



Winter 1989

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Recommended Citation

Philip Dearden, *Wilderness and Our Common Future*, 29 NAT. RES. J. 205 (1989).
Available at: <https://digitalrepository.unm.edu/nrj/vol29/iss1/14>

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Wilderness and Our Common Future

ABSTRACT

This paper discusses the future of wilderness on a global scale. Until now, wilderness has existed generally as a remnant after industrial activities have taken the more productive and accessible lands. This must change if wilderness is to exist into the future. It is suggested that for this to happen the biocentric values of wilderness as a core part of sustainable development must be emphasized at the expense of the anthropocentric values such as recreation traditionally given greater attention in North America. Wilderness definitions will have to be more flexible, especially regarding the role of aboriginal peoples, if wilderness in concept and reality is to play a major role in underdeveloped countries. Although preliminary indications are that about one-third of the globe remains in a wilderness condition, it is argued that this is too optimistic and rigorous efforts need to be made now to protect areas in biomes where competition for resources is great. This will require a change in societal values, and commitments by wealthier nations to assist others in the protection of wilderness resources of global concern. Already some non-government organizations [NGOs] are making significant contributions in this area. Wilderness management issues will also change considerably in the future from the traditional concern of recreation management within the area to broader approaches involving integration of land uses with activities and influences outside the area. The Biosphere Reserve Program is an international program that is seen to have considerable potential to help promote wilderness as part of a sustainable development strategy in developing countries. Increased attention will also have to be devoted to the marine environment. Wilderness is a finite, non-renewable, non-substitutable, irreversible, common resource and, as such, presents a very challenging resource management problem that will require pro-active rather than reactive management if it is to survive into the future.

“Man always kills the thing he loves, and so we the pioneers have killed our wilderness. Some say we had to. Be that as it may, I am glad I shall never be young without wild country to be young in.”

Aldo Leopold *A Sand County Almanac*

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INTRODUCTION

One hundred years from now, when historians look back on this period of history, what will they think of the wilderness debate? Will it be irrelevant to them or will it represent a vital component of a societal watershed of thought that changed the way in which society viewed itself and its relationship to Planet Earth? Will there still be "wild country to be young in?" If there is, it will represent a dramatic change in man's *modus operandi*. Up to the late twentieth century, wilderness has been, by and large, a bi-product. It is what has been left after the "good" land has been taken for agriculture, forestry, mining, urbanization, industry and every other conceivable land-use. The wilderness was wasteland, protected by remoteness and unfavorable environmental attributes from the kinds of land-use noted above. Unfortunately such is no longer the case. Rising populations crowd into practically every corner of the globe. Technology can squeeze returns from lands previously considered barren. If wilderness remains on this planet one hundred years from now it will be because, for the first time in the history of man, we have deliberately chosen that it should be so as a positive benefit rather than an industrial remnant. Wilderness will be protected not by the environmental barriers that have sufficed until now but by pro-active legislative barriers endorsed by society. For this to happen we have to have a very clear idea of what values we seek from wilderness and how these may change in the future.

WILDERNESS VALUES AND THE FUTURE

While conforming to the traditional and curious avoidance of defining wilderness at this point in the paper it may still be productive to examine some of the characteristics and values associated with the term. Manning, in this issue,¹ has already discussed the current status of some of the values that society seeks in wilderness. Here it will be sufficient to briefly discuss a couple of these benefits and project them into the future.

In a North American context, the use with which wilderness is most closely associated is recreation. A large literature exists on this topic,² accompanied by equally impressive statistics relating to use,³ although most recent statistics indicate a reduction in recreational use of wilderness areas. Notwithstanding the latter it is pertinent to ask how much of this

1. Manning, *The Nature of America: Visions and Revisions of Wilderness*, 29 NAT. RES. J. (1989) (this issue).

2. For example, see the collection of papers in *Current Research*, in PROCEEDINGS: NATIONAL WILDERNESS, RESEARCH CONFERENCE (R. Lucas ed. 1986) (Intermountain Research Station, USDA Forest Service, Ogden, Utah [hereinafter RESEARCH CONFERENCE]).

3. See Lucas, *A Look at Wilderness Use and Users in Transition*, 29 NAT. RES. J. (1989) (this issue).

use is obligatory as opposed to incidental use of wilderness? In other words, were there no wilderness, what would happen to this use; could it take place elsewhere or would it die out leaving society bereft of the values dependent on this use of wilderness?

This is a difficult question to come to terms with because it requires knowledge of the motivations, satisfactions and substitutability of wilderness recreation. Very little work appears to have been undertaken on the latter⁴ although Driver and his associates⁵ have explored the first two. Motivations commonly associated with wilderness recreation include physical challenge, solitude, closeness to nature, freedom from restrictions, nature education, self reliance and a sense of achievement. Without examining each of these in depth it is possible to suggest that most, if not all, are not necessarily resident solely in wilderness areas. Indeed outdoor recreationists in many countries that have no remaining wilderness in a North American sense (for example, Great Britain, Japan) would probably show the same kinds of motivational factors for their outdoor pursuits, and arguably similar levels of satisfaction gained from those pursuits.

This suggests that in a North American context, wilderness is a convenient biophysical setting in which to experience the motivations discussed above, but that humans do not necessarily have to be in wilderness to gain those satisfactions.⁶ Were wilderness to disappear within the next century from North America, recreational expectations would merely incrementally adjust to those already existing in most parts of the developed world.

This is true, but not necessarily desirable. The Recreation Opportunity Spectrum (ROS) describes a whole spectrum of recreational motivations and settings.⁷ Wilderness forms one end of this spectrum. In the developed world, arguably only North America and Australia really provide extensive opportunities for high quality wilderness recreation. To remove this opportunity within these areas is undoubtedly possible but quality of experience would be the casualty. That wilderness recreationists could gain similar satisfactions elsewhere says nothing about the intensity of

4. See, e.g., H. Tinsley & T. Johnson, *A Preliminary Taxonomy of Leisure Activities*, 16 J. LEISURE RES. 234 (1984).

5. Driver, Nash & Haas, *Wilderness Benefits: A State of Knowledge Review* in RESEARCH CONFERENCE, *supra* note 2, at 294.

6. But see the arguments raised by Henberg, *Wilderness as Playground*, ENVTL. ETHICS 251 (1984).

7. R. CLARK & G. STANKEY, *THE OPPORTUNITY SPECTRUM: A FRAMEWORK FOR PLANNING, MANAGEMENT AND RESEARCH* (USDA Forest Service Research Paper PNN-98, 1979); Brown, Driver & McConnell, *The Opportunity Spectrum Concept in Outdoor Recreation Supply Inventories: Background and Application*, in PROCEEDINGS OF THE INTEGRATED RENEWABLE RESOURCE INVENTORIES WORKSHOP 73 (USDA Forest Service General Technical Report Rm-55, 1978).

those satisfactions. North Americans can gain satisfaction from our own rather meager built heritage, but this is not a rationale for destroying the infinitely richer buildings of Europe. Conversely, that Europeans, Japanese and others can gain wilderness-type experiences from their own anthropocentric landscapes is not a rationale to argue that North American standards of wilderness are unnecessary. Such extremes define the potential of man and Planet Earth.

Besides recreation there are many other anthropocentric or use-related values derived from wilderness. These fall into categories such as cultural, therapeutic, spiritual and aesthetic. By and large the argument made above for recreational use holds true for these uses. They are important values derived from wilderness but wilderness is not the total, or even the main source of such values on a global scale. Were there to be no wilderness at the end of the next century, society would not collapse through failure to obtain such values from wilderness. They would simply be obtained elsewhere, as is now the case in many parts of the globe.

This line of argument is exploring the widely accepted distinction between psychological and biophysical qualities of wilderness.⁸ Those discussed above are largely psychological in nature and, given man's adaptability, may not be purely wilderness-dependent. They do, however, represent some of the strongest historical arguments for wilderness designation. Many wilderness areas in the U.S. were set aside for these very reasons.⁹ Despite the fact that the value of wilderness as a source of these psychological benefits will undoubtedly rise in the future as wilderness-type areas become increasingly scarce, these are not the main arguments with which to launch wilderness into the next century on a global scale. They are too culture-specific and not restricted to wilderness.

Wilderness will survive, if at all, one hundred years from now, resting on biophysical rather than psychological arguments. It will survive as an integral part of a world conservation strategy that has recognized the necessity to preserve some small fragments of natural areas on this planet for their ecological, scientific and educational benefits. This is clearly recognized in works such as the World Conservation Strategy published by the International Union for Conservation of Nature [IUCN]¹⁰ and more recently in the report of The World Commission on Environment and Development, *Our Common Future*.¹¹ The Commission was established by the United Nations to identify long term environmental strategies for achieving sustainable development by the year 2000 and beyond. Chaired

8. R. NASH, *WILDERNESS AND THE AMERICAN MIND* (3d ed. 1982).

9. *Id.*

10. See R. PRESCOTT-ALLEN, *HOW TO SAVE THE WORLD* (1980).

11. WORLD COMM'N ON ENV'T AND DEV., *OUR COMMON FUTURE* (1987).

by Gro Harlem Brundtland, the 23 member commission, representing a global cross-section of nations both geographically and economically, and soliciting input from thousands more citizens, reached solemn conclusions:

When the century began, neither human numbers nor technology had the power to radically alter planetary systems. As the century closes, not only do vastly increased human numbers and their activities have that power, but major, unintended changes are occurring in the atmosphere, in soils, in waters, among plants and animals, and in the relationships among all of these. The rate of change is outstripping the ability of scientific disciplines and our current capabilities to assess and advice. It is frustrating the attempts of political and economic institutions, which evolved in a different, more fragmented world, to adapt and cope.¹²

Change, they suggest, is imperative within the next decade because, “. . . attempts to maintain social and ecological stability through old approaches to development and environmental protection will increase instability.”¹³ This new approach must include protection of species and ecosystems as “an indispensable prerequisite for sustainable development.”¹⁴ Expert opinion¹⁵ suggests that this will entail at least a tripling of the current protected area network in the world to adequately represent a sample of Earth's ecosystems.¹⁶

Thus, notwithstanding the power of the recreational and transcendental arguments that have worked in North America and elsewhere to establish wilderness systems, in the future the appeal will lie in a much broader approach focused upon sustainable development and the role that natural areas play in regulating essential life-processes, wildlife pools, genetic reservoirs, scientific inquiry and education. These concerns are neither as culture-based as the psychological *raison d'être*, nor as geographically limited. They represent an evolution of philosophy of protected areas from monumentalism through protectionism to isolationism and eventually integration.¹⁷ The latter need not, and should not, imply a weakening of the purity of such areas but rather a more sensitive and flexible approach

12. *Id.* at 22.

13. *Id.*

14. *Id.* at 166.

15. See NATIONAL PARKS, CONSERVATION AND DEVELOPMENT: THE ROLE OF PROTECTED AREAS IN SUSTAINING SOCIETY (J. McNeely & K. Miller eds. 1984) [hereinafter NATIONAL PARKS].

16. As distinguished using the system suggested by M. UDVARDY, A CLASSIFICATION OF THE BIOGEOGRAPHICAL PROVINCES OF THE WORLD (IUCN Occasional Paper No. 18).

17. See Eidsvik, *Biosphere Reserves in Concept and in Practice*, in PROCEEDINGS: CONFERENCE ON THE MANAGEMENT OF BIOSPHERE RESERVES 8 (J. Peine ed. 1985) (National Parks Service, Uplands Field Research Lab., Great Smoky Mountains National Park, Gatlinburg, Tenn.).

to the future designation and management of wilderness areas. Some of these problem will be examined in the next section.

WILDERNESS DESIGNATION IN THE FUTURE

Before proceeding any further with this discussion of wilderness it is necessary to clarify the definition of the term as used here. Eidsvik, in an earlier paper in this volume,¹⁸ has argued that the definition of wilderness used as the touchstone in the largest designated wilderness system, that in the United States, is not appropriate for most of the rest of the world. In particular the idea that a wilderness must be totally uninhabited, while perhaps a necessary condition in developed societies where habitation often entails pronounced changes on biophysical systems, is not acceptable in many parts of the world, where aboriginal people may live a relatively harmonious existence with the natural world. Eidsvik proposes the following:

Wilderness is an area where natural processes dominate and people may co-exist as long as their technology and their impacts do not endure.¹⁹

This is the definition adopted here.

At the moment only five countries have legislated wilderness lands *per se*, the United States, Australia, Canada, South Africa and New Zealand, although some 125 countries have some form of protected area system that may include wilderness areas.²⁰ Having established in the previous section some of the enduring and necessary benefits of wilderness to society, particularly those related to biophysical process and resource pool maintenance, it is necessary to ask how much wilderness do we have left and where is it?

Surprisingly little work has been undertaken on a global scale. IUCN maintains an inventory of protected areas in the world,²¹ but, of course, not all protected areas are wilderness, nor is all wilderness in protected areas. McCloskey and Spalding²² have undertaken a reconnaissance level inventory looking for "empty quarters" on the Jet Navigation and Operational Navigation Charts (1:2,000,000 and 1:1,000,000 respectively) of the U.S. Defense Mapping Agency. They looked for blocks of a minimum size of 400,000 hectares with no "roads, settlements, buildings, airports, railroads, pipelines, powerlines, canals, causeways, aqueducts,

18. Eidsvik, *The Status of Wilderness: An International Overview*, 29 NAT. RES. J. (1989) (this issue).

19. *Id.*

20. *Id.*

21. IUCN, UNITED NATIONS LIST OF NATIONAL PARKS AND PROTECTED AREAS (1985).

22. J. McCloskey & H. Spalding, A Reconnaissance-Level Inventory of the Wilderness Remaining in the World (1987) (paper presented at the Fourth World Wilderness Conference, Denver, Colo.).

major mines, dams and reservoirs, and oil wells."²³ They estimate that about one-third of the globe remains in a wilderness condition, distributed by continent as shown in Table 1.

These figures should not give rise to undue optimism for several reasons. First, as the authors point out, the quality of data was not always good, and in some cases very poor. Not only is it dated (the most recent is early 1980s, with some well back into the 1970s), but also it does not show agricultural and forestry activities, two of the main forces destroying wilderness on a global scale. A cursory inspection of the map produced shows several large areas of "wilderness" in Canada that personal field experience indicates have been subject to logging activities. A similar problem for lesser-developed tropical countries is pointed out by the authors. Here settlements, developments and agricultural and forestry activities may take place with rivers, rather than roads, being the main access. As roads are a major feature of the charts and a main disqualifier for wilderness, this may also lead to an over-estimation of the amount of wilderness in such environments. Obviously a fair amount of ground truthing on a more detailed basis is now required.

A further problem relates to the definition and distribution of the wilderness. The authors confine themselves to an anthropocentric approach, quite justifiably given their goal, and seek remoteness and primitiveness *per se*.²⁴ However, reference to Table 2 shows that 60 percent of this wilderness occupies environments of little biological productivity such as tundra and warm deserts. The figure rises to 80 percent if temperate needleleaf forests are included. Such areas may well fulfill the definition of wilderness presented but may be totally inadequate for fulfilling some of the biocentric benefits society expects from wilderness.

This is a critical point. All wilderness areas are not equal in their abilities to provide benefits. Traditionally wilderness areas have been "wastelands," unwanted by industrial/agricultural man. It would be possible to protect 60 percent of the remaining wilderness of this planet (the tundra and warm deserts), some 31 million square kilometers of land, with some, but not major, conflict with industrial man. These lands have, relatively speaking, little to offer industrial man. They are still "wastelands." But would such a move satisfy the need for wilderness preservation? Of course not.

Substantial wilderness areas are required in all biomes if they are to fulfill the biocentric roles outlined earlier. This will require protection of lands other than industrial remnants, lands where society must be willing to forgo immediate and industrial returns for more long-term and eco-

23. *Id.*

24. See Lesslie & Taylor, *The Wilderness Continuum Concept and Its Implications for Australian Wilderness Preservation Policy*, 32 BIOLOGICAL CONSERVATION 309 (1985), for a similar approach.

	<i>Wilderness Sq. Km.</i>	<i>Percent Wild</i>	<i>No. of Areas</i>
Antarctic	13,209,000	100%	2
Asia	11,864,000	27%	306
Africa	9,177,700	30%	437
North America	9,006,700	36%	89
South America	4,222,700	24%	91
Oceania and Australia	2,666,300	30%	94
Europe	741,000	7%	31
	50,887,400	34%*	1,050

FIGURE 1. Remaining Wilderness by Continent

*Derived by dividing the total wilderness for the world of 50,887,400 sq. km. by the total size of the world's land mass of 149,664,000 sq. km. (After McCloskey and Spalding)

	<i>Wilderness Sq. Km.</i>	<i>No. of Areas</i>	<i>% of Total Wilderness</i>
(1) Tundra Communities	21,321,600	104	41.9%
(2) Warm Deserts	10,158,600	391	20.0%
(3) Temperate Needleleaf Forests	8,893,400	126	17.5%
(4) Tropical Humid Forests	3,532,300	78	6.9%
(5) Tropical Dry Forests	1,723,800	120	3.4%
(6) Cold Winter Deserts	1,630,300	51	3.2%
(7) Mixed Mountain Systems	1,463,900	75	2.9%
(8) Tropical Grasslands	768,000	33	1.5%
(9) Temperate Rainforests	457,700	15	0.9%
(10) Temperate Broadleaf Forests	332,000	20	0.7%
(11) Temperate Grasslands	310,000	23	0.6%
(12) Evergreen Sclerophyllus Forests	186,200	7	0.4%
(13) Mixed Island Systems	109,500	7	0.2%
TOTAL	50,887,300	1,050	100.0%

**FIGURE 2. Remaining Wilderness by Realm and Biome
(After McCloskey and Spalding)**

logical returns.

This transition is a very difficult one. Despite the fact that British Columbia, for example, has 5.8 percent of its total area in park land,²⁵ the majority of this area is in mountains and icefields. The highly publicized and bitter confrontations over the temperate rain forests of Meares Island off the coast of Vancouver Island²⁶ and Moresby Island in the

25. B.C. WILDERNESS ADVISORY COMM., *THE WILDERNESS MOSAIC* (1986).

26. See Dearden, *Landscape Aesthetics, Tourism and Landscape Management in British Columbia*, in *LANDSCAPE ECOLOGY IN CANADA* 183 (M. Moss ed. 1988).

Queen Charlottes,²⁷ represent efforts to try to preserve lands that are valuable both for forestry and wilderness. Kellow, in this volume,²⁸ describes a very similar case involving temperate rain forests in Tasmania. Table 2 indicates that only 0.9 percent of the total wilderness remaining is in temperate rainforest. It is such areas where obviously greater efforts need to be made if wilderness is to be able to deliver some of the anticipated benefits. This is why the so-called wilderness victories in Canada over Moresby and in Australia over the Franklin are highly significant developments within those countries. They indicate that these respective societies have evaluated the relative merits of industrial development or wilderness protection for the very valuable disputed lands and chosen to recognize the latter as being of primary importance.

Such a watershed of changes in societal values, indicated by these decisions, should not be seen as a steep watershed whereby all decisions will now fall on the wilderness side of the catchment area.²⁹ This will not happen. Decisions will continue to fall on either side, but at least that is some advance from the almost exclusively pro-industrial development bias heavily entrenched within the bureaucratic and political realms.³⁰

This change in values has been characterized by authors such as Dunlap and Van Liere³¹ as a paradigm shift from the Dominant Social Paradigm (DSP) to a New Environmental Paradigm (NEP). These paradigms represent constellations of beliefs and values that constitute particular "world views." The DSP is, as the name implies, the dominant constellation, molded and handed down from generation to generation. Several authors³² have suggested that many of the environmental problems now existing in society are a result of this DSP. The DSP can be characterized as an anthropocentric world view believing most strongly in man, science and

27. See Nelson, *Wilderness in Canada: Past, Present, Future*, 29 NAT. RES. J. (1989) (this issue); Sewell, Dearden & Dumbrell, *Wilderness Decisionmaking and the Role of Environmental Interest Groups: A Comparison of the Frankling Dam, Tasmania and South Moresby, British Columbia Cases*, 29 NAT. RES. J. (1989) (this issue); Dearden, *Mobilizing Public Support for Environment: The Case of South Moresby Island, British Columbia*, in PROCEEDINGS: 17TH ANNUAL JOINT MEETING OF THE ENVIRONMENT COUNCIL OF ALBERTA 62 (1987).

28. Kellow, *The Dispute Over the Franklin River and South West Wilderness Area in Tasmania, Australia*, 29 NAT. RES. J. (1989) (this issue).

29. Davis, *Wilderness Conservation in Australia: Eight Governments in Search of a Policy*, 29 NAT. RES. J. (1989) (this issue); see Nelson, *supra* note 27.

30. Kellow, *supra* note 28; B.C. WILDERNESS ADVISORY COMM., *supra* note 25.

31. Dunlap & Van Liere, *Commitment to the Dominant Social Paradigm and Concern for Environmental Quality*, 65 SOC. SCI. Q. 1013 (1984); Van Liere & Dunlap, *The Social Bases of Environmental Concern: A Review of Hypotheses, Explanations, and Empirical Evidence*, 44 PUB. OPINION Q. 181 (1980); Dunlap & Van Liere, *The New Environmental Paradigm: A Proposed Measuring Instrument and Preliminary Results*, 9 J. ENVTL. EDUC. 10 (1978).

32. W. TUCKER, *PROGRESS AND PRIVILEGE: AMERICA IN THE AGE OF ENVIRONMENTALISM* (1982); D. WHISENHUNT, *THE ENVIRONMENT AND THE AMERICAN EXPERIENCE* (1974); Christensen & Norgard, *Social Values and Time Limits to Growth*, 9 TECHNOLOGICAL FORECASTING AND SOC. CHANGE 411 (1976); e.g., Swan, *Environmental Education: One Approach to Resolving the Environmental Crisis*, 3 ENV'T & BEHAV. 223 (1971).

technology to solve problems, and an abundance of natural resources. The NEP, by way of contrast, represents a more biocentric view, with man being part of and bounded by, nature, and therefore accepting limits to growth and the need to protect the integrity of ecosystems.

Several authors have used these concepts to examine environmental conflicts and preferences.³³ Although the newness of the measuring scale precludes any extensive longitudinal testing, studies that have attempted to document the growth of the NEP are encouraging. Dunlap and Van Liere conclude:

When we consider that just a few short years ago concepts such as "limits to growth" and "spaceship earth" were virtually unheard of, the degree to which they have gained acceptance among the public is extremely surprising. This acceptance is all the more surprising when one realizes how dramatically the NEP departs from our society's traditional world view or dominant social paradigm. Indeed, in a society which has always taken abundance growth, progress etc. for granted, the size of the NEP represents a revolutionary occurrence.³⁴

It is this revolution of societal values that is required to help establish and protect wilderness in the future in areas that require the foregoing of industrial and agricultural returns. The World Commission on Environment and Development in their public hearings, "found everywhere deep public concern for the environment, concern that has led not just to protests but often to changed behavior."³⁵ But, they continue, "the challenge is to ensure that these new values are more adequately reflected in the principles and operations of political and economic structures."³⁶

One major problem in this regard is the common property resource nature of wilderness. Garret Hardin has outlined the nature of the tragedy of the commons in his famous essay of the same name.³⁷ The problem with common property resources is that it is of societal benefit that they be maintained, but yet to individual benefit that they be exploited to the full. Thus the biocentric rationale for wilderness is a global concern; the maintenance of wilderness areas benefits all mankind through mainte-

33. Geller & Lasley, *The New Environmental Paradigm Scale: A Re-examination*, 17 J. ENVTL. EDUC. 9 (1986); Arcury, Johnson, and Scalloy, *Ecological Worldview and Environmental Knowledge: The New Environmental Paradigm*, 17 J. ENVTL. EDUC. 35 (1986); Jackson, *Environmental Attitudes and Preferences for Energy Resource Options*, 17 J. ENVTL. EDUC. 23 (1985); Albrecht, Buttana, Holberg & Nowak, *The New Environmental Paradigm Scale* 13 J. ENVTL. EDUC. 39 (1982); see sources cited *supra* note 31.

34. Dunlap & Van Liere (1978), *supra* note 31.

35. WORLD COMM'N ON ENV'T AND DEV., *supra* note 11, at 28.

36. *Id.*

37. Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243 (1968).

nance of essential biophysical processes and protection of genetic diversity. However, to realize the benefits requires particular areas in particular countries not be exploited by their inhabitants. Individual gain must be sacrificed for communal good. Unfortunately some of these areas are amongst those least able to forego such immediate and personal benefits for the good of society. Again the World Commission on Environment and Economic Development states:

Those who are poor and hungry will often destroy their immediate environment in order to survive: They will cut down forests; their livestock will overgraze grasslands; they will overuse marginal land; and in growing numbers they will crowd into congested cities. The cumulative effect of these changes is so far reaching as to make poverty itself a major global scourge.³⁸

This is exactly the point with wilderness preservation. It is a global concern and a global responsibility. If the Amazonian rain forests are to be left intact for the benefit of all mankind then all mankind should bear the costs of that decision.

Fortunately, there are some signs that this is happening and that the more affluent nations and their aid agencies (such as the Canadian International Development Agency [CIDA] and US AID), international organizations (such as the World Bank) and concerned citizens (especially as represented by major NGO's) are taking positive actions. One problem is the tremendous overseas debt (estimated to be over \$1 trillion) owed by lesser developed countries. In an effort to maintain interest payments on this debt many such countries are encouraging wholesale exploitation of their natural resources—forests, fisheries and minerals. In what is hoped will be a precedent-setting deal, Bolivia in 1987 announced that 1.5 million hectares of virtually untouched rain forest would be given protected status in return for a financially favorable settlement of a debt. The deal was made possible largely by two U.S. based NGO's, one of whom is now negotiating with other debtors.

Other NGO's such as World Wildlife Fund, have also invested heavily in the protection of areas of tropical rainforest. This organization has committed over \$7 million through its Tropical Habitat program to projects in countries such as Columbia, Costa Rica, Mexico, Belize, Guatemala and China. Jaguar Cars are a main sponsor of the effort in Belize, which involves rainforest protection for jaguar habitat. Earth First recognized a different problem: that of the destruction of tropical wilderness for the tastes of developed countries. In May 1987, they organized "Whopper Stopper Month" to announce their boycott of Burger King throughout

38. WORLD COMM'N ON ENV'T AND DEV., *supra* note 11, at 28.

the United States for that company's contribution to depleting tropical rainforests in order to grow more beef for the U.S. hamburger market. In a similar mode Coca Cola, owners of 81,000 hectares of tropical forest in Belize, have been persuaded to abandon their plans to grow oranges there following an education campaign launched by the Rainforest Action Network and Friends of the Earth, U.K.

WILDERNESS MANAGEMENT IN THE FUTURE

To some, management of wilderness is a contradiction in terms.³⁹ Wilderness is a place for elemental freedoms, no management, no interference. Unfortunately, however much one might agree philosophically with such a view, experience indicates that this is no longer a feasible course of action (or non-action). Left to themselves wilderness areas may cease to produce the expected benefits both psychologically, in terms of recreation experiences, and also biophysically. With regard to the latter it is only recently for example, that managers have become cognizant of the need to actually set, as opposed to extinguish, fires in certain ecosystems to retain their integrity.⁴⁰

Most of our knowledge of management of wilderness areas has developed in a North American situation.⁴¹ Substantial literature exists on use and users, as summarized by Lucas earlier in this issue.⁴² This will remain germane in a North American context but will have reduced applicability elsewhere. Management problems will be of a scale and nature very different to those where effort has traditionally been concentrated.

The report of the World Commission on Environment and Development⁴³ is quite conclusive about the changes taking place to biophysical systems on a global scale. Scarcely a day goes by without the popular press carrying stories about acid rain, ozone depletion and the "greenhouse" effect. The extent of these problems and the interconnectedness of all biophysical systems means that wilderness management in the future has to adopt a far broader perspective. Small pristine islands of wilderness will not survive in a rapidly changing world, no matter how good the management within those areas. The first requirement then is to realize that problems such as climatic change, water pollution and urbanization are, to varying degrees of extent, wilderness problems too. This has been

39. R. NASH, *supra* note 8.

40. For example, see the collection of papers in section I of *Wilderness Fire Research*, in RESEARCH CONFERENCE, *supra* note 2.

41. J. HENDEE, G. STANKEY & R. LUCAS, WILDERNESS MANAGEMENT (USDA Forest Service Publication 1365, 1978).

42. Lucas, *supra* note 3.

43. WORLD COMM'N ON ENV'T AND DEV., *supra* note 11.

realized by major NGO's such as the National Parks and Conservation Association in the United States who have made acid rain one of their top priorities.

To these kinds of problems, particularly relating to changes in hydrospheric and atmospheric systems, protected areas present a totally permeable barrier. To other external influences, forestry for example, protected areas can present a seemingly impermeable barrier.

However, it is being increasingly recognized that even such impermeable barriers are not adequate to give full protection to the wilderness values inside the protected area.⁴⁴ Although forestry practices, for example, may stop at the boundary their influence in terms of hydrology, aesthetics and wildlife do not. In the future, wilderness management is going to have to pay closer attention to adjacent land uses in order to maintain the benefits derived from the wilderness.

One international program that has a lot of potential in this regard is the Biosphere Reserve Program. Biosphere Reserves usually consist of a relatively pristine "core" area surrounded by a multiple use buffer zone where the emphasis is upon sustained use, demonstration projects and rehabilitation. The two zones are complementary—an unmodified natural ecosystem adjacent to a modified one, but modified in an ecologically sensitive and sustainable manner and one that does not interfere with the core processes. Such reserves exist in 85 of the world's biogeographic provinces in 70 countries, totalling 261 areas.⁴⁵ International perspectives on these reserves have been provided by authors such as Linquist, Sumardja and Engel.⁴⁶

As the idea of formal protection of wilderness areas expands from its North American heartland to other places and cultures, another management problem that is going to be of increasing significance relates to the role of indigenous cultures. Several authors have indicated that, at least on the surface, the goals of conservationists and indigenous peoples are not that different.⁴⁷ Both seek to preserve natural ecosystems from industrial extractive development. A good example of this symbiotic relationship is provided by the strong alliance formed by concerned

44. See Schonewald-Cox & Bayless, *The Boundary Model: A Geographical Analysis of Design and Conservation of Nature Reserves*, 38 *BIOLOGICAL CONSERVATION* 305 (1986); Garratt, *The Relationship Between Adjacent Lands and Protected Areas: Issues of Concern for the Protected Area Manager*, in *NATIONAL PARKS*, *supra* note 15, at 65.

45. Gregg & McGean, *Biosphere Reserves: Their History and Their Promise*, 4 *ORION* 40 (1985).

46. Engle, *Biosphere Reserves as Sacred Space: Renewing the Bond of Mankind and Nature*, 4 *ORION* 52 (1985); Lindquist, *Biosphere Reserves from the European Perspective*, in *TOWARDS THE BIOSPHERE RESERVE: EXPLORING RELATIONSHIP BETWEEN PARKS AND ADJACENT LANDS* 192 (R. Scace & C. Martinka eds. 1983) [hereinafter *TOWARDS THE BIOSPHERE RESERVE*]; Sumardja, *Biosphere Reserves from the Southeast Asian Perspective*, in *TOWARDS THE BIOSPHERE RESERVE*, *supra*, at 201.

47. For example, see the collection of papers in *CULTURE AND CONSERVATION: THE HUMAN DIMENSIONS IN ENVIRONMENTAL PLANNING* (J. McNeely & D. Pitt eds. 1985).

environmentalists and the Haida people to protect the forests of South Moresby Island, off the coast of British Columbia, from logging activities. South Moresby, comprised in fact of an archipelago of some 138 islands, constitutes part of the ancient homeland of the Haida. It is an environment of exceptional biological productivity in which the Haida flourished for centuries before withdrawing in the late nineteenth century due to decimation from introduced diseases. Their abandoned villages and totem poles remain as mute testimony to this occupation.

In 1974, a significant portion of the area was proposed for forest harvesting activity which precipitated an alliance of non-native and native interests to prevent the logging. The issue came to a head in 1985 when the Haida people physically blocked legally sanctioned logging activities and were arrested. In 1987 a Memorandum of Understanding was signed between the province of British Columbia and the government of Canada to negotiate towards a national park reserve. The latter differs from a national park in that it does not prejudice current or future native land claims on the area. It is the designation that is used wherever there are native concerns regarding land title and national parks in Canada. Without this designation native land claims could effectively block the creation of many parks in the country. It is a tacit acceptance by the native peoples of a commonality of interest.

Such symbiosis is not always the case, however, and even where it is, management details often cause friction. In Canada, for example, although the rights to traditional hunting activities for native people have been acknowledged in protected areas, conflicts arise over details such as seasonal restrictions and modes of pursuit. It is one thing to allow traditional hunting of caribou and whales by the Inuit as their forefathers have done for thousands of years before them, but does this endorse the use of high-powered rifles, spotting planes, snow-mobiles and power-boats? Although many authors agree on the desirability of allowing native subsistence use in protected areas, increasingly questions such as the foregoing are going to be of concern.

In other cases, the activities of indigenous peoples, even in a subsistence mode, are in conflict with basic conservation principles and wilderness goals. Andriamampianina,⁴⁸ for example, describes the destructive role native peoples play in Madagascar through their slash and burn agricultural activities. Slash and burn is probably amongst the oldest forms of agriculture and at a certain scale and intensity could be considered as not too destructive. Unfortunately rising populations amongst many indigenous peoples coupled with a shrinking land base as industrial forestry

48. Andriamampianina, *Traditional Land-Use and Nature Conservation in Madagascar*, in *id.* at 81.

activities increase, means that more and more people are trying to exist on less and less land. The forests do not have adequate time to regenerate themselves between clearings and the entire area becomes cut-over in the search for new lands.

This has happened in the Highlands of northern Thailand. Six main hilltribes live in the area, most of them originating in south and southwest China and being fairly recent arrivals. All are basically swidden agriculturalists growing upland rice, maize and opium. Villages move to make new swiddens on average every 18 years.⁴⁹ The hilltribes are also experiencing very rapid population growth of some 4 percent per annum.⁵⁰ At the same time the Highlands, traditionally protected by their remoteness and rugged terrain, are being increasingly opened up for their timber resources and the expansion of lowland agriculture up into the Highland valleys. The resultant squeeze on the land resources makes it very difficult for the Royal Thai Government to establish and maintain any protected areas in the region. Although several have been designated (e.g. Doi Inthanon, Doi Khuntan, Doi-Suthep-Pui, Lansang) protecting their resources from the hilltribes is a major management problem.

One development that may have some benefits to both the hilltribes and the establishment and management of protected areas is the growth of adventure tourism, in the form of trekking, in the region. Dearden⁵¹ has described the spectacular growth rates of the activity and some of the impacts on the hilltribes. One such impact is income augmentation, largely through accommodation of trekkers in hilltribe villages. Given that such monies can be a significant proportion of village income in some situations, it is unlikely that the village would move to a new location to seek new swiddens and risk the loss of that income. It is possible therefore, that the growth in trekking could have a positive benefit for protected areas in helping to re-inforce the sedentarisation programs for the hilltribes initiated by the Royal Thai Government.

So far, this discussion has confined itself to questions of designation and management of terrestrial wilderness areas. There is, however, a growing recognition of the need for establishing wilderness type principles for at least some of the 70 percent of the planet that is the ocean. The Fourth World Wilderness Congress held in 1987 in Denver, Colorado, recognized this need for such an initiative and organized the first Ocean

49. See the papers in *FARMERS OF THE HILLS: UPLAND PEOPLES OF NORTH THAILAND* (A. Walker ed. 1975) for more details on these tribes.

50. Kundstadter, *Highland Populations in Northern Thailand*, in *HIGHLANDERS OF THAILAND 15* (J. McKinnon & W. Bhruksasri eds. 1983).

51. Dearden, *Tourism in Developing Societies: Some Observations on Trekking in the Highlands of North Thailand*, in *FIRST GLOBAL CONFERENCE: TOURISM: A VITAL FORCE FOR PEACE* (1988) (Pre-Congress publication, Vancouver, Can.) (in press).

Wilderness Seminar with the following objectives:

Encourage the exchange of ideas and perspectives on ocean wilderness and its relationship to the sustainable use of ocean systems;

Inform participants of integrated approaches for managing ocean systems for all uses including wilderness;

Examine and learn from the successes and shortcomings of past attempts at integrated management of ocean systems;

Develop a broad consensus of future directions for integrated management of ocean systems, and

Encourage individuals and organizations to include marine conservation goals in their personal and institutional agendas.⁵²

Notwithstanding such laudable objectives, the seminar never really came to grips with the topic of ocean *wilderness*, as opposed to ocean *conservation*. No principles were enunciated that might characterize ocean wilderness and any applicability of terrestrial wilderness concepts and management to an oceanic wilderness situation was rejected. It is suggested that this view is somewhat myopic and, despite the obvious differences between terrestrial and marine ecosystems, there are points of commonality particularly, for example, in terms of management for recreational uses of oceanic and terrestrial wilderness areas.

CONCLUSIONS

This issue has put together a collection of state-of-the art papers on the topic of wilderness. This final paper has sought to build upon this collection and project into the future. The concept of wilderness is a broad one and with the world experiencing change more rapid than ever before in all realms of life it is difficult to project into the future with any certainty. Nonetheless it seems as though wilderness is emerging as a topic of major global consequence rather than as a recreational fad in certain rich countries. This is by virtue of the recognition of the intrinsic biocentric benefits derived from wilderness and the role they play in developing a sustainable future.

Resources can be classified in many ways reflecting various characteristics. Wilderness has the following kinds of resource characteristics:

- (1) It is a finite resource. Some resources, such as the so-called "flow" resources (e.g. tidal power) can be considered infinite. Wilderness is not infinite, it is a bounded and set entity. Finite

52. Ocean Wilderness Seminar Outline (1987) (presented at Fourth World Wilderness Congress, Denver, Colo.).

- resources, because of their very nature, require more conservative planning approaches than infinite resources;
- (2) It is a non-renewable resource. Generally biological resources (e.g. trees, fish, wildlife) are considered renewable resources. They can be depleted and replaced over time with no loss in value. This is not true for wilderness on any realistic time-scale. Although trees will regrow, the trees that are being harvested in the temperate rain forests, for example, may be over 1,000 years old. To provide similar social and ecological values will require at least that time period, for the resource to be considered renewable. This is not a realistic time-scale.
 - (3) It is a non-substitutable resource. Some resources have substitutes which may provide similar if not identical values to the original resource. Many metals would be of this nature. In this paper I have argued that although wilderness is arguably a substitutable resource in a psychological sense, it is a non-substitutable resource in a biophysical sense. Areas where natural ecosystems remain intact are necessary to continue essential life support processes and provide living resource pools.
 - (4) It is an irreversible resource. Some resources can be processed and returned to their original state. Wilderness is not such a resource given the time restrictions outlined above.
 - (5) It is a common resource. Wilderness has many of the characteristics and problems of common property resources as discussed earlier in the paper.

Each of the five characteristics outlined above represent arguments as to why wilderness has, as a resource, to be managed in such a careful manner. A finite, non-renewable, non-substitutable, irreversible, commons resource is a far more fragile and challenging management situation than an infinite, renewable, substitutable, reversible, private resource. This demands that management be pro-active rather than reactive, and that wilderness values be reflected in our bureaucratic processes, institutions and political decisionmaking. This is the challenge to ensure that society can still derive the same values from wilderness in one hundred years as it does today.