far more directly important for most of us



David Rothenberg. PHOTO COURTESY OF DAVID ROTHENBERG.

in day-to-day life than the saving of wilderness. Knowing that wilderness is safe may be more symbolically important.

I hope that more nations see the realism inherent in designating wilderness. It does not mean a declaration of the rights of nature before the rights of people. It only means the people as a whole decide that sometimes nature must be given its own chance. But the problems that many diverse countries of the world will face when describing wilderness may be quite different from what the United States had to face.

3. Wilderness does imply conflicts between nature and people. For as many examples of indigenous peoples that can be brought up to show that humanity might live in a simpler form of harmony with nature, there are as many instances where it is only the fact of a small population that prevents a people from overharvesting its land. There is much we can learn from the world's traditional subsistence peoples on how to live closely with our surroundings, but in one sense we avoid the real issue by talking too much about indigenous rights when we are pitting humanity against nature in search of the wild.

More often people are agrarian or traders. They work closely with the land, and they buy and sell what they find there. Saving a few places does not mean calling for an end to all commerce. Setting a place aside as wilderness does take it out of the marketplace, and whether we like it or not, this often sets it against the interests of people who live nearby and have had to earn their living from the land. They should be compensated, and they should be brought into discussions of why wilderness can matter to all of us. They should not be punished for having used the land. Sometimes they may be put in charge of the newly demarcated places, but sometimes they are not the ones who know how to manage best.

Indigenous, primal people are changing. Hunters and harvesters are changing. It is not in our interest to halt this change. Their histories may include original and clear ideas about respecting nature, and they may not have needed a word for wilderness. If they need it now, it is our job to teach them. To discuss it, not to preach or inflict. Cultural identity is a fragile thing. Every group wants to maintain it, but they rarely realize how easy it is to lose. Setting cultures aside as museums will not work. Inspiring a care for the wild may bring humanity together once in a while around a common goal, but it should allow each people to find its own way through the problem.

In some places, wilderness will admit the presence and activities of people who have tended the land responsibly for generations. In other places the fragility of the situation might mean that the old ways must go. Each case deserves separate consideration.

No proclamations will make easier the difficult choices minority cultures must face amidst pressures of development and preservation of their inherited lands. There is no easy way to save the wild as well.

Science is not going to save the wilderness. Biodiversity may be very important, and its value may be clearly established by conservation biologists. But it remains a specialized concept. In contrast, the wild is an idea that will be compelling to more of us: It is pure, sensual, dangerous, and alluring. We cannot resist it. Science can only support our love. It will not replace it because its language is more exact.

Economics will not save the wilderness. The wild may need a place in the nations' budgets and expenditures, but it cannot be quantified, and above all it cannot be reduced to dollars and cents. You cannot make enough money on wild places to justify their existence in cost-benefit analyses unless you sincerely bend the rules to put a price tag on the priceless, and attempt to buy what is not for sale: Beauty, purity, survival of the beyond-human right in our midst, reminding us to turn off the running total of calculation in order to truly perceive where we are, and what kind of world it is that we live in.

Management is not going to save the wilderness. It may be practical and possible to draw a line on the map and say: Look, this side is wild and is governed by rules and that side is tame and there you can do what you want. Something is backward there—legislation cannot set boundaries in which wildness is supposed to be confined. True, we have to set up such laws because people seem to need codes to keep us in check. But this is a sad fact of humans not being able to reconcile with nature: We don't on our own fit in. Yet, if we find the wild in these planned-out wildernesses, its presence will be in spite of the rules.

So take us out there, to breathe in the alternative. Even so, experience is not going to save the wilderness. You can go there and love it, or even refuse to come home and instead live there, but its safety will still be in danger. There is so much to do, back home and around the world.

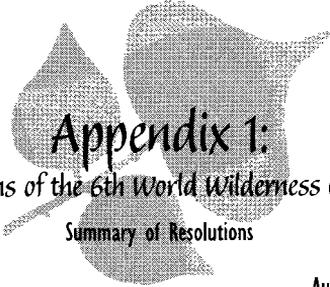
Philosophy is certainly not going to save the wilderness, especially if it only pokes thorns in the sides of everyone else's faiths and arguments. Ideas have throughout history changed the world, but I doubt that they have saved the world. Will humility save it if we just dare to step back and tread lightly but seriously across this planet that is all that we honestly have? Will education save the wild, if we simply teach more and more people to consider, to care? Will poetry save the wild, if we learn to bend language as far as it can go so that it will be its most beautiful? As Swedish poet Tomas Tranströmer writes, "The wild does not have words." We don't have much time. We have to do everything, and nothing, acting always with both passion and care.

Go out there. See what you know. Come back with more. But don't forget to come back. We need all of you somehow, in the midst of this fight. None of these approaches alone will do enough to save the wild, but if they all respect their own limitations and the contributions of other, quite different ways of seeing the wild, then hopefully something can be done. There will be disagreements and incompleteness, but all we can hope is to work together, and although the wild will surely win in the end, perhaps it can include us in the victory as well.

SECTION IX



*Appendices
and
Index*



Appendix 1:
Resolutions of the 6th World Wilderness Congress
 Summary of Resolutions

Title	Author
1. Empowering the ecologically handicapped	DR. DHURBAJYOTI GHOSH
2. Transparency and right to information	MRS. D. S. VARIAVA
3. The future of the tiger in the millenium	MR. M. A. PARTHA SARATHY
4. Education awareness and training for wilderness conservation	DR. ERACH BARUCHA
5. Settlement of rights in PAs in India	MR. ARVIND MISHRA
6. Appreciation of service rendered to 6th WWC	DR. JOHN HENDEE
7. Promotion and protection of the Himalayan Environment	MR. ROBERT PETTIGREW
8. Private conservation areas	MRS. ALMITRA PATEL
9. International funding and wilderness damage	MR. BITTU SAGHAL
10. Public interest environmental law ...	MR. JOB C. HEINTZ
11. Formal recognition of groups promoting wilderness conservation	DR. SHAJU THOMAS
12. Protected areas in the high seas	MRS. MAXINE McCLOSKEY
13. Need for specific legislation on wilderness in Asia	MR. VANCE G. MARTIN
14. Education for sustainable development	MR. VIKAS HARRIS
15. To promote rational PA designation guidelines and standards for new PAs	MS. CAMILLE RICHARD
16. Partnership with wilderness communities	MRS. KUSUM KARNIK
17. Three crises facing humankind	DR. GUNAVANT OZA
18. Encouragement for designation of wilderness areas according to IUCN classification for Republic of Namibia	MR. T. G. COOPER
19. Proposed venue for the 7th WWC (Namibia)	MR. T. G. COOPER
20. Transboundary protected areas/national parks	DR. DANIEL H. HENNING
21. The need for training in techniques and science of wilderness management staff	MR. MICHAEL OLWYLER
22. Support for transfrontier or peace park concept	MR. ROLAND GOETZ
23. The need for an audit for resolutions of previous congresses	MR. WILLIAM BAINBRIDGE
24. Concerning the lack of Russian participation in 6th WWC	DR. GREGORY H. APLET
25. Support of the proclamation of the 1st World Lake Day	MR. ULF DOERNER
26. The Greater St. Lucia Wetland Park, SA	MR. ULF DOERNER
27. Restoring the earth: proposal to the UN	ALAN WATSON FEATHERSTONE
28. Oldest trees of the world as heritage trees	MR. C. T. VAIRAVAN

Resolutions

1. Empowering the Ecologically Handicapped

WHEREAS,

- the wilderness areas that contain natural resources are diverse, some of these resources have a very high or an absolute level of biodiversity both at the local and global level, and have been generally undervalued, disadvantaged and over-harvested, and the people and communities that live in, or close to, these areas and depend on them are described as "ecologically handicapped," and
- the present system of wildlife planning and management which uses a top-down approach to resource management is outdated, rigid, and the various kinds of programs and policies perpetuated in the form of special allowances of established approaches to resource management programs (e.g., game laws, etc.) are disadvantageous to people,

The 6th World Wilderness Congress hereby resolves that:

- all governments, associated organizations, policy processes, concerned for the ecologically handicapped,
- and all participating member organizations, to make the implementation of this policy and local people be involved in every form of planning, design, and implementation of such programs.

Sponsored by:	Dr. D. Saravanan, Director, WWF-INDIA, Government 2, 11/1, N.S.I., Park Road, Chennai 600 017, India	tel: +91 44 261 3612/22754 tel: +91 44 261 37176 e-mail: dms@projectwildlife.org
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2. Transparency and the Right to Information

WHEREAS,

- it finds that impact upon wildlife, forests and human livelihoods in and around such areas is often not known to local communities, and a very large, and
- local communities and NGOs face great difficulties in obtaining information from government authorities,

The 6th World Wilderness Congress hereby resolves that:

- all governments, state legislatures, and other agencies may be necessary to provide full and early access to information on affected areas, and NGOs or local communities.

Sponsored by:	Mrs. D. Saravanan, Director, Biosphere National Program Support Sarang, Post - J. Perambalur Road, Madurai 625 021, India	tel: +91 423 261 2537 tel: +91 423 261 2531
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3. The Future of the Tiger in the Millennium

WHEREAS,

- the tiger *Panthera tigris* is an endangered species, and the Royal Tiger Biosphere is threatened with the prospect of extinction in a not too distant future,

The 6th World Wilderness Congress hereby resolves that:

- management practices should aim at providing favorable and secure habitat, adequate prey base, and effective protection against poaching and poisoning to ensure the survival of the species and thereby protect and preserve the ecosystem and wilderness;
- Project Tiger, which was launched in India in 1973 to save the tiger, now implemented in seventeen tiger reserves, should be extended to other areas, preferably contiguous to the existing tiger reserves, where tigers are found and with potential to be developed as suitable tiger habitats;
- continuance and permanence of tiger reserve areas should be strictly ensured and attempts to divert these areas for other purposes such as mining, major dams, industries, which will lead to reduction and fragmentation of the habitat, should be resisted and prevented; and
- constant monitoring of the project, including periodic censusing of predator and prey species, is essential in order to evaluate the results.

WHEREAS,

realizing that no conservation effort can succeed without the goodwill and cooperation of the people, particularly those residing in the neighborhood of the project areas;

The 6th World Wilderness Congress hereby resolves that:

- payment of compensation for cattle/humans killed by tigers should be adequate and prompt; and
- public (i.e., local communities, NGOs, and media), should be actively involved in conservation issues and projects.

WHEREAS,

scientific research is the backbone of wildlife management and should form an important component in tiger conservation;

The 6th World Wilderness Congress hereby resolves that:

- research on all aspects of tiger conservation should be intensified and may include genetic studies to avoid adverse consequences of inbreeding, prey-predator relationship refining the existing census techniques, and evolving more accurate methods of censusing.

Sponsored by: Mr. M. A. Partha Sarathy
No. 1, 12th Cross
R.M.V. Extension
Bangalore 560080, India

Seconded by: Mr. K. A. Bhoja Shetty
TEL: +91-80-3340400/3346563
E-MAIL: 6wwc@sparrl.com

4. Education Awareness and Training for Wilderness Conservation**WHEREAS,**

the concepts and action program that are necessary to support wilderness are clearly evident;

The 6th World Wilderness Congress hereby resolves that:

- there is an urgent need to integrate the importance of wildlands into formal educational curriculum;
- that governments integrate the wildland concept with issues related to sustainable landscape development into school and college curricula at the global, national, and local levels;
- ensure that wilderness concepts are also communicated through the mass media for generating public awareness; and
- capitalize on youth organizations, which serve as an effective workforce for environmental awareness at the community level.

Sponsored by:	Dr. Bhanu Sankaran Bharati Vidyapeeth Deemed to be University Joshi Centre for Environmental Education & Research Kalyan, Maharashtra. Phone: 022-25611222	e-mail: bhanu@bharati.ac.in tel: 022-25611222 www.bharati.ac.in/india.htm
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5. Settlement of Rights in Protected Areas in India

WHEREAS,

- the massive scale of human displacement and displacement of law, demarcation of law, etc. has been experienced;
- the settlement process in many of the areas affected by the project has been slow and incomplete, thus being experienced difficulties;

The 6th World Wilderness Congress hereby resolves:

- the Government of India should ensure that the rights of the people who have been displaced and whose livelihoods have been affected by the project are protected;
- in the case of protected areas in India, people who have been displaced and compensation has been received, should be given the right to return to their original areas and special opportunities should be given to them in the settlement of their land. The Government should also ensure that the settlement of the people who have been displaced is done in a manner that is sensitive to the socio-cultural and economic conditions of the people and the Wilderness Areas and people who have been displaced.

Sponsored by:	Mr. World Mirror Mishra Nirala Centre Anand Chhatrapati Centre Rajghat, Barshi, Maharashtra	e-mail: worldmirror@gmail.com tel: 020-26614267
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6. Appropriation of Service Ration to Milk BANI

WHEREAS,

The Wildc Wilderness Congress

- the people of rural areas who are poor and who are unable to afford to purchase milk and other essential items;
- their health and development are dependent on the availability of such essential items and that the Government should take steps to provide such items to the people who are poor and who are unable to afford to purchase milk and other essential items;
- there is a need to provide milk and other essential items to the people who are poor and who are unable to afford to purchase milk and other essential items;

The 6th World Wilderness Congress hereby resolves:

- the Government of India should ensure that the people who are poor and who are unable to afford to purchase milk and other essential items should be provided with such items and that the Government should take steps to provide such items to the people who are poor and who are unable to afford to purchase milk and other essential items;
- Mrs. Sangeeta Kulkarni, National Secretary, Wilderness Society, Mumbai, Maharashtra;
- Mrs. Anand Chhatrapati, National Secretary, Wilderness Society, Mumbai, Maharashtra;
- the small and landless people of the World Wilderness Congress, India, and other countries;
- the staff of the Wilderness Society, India, and other countries.

Sponsored by: Dr. John C. Hendee, Director,
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University of Idaho—
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7. Promotion and Protection of the Himalayan Environment

WHEREAS,

the Himalayan landscape represents one of the greatest mountain wildernesses of the world, the Symposium on the Promotion and Protection of the Himalayan Environment considered the issues and,

The 6th World Wilderness Congress hereby endorses:

- the environmental policy of the International Mountaineering and Climbing Federation (UIAA) entitled “Environmental Objectives and Guidelines”;
- the practical environmental guidelines of the British Mountaineering Council entitled “Expedition Environmental Guidelines”; and
- the policy, guidelines, and pledges of the Pacific Asia Travel Association and Green Globe.

Proposed by: Mr. Robert Pettigrew
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Seconded by: Mr. Mandip Singh Soin
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FAX: +44-1332-865969
E-MAIL: 1165@compuserve.com

8. Private Conservation Areas

WHEREAS,

- South Africa permits the ownership and breeding of wildlife in extensive privately owned conservation areas for wildlife-viewing tourism;
- most such private areas are adjacent and to contiguous and protected national parks like Kruger, thus extending the ecosystem area and relieving tourist pressure on the national parks themselves;
- despite the existence of numerous such conservation areas, the income of South Africa’s National Park System has not declined but in fact increased; and
- just one such private conservation area has raised (and sold in breeding prides) 280 African lions in fifteen years, a number equal to the entire population of Indian lions, which has not increased in thirty years;

The 6th World Wilderness Congress hereby requests

that the government of India thoughtfully consider and initiate a public debate to permit the implementation of the proposed amendments based on the New Indian Model of management for the national parks and wildlife sanctuaries and forest reserves to better conserve the rich and precious heritage of the country.

Respectfully,
Mrs. Ananta Patel
Secretary, Wildlife Conservation Society
54, Kothare Naga's Road,
Bangalore 560 077, India

9. International Fluidity and Wilderness Heritage

WHEREAS,

multilateral treaties establishing agreements such as the World Bank Convention on the Protection and Development of Transboundary Aquifers and the United Nations Convention on the Law of the Sea, the Convention on Biological Diversity, the Convention on the Conservation and Sustainable Use of Wetlands, and the Convention on the Protection and Enhancement of the World Cultural Heritage, among others, have been signed;

The 6th World Wilderness Congress hereby requests and calls upon that

- the World Bank and all signatory agencies expedite the finalizing process for the ratification of the treaties listed above, to the extent that they have not done so;
- nations and leading organizations convene as an international organization to negotiate these treaties and to facilitate the international funding agencies and the program governments to develop financial and technical projects;

Respectfully,
Mr. Bela Nigam
Secretary, Ministry
of Environment and Forests
Nirman Tower, Mumbai - 400 022, India

**10. Public Interest Environmental Litigation
Essential to the Call for a Sustainable Future**

WHEREAS,

- public interest litigation is a necessary component of environmental protection, and a critical element of environmental policy-making and other (NAG) (NAG) activities;
- among the many public law emerging as a result of the right to life, health and personal liberty, environmental litigation is a distinct instrument, which supports the welfare of the citizens of the country, and
- even in the absence of direct litigation, the fundamental rights of the citizens are being violated, as the environmental laws of the country are not being strictly enforced and the citizens are being made aware of their fundamental rights and
- public interest litigation is a necessary component of the environment and natural resources and
- legal action is a necessary component of the environment and natural resources and

WHEREAS,

public interest litigation is a necessary component of the environment and natural resources and

The 6th World Wilderness Congress hereby resolves that:

it encourage the continuing efforts of public interest legal advocates (including, but not limited to: Forum for Protection of Public Interest, Nepal; Consumer Protection Group, Madras; Environmental Support Group, Bangalore), **nongovernmental organizations** (including, but not limited to: National Tree Growers' Co-Operative Federation, Munsiri, Uttar Pradesh; The Greens, Assam; Indian Society for Environmental Studies, Bangalore; Environmental Education Centre, Maharashtra), **and appropriate support from all relevant government entities.**

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11. Formal Recognition of Groups Promoting Wilderness Conservation

WHEREAS,

numerous entities have dedicated time, energy, and political will throughout the world;

The 6th World Wilderness Congress hereby resolves that:

governments, NGOs, INGOs, and local communities receive formal recognition for the work they have accomplished in wildlands and wilderness protection.

Examples expressed include:

- the Bishnoi Community of India
- Italian Wilderness Society and Italian Municipalities

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12. Protected Areas in the High Seas

WHEREAS,

- the oceans and seas cover some 70 percent of this planet;
- coastal nations have established a number of marine protected areas within their waters of national jurisdiction, the world community of nations has yet to establish an international system of protected areas on the high seas;
- there is no international agency with clear authority to establish, manage, monitor, and enforce such a system on the high seas;
- there are many values in the high seas that justify protection;
- there are significant threats to the biological and physical features of the high seas;
- little is known about the features and systems of the high seas;
- the 4th and 5th World Wilderness Congresses adopted resolutions emphasizing the need for protected areas in marine waters, and accepting the idea that wilderness is an appropriate designation in the marine environment;

- the UN World Commission on Environment and Development (WCED) was created in 1983 and
- the Global Change Programme (GCP) was established in 1985 to coordinate research on climate and other environmental issues of the Global Change Programme.

The 6th World Wilderness Congress, Toronto, Ontario, 1984

- resulted in the important findings of the 1984 report, *Conserving and Managing Wilderness Areas on the Edge of Civilization*, and also the *Wilderness Declaration*.
- a landmarked global wilderness programme was being initiated with the first annual International Congress on Wilderness Conservation and Management in 1985 in the USA.
- an energy research programme was initiated in the USA in 1985.
- an international network of the World Wilderness Commission was set up with the first meeting held in 1986 and to be appropriate to the 1980s.

Sponsor(s)	Mr Wayne M. Jones Wildlife Society of Canada, Wilderness Society America, IAU, IUCN, etc.	Secretary: Dr J. S. Squire 1140 - 17th Ave. Calgary, Alberta, T2M 1P4 Canada, 403-243-1111
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15. National Legislation on Wilderness Policy

WILDERIAS

- wilderness was defined as 'an area of land which is so natural as to be unmodified or nearly unmodified by human activities and which is so wild as to be uncontrolled by human beings in any way'.
- these areas and the values they contain are of great importance to the world.
- wilderness is a natural resource which is irreplaceable, and which is being destroyed at an alarming rate. It is a natural resource which is being destroyed at an alarming rate, and which is being destroyed at an alarming rate.
- many years of experience in wilderness conservation have shown that wilderness areas need special management and protection, particularly in regard to wilderness values and in particular to the management of wilderness areas.

The 6th World Wilderness Congress, Toronto, Ontario

results have been as follows:

- quick response to the need to establish a global wilderness network and to coordinate wilderness activities.
- review of national legislation in wilderness conservation and wilderness management in 1984 and 1985.
- production of a code of wilderness management for the IAU, IUCN, and other organizations and individuals for the protection of wilderness areas and for the protection of wilderness areas.
- complete programme of wilderness research and education in wilderness management and wilderness conservation.
- special programme for WWF, 1984.
- approval of a code of wilderness management and wilderness conservation and wilderness management and wilderness conservation.

Sponsor(s)	Mr Victor G. Martin The World Wilderness Foundation, 139 Highway 90, St. John's, N.S.	Secretary: Dr. J. S. Squire 1140 - 17th Ave. Calgary, Alberta, T2M 1P4 Canada, 403-243-1111
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14. Education for Sustainable Development

WHEREAS,

programs relating to conservation education should take into account, wherever possible, local traditions, faiths, and cultural practices that have contributed to nature conservation;

The 6th World Wilderness Congress hereby resolves that:

education programs may reemphasize the value systems that have contributed to protecting nature with a sense of respect and reverence.

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15. To Promote Rational Protected Area (PA) Designation Guidelines and Standards for Reclassifying Current PAs and Delineating New PAs

WHEREAS,

- many wildland areas currently exist that are not under some form of formal protection (although maybe under community protection); and
- most of these areas experience some degree of human presence, from permanent habitations with associated agriculture to seasonal nonpermanent use such as grazing;
- these areas can be designated under various classes of "wildland" to accommodate customary use rights, along with community development schemes that, over time, reduce pressure on PA resources; and
- in many developing countries, strict PA designations have been made where people have long-standing customary and legal rights, requiring eviction and settlement of rights, potentially resulting in serious socioeconomic loss to local communities;

The 6th World Wilderness Congress hereby resolves that:

- governments adopt a designation process that provides socially just compensation, where necessary, both to reclassify currently existing PAs and delineate new ones;
- the WWC promote the formation of a committee to draft general guidelines and standards for delineating (and reclassifying) PAs under various categories as defined by IUCN (of which wilderness is only one) that considers:
 - varying degrees of "wilderness,"
 - customary use rights,
 - degree of dependence on PA resources, and
- IUCN incorporates these guidelines into their definitions of PA categories.

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16. Partnership with Indigenous Communities

WHEREAS,

in order to meet the needs of indigenous peoples, a national and regional committee on indigenous women and women's organizations and their global network of organizations and networks of women's organizations should be established to address the needs of indigenous women's organizations;

WHEREAS,

in order to promote indigenous women's organizations and their global network of organizations, a partnership should be developed with these organizations;

The 6th World Women's Congress hereby resolves that:

in order to support the indigenous women's organizations and implement through a network of such organizations and committees a programme of cooperation, and to assist in the organization and development of such indigenous women's organizations, the participants and the committee members of the present Congress should initiate a process whereby several methods concerning the organization and development of indigenous women's organizations will be developed and implemented, and should be made available to all indigenous women's organizations worldwide.

Sponsored by
Mrs. K. C. Kariuki
SHS/PAW
A/1973/Map/19
P.O. Box 1973/1973

U.N. Doc. E/1973/23/Rev.1
Annex, para. 27 (11-20/73)

17. Threats to the Future of Humankind

WHEREAS,

we face a global crisis brought about by global and regional imbalances, and by the gap between rich and poor nations that we shall not be able to overcome unless we act immediately;

The 6th World Women's Congress hereby resolves that:

1. that a global effort has been initiated to assess and to deal with the world's environmental crisis, and urges the decision-makers in the United Nations and elsewhere to draw immediate attention to the global environmental crisis that will be a direct result of the global environmental crisis and to take effective measures to deal with the crisis;
2. that particular attention should be given to the needs of the most vulnerable populations, particularly the needs of the world's less developed countries, in order to meet the global environmental crisis.

Sponsored by
Dr. Hans-Joachim
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New Delhi 110001, India

U.N. Doc. E/1973/23/Rev.1
Annex, para. 28 (11-20/73)

18. *Encouragement for Designation of Wilderness Areas According to IUCN Classification, within the New Environmental Act Covering Natural Resources as Intended by the Republic of Namibia*

WHEREAS,

the attendees at the 6th WWC, noting the progress made in Namibia in Wilderness issues—awareness, training, trails, and protection; and wishing to show solidarity and support to the government and people of Namibia, and to extend acclaim for that country's progress, which sets an example to the world and the African continent; but realizing that the only realistic and meaningful protection of wilderness lies in legal entrenchment at the highest level of government, and not merely in administrative zoning;

The 6th World Wilderness Congress hereby resolves that:

- the government and people of Namibia be congratulated for their increasing understanding and support for wilderness;
- every encouragement be extended to the government of the Republic of Namibia and the Ministry of Environment and Tourism, in the formulation of the relevant new act, to pursue the inclusion of the IUCN standards relating to protected area categories, in particular, category 1, which caters to the inclusion and recognition of wilderness areas.

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Waterberg, Namibia

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19. *Proposed Venue for the 7th World Wilderness Congress*

WHEREAS,

attendees and delegates at the 6th WWC, wishing to confirm the venue for the next congress, and having decided that this should take place in the southern winter of the year 2001 or 2002 in southern Africa, in order to coincide with the twenty-fifth anniversary of the 1st WWC; and noting the progress made in Namibia in environmental affairs and in particular those relating to wilderness issues, but including also the related fields of environmental education, sustainable utilization, park management, and community-based resource management; and wishing that wilderness issues be expanded into the rest of the African continent; while noting also the logistical capabilities and expertise available for holding such a conference in Namibia;

The 6th World Wilderness Congress hereby resolves that:

- The Republic of Namibia is considered as the venue of the 7th WWC; and
- accordingly, the government and people of Namibia are requested to host the 7th World Wilderness Congress within that country.

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20. Transboundary Protected Areas/National Parks

WHEREAS,

- people have divided the earth into national territories and territories of those countries state at all times border with another nation;
- these national boundaries have, up to 1900, been generally and have high boundaries so-called "topography" as well as high wilderness areas;
- about 35 percent of these high wilderness areas still exist in a "pristine natural" condition;
- 20,000,000,000 people live in a country of 5 percent of the global population;
- according to protected areas a country with a number of about 100,000 people has only one government authority with some degree of autonomy.

(According to Dr. Arthur J. Worthing)

WHEREAS,

The 6th World Wilderness Congress recognized a need that transboundary protected areas national parks and national parks be recognized:

- enhance the environmental resources of countries by the more effective management of shared resources, such as watersheds;
- have effective environmental management of resources transboundary, such as the 10,000 km² of species throughout the world;
- economic development, such as the creation of national parks, communal parks, and national parks;
- better for the cooperation between countries, especially through the use of national parks and national parks of 10-20 km².

WHEREAS,

Agreements for transboundary cooperation are being signed up, and the World Bank and other international organizations are contributing to a need to support that transboundary parks be protected in the

WHEREAS,

transboundary protected areas national parks are those areas where there is an interdependence existing in various ways between the human world and

The 6th World Wilderness Congress hereby (generally) resolves that

its members consider the ways and means of furthering international, national, private, and local cooperation toward the maintenance, management, protection, and development of transboundary parks and national parks, and the necessary measures to carry them out.

The 6th World Wilderness Congress hereby (specifically) resolves to

support the transboundary cooperation and a world network reported in the following: Thailand, Laos, and China's which is made the majority of a transboundary park named to be national parks and a park of the national parks of Cambodia, Laos, Vietnam, and Myanmar; and the Transboundary Myan, Transboundary Borneo, and other to the governments of Laos, Vietnam, and Myanmar; and Myanmar transboundary parks and national parks of Cambodia, Laos, and Myanmar.

The 6th World Wilderness Congress hereby also resolves that

consideration be given to the establishment of transboundary parks and national parks between India and Pakistan

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21. The Need for Training in the Techniques and Science of Wilderness Management for Management Staff, and Others with a Specific Interest in Wilderness Conservation

WHEREAS,

it is of critical importance that staff members of official organizations, who have responsibility to achieve the authorized management goals and objectives for the wilderness for which they are responsible, are adequately equipped to undertake their duties.

WHEREAS,

it is acknowledged that a substantial number of field staff members have not received adequate training in the basic tenets of wilderness conservation, or of the forms of field management that are appropriate in a designated wilderness;

The 6th World Wilderness Congress hereby resolves to:

support initiatives to provide appropriate training and awareness programs for management staff who are involved in the management of wilderness areas, for the purpose of empowering them to achieve the goals and objectives for each of the wildernesses for which they are responsible; and calls on agencies, donor organizations, and other interested organizations to support initiatives, such as the Manager to Manager Program: Field Based Training for Protected Area Workers Around the Globe of the USDA Forest Service of the United States of America; and the Wilderness Management Training Courses of the Wilderness Action Group of southern Africa.

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22. Support for the Transfrontier or Peace Park Concept

WHEREAS,

strong support for the transfrontier or peace park concept has been registered at this congress.

WHEREAS,

Rotary International was the initiator of the peace park concept, some sixty-five years ago, in bringing Canada and the United States of America together to establish the Waterton-Glacier Peace Park;

The 6th World Wilderness Congress hereby resolves to:

urge Rotary International to use its influence and its resources to facilitate transfrontier initiatives globally, currently underway, that have received the support of this congress, such as the India-Pakistani Kashmere Peace Park; the Emerald Triangle Peace Park between Cambodia, Laos, Vietnam, and Myanmar; and the Dakensberg-Maloti Peace Park between Lesotho and South Africa.

- | | | |
|-----------|--|--|
| Sponsors: | Mr. Richard L. Coe
MNMN Heritage Society
PO Box 2111
Ellensburg, WA
Northwest Science Center | Sponsored by: Mr. Richard Coe
PO Box 2111
Ellensburg, WA 98926
Northwest Science Center |
|-----------|--|--|

23. The Need for an Audit of the Reservations of Deceased Congresses

WHEREAS,

each of the World Wilderness Congresses, including the present one, conducted a thorough audit of its assets of which the most important categories were the debt, the reservation of the land, the title, the status of the deed, the status of the construction plans of the World Wilderness Society, the status of the property and the status of the title, the present and past delinquencies.

The 6th World Wilderness Congress hereby resolves to

- require the congress organizers to undertake an audit of the reservation of the land, the status of the deed, the status of the construction plans, the status of the title, the status of the deed, the status of the construction plans, the status of the property and the status of the title, the present and past delinquencies.
- require the organizers to report the results of the audit to the members of the congress of the World Wilderness Congress.

- | | | |
|-----------|--|--|
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National River Service
New Alexandria, BC
Blenheim, P.O. Box 100 | Sponsored by: Mr. Richard Coe
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|-----------|--|--|

24. Concerning the Lack of Respect for the Rights of the 6th WWC

WHEREAS,

the 6th World Wilderness Congress, which was held in 1997, was the last of the series of World Wilderness Congresses, which were held in 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 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2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 2681, 2682, 2683, 2684, 2685, 2686, 2687, 2688, 2689, 2690, 2691, 2692, 2693, 2694, 2695, 2696, 2697, 2698, 2699, 2700, 2701, 2702, 2703, 2704, 2705, 2706, 2707, 2708, 2709, 2710, 2711, 2712, 2713, 2714, 2715, 2716, 2717, 2718, 2719, 2720, 2721, 2722, 2723, 2724, 2725, 2726, 2727, 2728, 2729, 2730, 2731, 2732, 2733, 2734, 2735, 2736, 2737, 2738, 2739, 2740, 2741, 2742, 2743, 2744, 2745, 2746, 2747, 2748, 2749, 2750, 2751, 2752, 2753, 2754, 2755, 2756, 2757, 2758, 2759, 2760, 2761, 2762, 2763, 2764, 2765, 2766, 2767, 2768, 2769, 2770, 2771, 2772, 2773, 2774, 2775, 2776, 2777, 2778, 2779, 2780, 2781, 2782, 2783, 2784, 2785, 2786, 2787, 2788, 2789, 2790, 2791, 2792, 2793, 2794, 2795, 2796, 2797, 2798, 2799, 2800, 2801, 2802, 2803, 2804, 2805, 2806, 2807, 2808, 2809, 2810, 2811, 2812, 2813, 2814, 2815, 2816, 2817, 2818, 2819, 2820, 2821, 2822, 2823, 2824, 2825, 2826, 2827, 2828, 2829, 2830, 2831, 2832, 2833, 2834, 2835, 2836, 2837, 2838, 2839, 2840, 2841, 2842, 2843, 2844, 2845, 2846, 2847, 2848, 2849, 2850, 2851, 2852, 2853, 2854, 2855, 2856, 2857, 2858, 2859, 2860, 2861, 2862, 2863, 2864, 2865, 2866, 2867, 2868, 2869, 2870, 2871, 2872, 2873, 2874, 2875, 2876, 2877, 2878, 2879, 2880, 2881, 2882, 2883, 2884, 2885, 2886, 2887, 2888, 2889, 2890, 2891, 2892, 2893, 2894, 2895, 2896, 2897, 2898, 2899, 2900, 2901, 2902, 2903, 2904, 2905, 2906, 2907, 2908, 2909, 2910, 2911, 2912, 2913, 2914, 2915, 2916, 2917, 2918, 2919, 2920, 2921, 2922, 2923, 2924, 2925, 2926, 2927, 2928, 2929, 2930, 2931, 2932, 2933, 2934, 2935, 2936, 2937, 2938, 2939, 2940, 2941, 2942, 2943, 2944, 2945, 2946, 2947, 2948, 2949, 2950, 2951, 2952, 2953, 2954, 2955, 2956, 2957, 2958, 2959, 2960, 2961, 2962, 2963, 2964, 2965, 2966, 2967, 2968, 2969, 2970, 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3137, 3138, 3139, 3140, 3141, 3142, 3143, 3144, 3145, 3146, 3147, 3148, 3149, 3150, 3151, 3152, 3153, 3154, 3155, 3156, 3157, 3158, 3159, 3160, 3161, 3162, 3163, 3164, 3165, 3166, 3167, 3168, 3169, 3170, 3171, 3172, 3173, 3174, 3175, 3176, 3177, 3178, 3179, 3180, 3181, 3182, 3183, 3184, 3185, 3186, 3187, 3188, 3189, 3190, 3191, 3192, 3193, 3194, 3195, 3196, 3197, 3198, 3199, 3200, 3201, 3202, 3203, 3204, 3205, 3206, 3207, 3208, 3209, 3210, 3211, 3212, 3213, 3214, 3215, 3216, 3217, 3218, 3219, 3220, 3221, 3222, 3223, 3224, 3225, 3226, 3227, 3228, 3229, 3230, 3231, 3232, 3233, 3234, 3235, 3236, 3237, 3238, 3239, 3240, 3241, 3242, 3243, 3244, 3245, 3246, 3247, 3248, 3249, 3250, 3251, 3252, 3253, 3254, 3255, 3256, 3257, 3258, 3259, 3260, 3261, 3262, 3263, 3264, 3265, 3266, 3267, 3268, 3269, 3270, 3271, 3272, 3273, 3274, 3275, 3276, 3277, 3278, 3279, 3280, 3281, 3282, 3283, 3284, 3285, 3286, 3287, 3288, 3289, 3290, 3291, 3292, 3293, 3294, 3295, 3296, 3297, 3298, 3299, 3300, 3301, 3302, 3303, 3304, 3305, 3306, 3307, 3308, 3309, 3310, 3311, 3312, 3313, 3314, 3315, 3316, 3317, 3318, 3319, 3320, 3321, 3322, 3323, 3324, 3325, 3326, 3327, 3328, 3329, 3330, 3331, 3332, 3333, 3334, 3335, 3336, 3337, 3338, 3339, 3340, 3341, 3342, 3343, 3344, 3345, 3346, 3347, 3348, 3349, 3350, 3351, 3352, 3353, 3354, 3355, 3356, 3357, 3358, 3359, 3360, 3361, 3362, 3363, 3364, 3365, 3366, 3367, 3368, 3369, 3370, 3371, 3372, 3373, 3374, 3375, 3376, 3377, 3378, 3379, 3380, 3381, 3382, 3383, 3384, 3385, 3386, 3387, 3388, 3389, 3390, 3391, 3392, 3393, 3394, 3395, 3396, 3397, 3398, 3399, 3400, 3401, 3402, 3403, 3404, 3405, 3406, 3407, 3408, 3409, 3410, 3411, 3412, 3413, 3414, 3415, 3416, 3417, 3418, 3419, 3420, 3421, 3422, 3423, 3424, 3425, 3426, 3427, 3428, 3429, 3430, 3431, 3432, 3433, 3434, 3435, 3436, 3437, 3438, 3439, 3440, 3441, 3442, 3443, 3444, 3445, 3446, 3447, 3448, 3449, 3450, 3451, 3452, 3453, 3454, 3455, 3456, 3457, 3458, 3459, 3460, 3461, 3462, 3463, 3464, 3465, 3466, 3467, 3468, 3469, 3470, 3471, 3472, 3473, 3474, 3475, 3476, 3477, 3478, 3479, 3480, 3481, 3482, 3483, 3484, 3485, 3486, 3487, 3488, 3489, 3490, 3491, 3492, 3493, 3494, 3495, 3496, 3497, 3498, 3499, 3500, 3501, 3502, 3503, 3504, 3505, 3506, 3507, 3508, 3509, 3510, 3511, 3512, 3513, 3514, 3515, 3516, 3517, 3518, 3519, 3520, 3521, 3522, 3523, 3524, 3525, 3526, 3527, 3528, 3529, 3530, 3531, 3532, 3533, 3534, 3535, 3536, 3537, 3538, 3539, 3540, 3541, 3542, 3543, 3544, 3545, 3546, 3547, 3548, 3549, 3550, 3551, 3552, 3553, 3554, 3555, 3556, 3557, 3558, 3559, 3560, 3561, 3562, 3563, 3564, 3565, 3566, 3567, 3568, 3569, 3570, 3571, 3572, 3573, 3574, 3575, 3576, 3577, 3578, 3579, 3580, 3581, 3582, 3583, 3584, 3585, 3586, 3587, 3588, 3589, 3590, 3591, 3592, 3593, 3594, 3595, 3596, 3597, 3598, 3599, 3600, 3601, 3602, 3603, 3604, 3605, 3606, 3607, 3608, 3609, 3610, 3611, 3612, 3613, 3614, 3615, 3616, 3617, 3618, 3619, 3620, 3621, 3622, 3623, 3624, 3625, 3626, 3627, 3628, 3629, 3630, 3631, 3632, 3633, 3634, 3635, 3636, 3637, 3638, 3639, 3640, 3641, 3642, 3643, 3644, 3645, 3646, 3647, 3648, 3649, 3650, 3651, 3652, 3653, 3654, 3655, 3656, 3657, 3658, 3659, 3660, 3661, 3662, 3663, 3664, 3665, 3666, 3667, 3668, 3669, 3670, 3671, 3672, 3673, 3674, 3675, 3676, 3677, 3678, 3679, 3680, 3681, 3682, 3683, 3684, 3685, 3686, 3687, 3688, 3689, 3690, 3691, 3692, 3693, 3694, 3695, 3696, 3697, 3698, 3699, 3700, 3701, 3702, 3703, 3704, 3705, 3706, 3707, 3708, 3709, 3710, 3711, 3712, 3713, 3714, 3715, 3716, 3717, 3718, 3719, 3720, 3721, 3722, 3723, 3724, 3725, 3726, 3727, 3728, 3729, 3730, 3731, 3732, 3733, 3734, 3735, 3736, 3737, 3738, 3739, 3740, 3741, 3742, 3743, 3744, 3745, 3746, 3747, 3748, 3749, 3750, 3751, 3752, 3753, 3754, 3755, 3756, 3757, 3758, 3759, 3760, 3761, 3762, 3763, 3764, 3765, 3766, 3767, 3768, 3769, 3770, 3771, 3772, 3773, 3774, 3775, 3776, 3777, 3778, 3779, 3780, 3781, 3782, 3783, 3784, 3785, 3786, 3787, 3788, 3789, 3790, 3791, 3792, 3793, 3794, 3795, 3796, 3797, 3798, 3799, 3800, 3801, 3802, 3803, 3804, 3805, 3806, 3807, 3808, 3809, 3810, 3811, 3812, 3813, 3814, 3815, 3816, 3817, 3818, 3819, 3820, 3821, 3822, 3823, 3824, 3825, 3826, 3827, 3828, 3829, 3830, 3831, 3832, 3833, 3834, 3835, 3836, 3837, 3838, 3839, 3840, 3841, 3842, 3843, 3844, 3845, 3846, 3847, 3848, 3849, 3850, 3851, 3852, 3853, 3854, 3855, 3856, 3857, 3858, 3859, 3860, 3861, 3862, 3863, 3864, 3865, 3866, 3867, 3868, 3869, 3870, 3871, 3872, 3873, 3874, 3875, 3876, 3877, 3878, 3879, 3880, 3881, 3882, 3883, 3884, 3885, 3886, 3887, 3888, 3889, 3890, 3891, 3892, 3893, 3894, 3895, 3896, 3897, 3898, 3899, 3900, 3901, 3902, 3903, 39

- The importance of lake systems and wetlands has been recognized. See the Ramsar Convention of 1971 (UNEP).
- Lake systems and wetlands are among the natural resources that are being pumped and impacted upon by increasing extraction of and degradation of resources, extraction of fresh water between national resources, and foreign.
- The pollution of water receives particular attention in the 1972 Stockholm Convention.
- The United Nations Fund has initiated the preservation of the 100 World Case Studies of Wetlands by November 15, 1976 under the 100 Lakes Program. A network of case studies wetlands that are of international importance.

The 100 World Wilderness Congress hereby resolves that:

- the preservation of the 100 World Case Studies of November 15, 1976, is supported and it shall be an annual event to enhance the awareness of the importance of preserving the integrity of lake systems and wetlands, rivers and streams.
- the creation of a network of lakes and wetlands such as the initiation of the 100 Lakes Program under the United Nations Fund as well as such provides a forum for a wide cooperation to address issues related to the sustainability of these areas.

Approved by:	Mr. Ulf Dietrich President and Scientific Advisor to the Wetlands Institute, Nuremberg South Africa Chapter Laf. Friedl, 10, Lank. 44, Immenstaedt Munich, D-9000, Germany	Submitted to: Dr. S. J. Rao, Director, Wetlands Institute P.O. Box 89, 602 002 Chennai, India E-mail: raosj@rediffmail.com , raosj@rediffmail.com
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26. The Greater St. Lucia Wetland Park (SLP)

A Biosphere or International Importance

WHEREAS

- St. Lucia, South Africa is Africa's wetland reserve - 1975
- St. Lucia is a Ramsar Site and South Africa's designated World Heritage Site.
- St. Lucia is the home of some 330 rare species of plants, birds and dangerous species of butterflies - a larger number than of the Okavango and Ngorongoro wetlands.
- St. Lucia has been under constant pressure to various natural parks, such as mining of its natural sites for uranium.
- St. Lucia is a special tourist attraction as an integral part.
- The WWF has initiated the Ivory Care Campaign, which has produced a reference document describing some of the world's most important biospheres and the work that a park needs to succeed.

The 100 World Wilderness Congress hereby resolves that:

- the Greater St. Lucia Wetland Park is to be included in WWF reference document, giving it a place in the world's most important biospheres.
- the South African government is to be congratulated for having become a signatory of UNEP's World Heritage Convention and having designated St. Lucia a World Heritage Site, and
- the South African government is to be encouraged to take the necessary steps to preserve the natural integrity of its wetland areas in the region of the Plover Lake forest.

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27. Restoring the Earth: Proposal to the UN

WHEREAS,

- Ecosystems everywhere are being degraded, fragmented, and disturbed, with many species being driven to extinction, or their populations reduced to a tiny percentage of their original size, and the capacity of the world to support humans is also being seriously impaired in many areas;
- recent research in the United States and elsewhere has shown that existing wilderness and other protected areas are inadequate to support viable populations of the full range of their constituent species;
- restoration of degraded ecosystems is essential to both increase the area of wilderness on the planet and provide the necessary ecological services that are essential for a sustainable future for humanity;
- restoration projects, mainly small-scale initiatives established by concerned local groups and individuals, are underway in many countries and ecosystem types around the world;
- these pioneering projects are helping to elucidate the principles and techniques of ecological restoration, which will need to be applied on a coordinated global scale in the coming decades to return our planet, and all its ecosystems, to a state of health again;
- ecosystem restoration must become an international priority, with substantial resources allocated to it, to ensure its success; and
- with many people's attention increasingly focused on the year 2000, the arrival of the new millennium provides an ideal opportunity for the peoples and nations of the world to unite in humanity's first globally shared task—the restoration of the earth;

The 6th World Wilderness Congress hereby resolves that:

- the General Assembly of the United Nations be called upon, at its meeting in late 1999, to declare the twenty-first century as the Century of Restoring the Earth (in the same way it declared, for example, 1986 to be the International Year of Peace); this will provide an inspiring, positive start to the new millennium, countering the generally negative perceptions of the future prospects for our planet; and
- the United Nations be called upon to establish the appropriate incentives and mechanisms to ensure that restoration based on ecological principles becomes the priority activity for every nation. Such incentives and mechanisms are to include:
 1. every UN member state is requested to redirect 10 percent of its annual military budget, either in cash or in kind (through the use of military resources and personnel) to ecological restoration work. This will give a new sense of value and fulfillment to the military as they engage in resolving the real threats of ecological security;
 2. the establishment of the Earth Restoration Service, which will engage volunteers of all ages in essential restoration work around the world; and
 3. the establishment of an international database and network of existing restoration projects to collate exchange and make publicly available information about successful restoration techniques and initiatives.

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28. Oldest Trees of the World to Be Preserved as World Heritage Trees

WHEREAS,

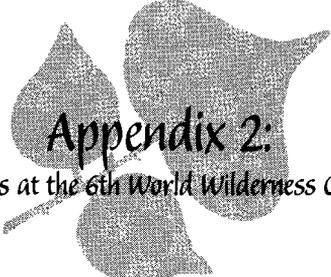
all six days of the program of the 6th WWC focused mainly on fauna and rarely was any conscious effort made to focus on flora, especially trees—and in particular, ancient trees, though they are very few in number;

The 6th World Wilderness Congress hereby resolves that:

sites that harbor ancient trees and their natural habitat be identified, and these areas be protected to maintain and promote their natural character.

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Appendix 2:
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- Abdul, Jasmi bin, 91
agriculture, 40–41
 sustainability, 29
animal rights, 277–284
Asia, *see also* individual countries
 ecological zones, 83
 exploitation of, 84–85
 sustainable food security, 83–89
atmospheric CO₂ concentrations, 4
Australian National Wilderness Inventory, 15–17
- Bainbridge, William R., 134
Barbee, Robert D., 157
Bharucha, Erach, 215
Biligiri Rangaswamy Temple Wildlife Sanctuary (India), 169–171
biodiversity, 1–30 (Section I), 49, 64, 72
Bista, Rabi Bahadur, 99
Buddhism, *see* spirituality
- Cartesian philosophy, 47
colonization, 47–48, 61, 117–118
conservation, as a concept, 55–56
Conservation International (CI), 15
 Center for Applied Biodiversity Science of CI, 19
consumerism, 46, 49
Convention for the Conservation of Biological Diversity, 4
Convention on Biological Diversity (UNCED), 56, 103, 105
Convention on International Trade in Endangered Species of Wild Flora and Fauna
 (CITES), 27, 30, 105
Cooper, Trygve G., 128
- Damu, T., 224
Darwin, Charles, 60, 62

de Alwis, Lyn, 115
 de Rothschild, Edmund, x
 Doerner, Ulf, 207

Earth Day, 189

Earth Restoration Corps (ERC), 188–190

ecological restoration, 167–190 (Section IV), 215–223

ecologically handicapped, 40–43

ecosystems, 5–8, 40, 44

management strategies, 8–11

ecotourism, 27–28

environmental education, 42

environmental responsibility, corporate, 215–256 (Section VI)

biodiversity, case study (India), 224–228

ecorestitution in India, 215–223

in cocoa production, 249–256

industrial ecology, 239–245

global movements in, 234–238

management strategies, 232–233

peri-urban setting (South Africa), 229–233

environmental responsibility, personal, ix–xi

environmentalism, 42

ethics

animal rights, 277–284

exploitation, *see* Wilderness, exploitation

Featherstone, Alan Watson, 183

Food and Agricultural Organization (FOA), 57, 64, 65

forest assessment, 57

Forestry Project, 48

forests, 57–59

Fox, Michael W., 172

gender and wilderness, 33–35

Ghandi, Mahatma, ix

Ghosh, Dhruvajyoti, 40

Gir Lion Wildlife Sanctuary Project, 75, 77

Gir lion, 75–82

global wilderness law, xvi–xix

IUCN Framework of Protected Areas, xv, xvi–xvii

Goetz, Roland, 229

Griffith, John D., 172

- Hannah, Lee, 14
 Hartke, Vance, 188
 Hempton, Gordan, x
 Hendee, John C., 267
 Humane Society International (HSI), 26–30
 Humane Society of the United States (HSUS), 26–30
 Hutanuwatr, Pracha, 259
- India
 Biligiri Rangaswamy Temple Wildlife Sanctuary, 169–171
 colonization, 173–174
 condition of wilderness, 60–70
 conservation, 55–56
 ecological infrastructure, 69–70
 forests, 57–59
 Gir lion, 75–82
 legislation, 71–74
 wildlife interactions, 172–182
 indigenous people, 5, 71
 in India, 36–39, 44–45, 49, 67–68, 169–171, 173
 in the United States, 157, 159, 163
 International Whaling Commission, 30
 International Wilderness Leadership (WILD) Foundation, xiii, 146
 Irwin, Paul G., 26
 Italy, 144–147
- Jain, Devaki, 33
 Jung, Carl G., x
- Kaye, Roger W., 160
 Kenya, 122–127
 management of wildlife resources, 125–127
 population trends, 123
 poverty and conservationism, 123–124, 125
 socioeconomic situation, 123–124, civil strife, 124–125
- Key, Sandra, 151
 Khan, Shri. Khurshed Alam, 53
 Konkar, Ranjit, 277
 Kreher, Nora, x
 Kroll, Herbert F., 234
 Kurth, James W., 160
 Kutty, Krishnan, x

- Living Lakes Project, 207–212
 living machines, *see* environmental responsibility, corporate, industrial ecology
 low-desire-level (LDL), 44, 49
 Lusigi, Walter J., 122
- Malaysia, 90–98
 marine environment, 193–197
 Martin, Vance, vii, x, xiii, 146
 McCloskey, Michael, x, 20
 Miller, Kenton R., 3
 mismanagement of resources *see* wilderness, exploitation
 Muir, Andrew, 264
 Murali, K. S., 169
 Myer's Hotspot analysis, 14, 15, 17, 18
- Namibia, 128–133
 National Wilderness Preservation System (NWPS), 154–156
 Natural Map of the World, 14–15
 Nepal, 99–114
 land use, 105–106
 legislation, 103–105
 protected areas, 101–103
 New Zealand, 149–150
 Nilgiri Hills, 36
- Okavango Delta, 198–206
Origin of Species (1859), 60
- philosophy, 275–291
 see also, spirituality
 Player, Ian, ix
 Prabhu, Shri. Suresh, 55
 protected areas *see also*, wilderness, protected areas
 categories, 12
 definition, 12
- Rai, Shobha Nath, 57
 Reedy, Murray C., 149
 responsibility-corporate, personal, ix–xi
 Riley, Marilyn Foster, 267
 rivers, 20–25
 Ross, Karen, 198
 Rothenberg, David, 286

- Sahgal, Bittu, 60
 Sarathay, Partha, viii, x, xiii, 33
 Satheesan, S. M., 71
 Setty, R. Siddappa, 169
 Siam (Thailand), 259–263
 Shaw, Michael, 239
 Sierra Club, 20
 Silver, Sasha, 246
 Singh, H. S., 75
 Singh, Samar, 71
 South Africa, 134–143
 assessment, 137–138
 Imbewu Program, 264–266
 legislation, 142
 protected areas, 134–136, 138–139
 spirituality, 285, 259–263
 Buddhism, 115, 259–263
 Sri Lanka, 115–121
 Stokes, Gerald L., 154
 Strong, Hanne, 188
 Sudarshan, H., 169
 Sweatman, Michael, x
- Teertha, Swamiji Vibudhesha, 285
- United Nations
 Commission for Sustainable Development, 29
 Convention on Environment and Development (1992), 134, 153
 Development Program (UNDP), 64, 65
 Environment Program, 20
 Human Development Report (UNDP), 34
- United States, 151–165
 Alaska Wilderness, 157–159
 Arctic National Wildlife Refuge, 160–165
 Forest Service (USFS), 153, 154
 legislation, 155–156, 158–159, 164
 wilderness preservation system, 154–159
- van der Post, Laurens, xi
 Veeresh, G. K., 83
 vision quests, 267–274

- WILD Foundation, *see* International Wilderness Leadership (WILD) Foundation
- wilderness
- and agriculture, 40–41
 - as a protected area, 51–165 (Section III)
 - assessments, 14–19
 - defined, 71
 - exploitation, 41, 60–70
 - restoration, 183–187
 - strategies for sustainability, 26–30
- wilderness, marine, 191–212 (Section V)
- environment of, 193–194
 - Living Lakes Project, 207–212
 - management of, 196–197
 - protected areas, 195–196
 - Okavango Delta (case study), 198–206
- Wilderness Experience Programs (WEP's) *see* vision quests
- Wilderness Transitions, Inc., *see* vision quests
- wildlife,
- in agriculture, 29
 - protection, 29–30
 - sustainability, 26–30
- Wildlife Land Trust, 30
- women, 33–35
- World Bank, xv, 48, 61, 62, 63–67, 69, 113, 254
- Forestry Project, 48
- World Commission on Protected Areas, 3
- World Conservation Bank, x
- World Conservation Monitoring Centre, 3
- World Conservation Union (ICUN), 72–73, 99, 100, 134
- World Resources Institute, 19
- World Wilderness Congress (WWC), ix, 69
- 1st, x
 - 2nd, xiii
 - 3rd, xiii
 - 4th, xv, 72
 - 5th, x, xv, 74
 - 6th, vii–viii, xv
 - resolutions (6th WWC), 295–311

Zunino, Franco, 144

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