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Front cover photo of Antarctica, the world's largest wilderness by Roland Kreher. Inset photo of emperor penguin.

Special thanks to guest editors for this issue, Paul R. Dingwall and Gordon Cessford, Department of Nature Conservation, New Zealand.

International Journal of Wilderness

The *International Journal of Wilderness* links wilderness professionals, scientists, educators, environmentalists, and interested citizens worldwide with a forum for reporting and discussing wilderness ideas and events; inspirational ideas; planning, management, and allocation strategies; education; and research and policy aspects of wilderness stewardship.

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RENEWING THE WILDERNESS CHALLENGE

BY ALAN EWERT, ACTING MANAGING EDITOR

WITH JOHN HENDEE ON SABBATICAL, it is with great pleasure that I assume the responsibilities of acting managing editor for the *International Journal of Wilderness*. Let me also welcome Woody Hesselbarth and say good-bye to Dr. Jim Fazio. Woody comes to us from the U.S. Forest Service (USFS) and will be assuming responsibility for the Wilderness Digest section of the *IJW*. We welcome Woody and look forward to the information he provides. Jim Fazio has very capably managed the *IJW*'s Book Review section, and we are indeed grateful for his time and expertise in putting that effort into operation. Jim will be stepping down from that position to assume other responsibilities, and *IJW* will be seeking to fill in behind him. I would also like to extend an enthusiastic welcome to our new executive editor for our Stewardship section, Margaret Petersen. Margaret is a senior executive with a strong wilderness background, coming to us from the USFS in Portland, Oregon. We look forward to utilizing Margaret's many talents to complement the *IJW*.

Last spring I had the opportunity to attend the 3rd International Conference of Science and the Management of Protected Areas. During that conference it became crystal clear to me that the threats to wilderness and other protected lands are not diminishing, but rather are growing more prominent. While it is true that society has now begun to recognize the value of wilderness in all its many forms and varieties, the new and emerging threats facing our protected lands tend to be more diffuse and insidious. Many would agree with providing more housing and amenities for our various societies. Our colleagues in the extraction industries have become more adept at promoting development under the flag of minimum disturbance and impact.

The wilderness movement across the globe has made tremendous progress by instilling in our citizenry a sense of awe and respect for wildlands and undeveloped areas. Read about wilderness in the coldest, iciest, windiest, highest, and remotest of the world's continents, Antarctica, our feature country for this issue. Five authors have provided their unique perspectives on this great place.



IJW acting managing editor Alan Ewert.

Let us not lose sight of the values wilderness and other protected lands bestow on our society. Part of these values have now been quantified by Robert Costanza, et al., in the May 15 issue of *Nature*. Costanza and his colleagues suggest that globally, nature provides services to humankind worth approximately 33 trillion dollars (U.S.) per year. Whatever the economic value, we know that wilderness provides all of us with much beyond dollars and cents. Our challenge will be not to lose sight of that fact and to continue to strive to protect our wilderness resources. While cherishing our past, our gaze needs to be focused on our desired future.

As Aldo Leopold once said, "The richest values of wilderness lie not in the days of Daniel Boone, nor even in the present, but rather in the future." **IJW**

6TH WORLD WILDERNESS CONGRESS POSTPONED

The chairman of the 6th World Wilderness Congress (Mr. M. A. Partha Sarathy) has announced through the WILD Foundation that the 6th WWC will be postponed for 12 months. This unanticipated decision is the result of recent political and economic changes within India. An unexpected vote of no confidence in the government of Prime Minister Gowda has resulted in political and economic uncertainty that will likely last until the next general election. A new government has been formed under Prime Minister Gujral, and the dates for national and state elections are being determined.

The 6th WWC Planning Committee in India was reluctant to make this decision, but acted in the best interests of WWC sponsors, speakers, and delegates. According to Vance Martin, president of the WILD Foundation at the International Center for Earth Concerns, "Our most important goal is that the wilderness and wildland objectives of the WWC have maximum impact and effectiveness. This change supported that goal."

The new date for the 6th WWC is the end of October 1998. New brochures will be issued in due course. In its announcement, the WILD Foundation also emphasized that increasing interest by media outlets in the work and objectives of the WWC will be a new and important expansion of the 6th WWC when it meets next year. For a full copy of the announcement and updated 6th WWC information, contact Vance Martin on e-mail, wild@fishnet.net, or Partha Sarathy in India, partha@giasbg01.vsnl.net.in.

SOUL OF THE WILDERNESS

“With Only the Howl of a Timber Wolf...”

BY DANIEL L. DUSTIN

*Were you ever out in the Great Alone, when the moon was awful clear,
And the icy mountains hemmed you in with a silence you most could hear;
With only the howl of a timber wolf, and you camped there in the cold,
A half-dead thing in a stark, dead world, clean mad for the muck called gold;
While high overhead, green, yellow and red, the North Lights swept in bars?—
Then you’ve a hunch what the music meant ... hunger and night and stars.*

—From Robert Service’s “The Shooting of Dan McGrew”

“WITH ONLY THE HOWL OF A TIMBER WOLF ...” What is the meaning of this line? What does the howl of a timber wolf tell us about nature, about ourselves, about the condition of the world? In *A Sand Country Almanac*, Aldo Leopold writes:

A deep chesty bawl echoes from rimrock to rimrock, rolls down the mountain, and fades into the far blackness of the night. It is an outburst of wild, defiant sorrow and of contempt for all the adversities of the world.

Every living thing (and perhaps many a dead one as well) pays heed to that call. To the deer it is a reminder of the way of all flesh, to the pine a forecast of midnight scuffles and of blood upon the snow, to the coyote a promise of gleanings to come, to the cowman a threat of red ink at the bank, to the hunter a challenge of fang against bullet. Yet behind these obvious and immediate hopes and fears there lies a deeper meaning, known only to the mountain itself. Only the mountain has lived long enough to listen objectively to the howl of a wolf.

This, then, is our challenge: to ponder what Leopold’s biographer, Susan Flader, calls the “hidden meaning in the howl of the wolf.” What is it that the mountain knows about the wolf’s howl that we do not? Why is it that when Leopold once shot a wolf and then watched “a fierce green fire dying in her eyes,” his worldview changed? What did he understand at that precise moment about what is lost to the world in the absence of wolves? And what did he then begin to understand about what the world gains when wolves reappear?

The End of Wilderness?

In *Of Wolves and Men*, Barry Lopez writes of the history of the eradication of wolves in the United States outside of Alaska. He asks the question: “When a man cocked a rifle and aimed at a wolf’s head, what was he trying to kill?” Lopez answers his

own question by suggesting that the extirpation of the wolf symbolizes the destruction of the American wilderness, the closing of the American frontier. According to Lopez, it was the transformation of wildlands into cultivated ones, that marked the “progress” of American civilization. Wolves were to wilderness as cattle and sheep were to farms and ranches. Neither could fare well in the absence of the other. As historian Roderick Nash concluded, “In the morality play of westward expansion, wilderness was the villain, and the pioneer, as hero, relished its destruction. The transformation of wilderness into civilization was the reward for his sacrifices, the definition of his achievement and the source of his pride.”

It was only when the end of wilderness and the end of the wolf were at hand that voices were raised in opposition to civilization’s relentless march forward. Much in the same way that Leopold saw something that unnerved him in the dying fierce green fire of the wolf’s eyes, so too did some Americans begin to see something that unnerved them in the disappearance of wilderness. What was that something? What prompted Henry David Thoreau to proclaim, “In wilderness is the preservation of the world”? And what prompted John Muir to fight his last breath to save Hetch Hetchy? What was it they understood that so many others didn’t and still don’t?

The Wolf Is an Indicator Species

The answer, it seems to me, must be in that same revelation that came to Leopold in the middle of this century. The answer must be in what he saw in the wolf’s eyes. Distilled into that one dramatic moment was the culmination of a lifetime of learning about the wolf’s place at the apex of the biotic pyramid, a large carnivore at the top of a diverse food chain that had taken millennia to unfold in its complexity. Leopold recognized, as did the poet Robinson Jeffers when he said, “What but the wolf’s tooth whittled so fine the fleet limbs of the antelope,” that the wolf’s presence symbolized a healthy, symbiotic nature and, conversely, that its absence foretold of a natural world in

distress. To Leopold, the howl of a wolf was reassurance that everything was as it should be, that everything was in its place. That, in his mind, was the hidden meaning in the howl of the wolf.

Plain Member and Citizen

But to suggest that Leopold's insight was limited to an acknowledgment of the wolf as an indicator species, does an injustice, I think, to the depth of his soul search. Of more telling significance is what else Leopold must have come to grips with when confronting his own role and, in a larger sense, humankind's role in jeopardizing the wolf and ultimately the balance of nature. Leopold must have experienced the guilt that comes with accepting responsibility for disrupting nature's delicate balance. These feelings, in turn, must have prompted him to rethink and subsequently redefine the role of our species from conqueror of the land-community to plain member and citizen of it. Leopold must have felt awful—that is, full of awe—when facing up to all that he had yet to learn about nature's workings. Fortunately for us, he sorted these feelings out eventually in *A Sand County Almanac*, a book that still, almost 50 years later, is considered the bible of the environmental movement.

Of What Use Is a Guilty Conscience?

It is not particularly fashionable to feel guilty about much these days. Guilt doesn't get us anywhere, people say. It's unnecessarily burdensome. Better to purge ourselves of the unwelcome baggage. Better to leave it behind. I wonder about that. So too does Wislawa Szymborska, the Polish writer and 1996 Nobel Peace Prize winner for literature, in her poem "In Praise of Feeling Bad About Yourself."

The buzzard never says it is to blame.

The panther wouldn't know what scruples mean.

When the piranha strikes, it feels no shame.

If snakes had hands, they'd claim their hands were clean.

A jackal doesn't understand remorse.

Lions and lice don't waiver in their course.

Why should they, when they know they're right?

Though hearts of killer whales may weigh a ton,

In every other way they're light.

On this third planet of the sun

Among the signs of bestiality

A clear conscience is Number One.

What Szymborska compels us to think about is what separates our species from the rest, what separates us from the rest, what distinguishes us. Her answer is clear. Guilt is a reminder that we humans are endowed with a conscience, a conscience that all too often has not been our guide. Feeling guilty is healthy feedback for a species that has an extraordinary capacity to effect change. It is restraining.

To speak of restraint is to usher us into the ethical realm, a realm alien to the likes of lions and tigers and bears. For ethics are a decidedly human endeavor; the exercising of free will, the distinguishing of right from wrong, the working out of what should and should not be done.

Ethics are also a work in progress. How we should conduct ourselves in relation to a world of living, breathing others is and always will be our principal homework. Stewing over such things, worrying about such things, feeling guilty about such things, reassures us that we are humane beings after all. Feeling otherwise, I fear, would make us less so.

We Are Nature Watching Nature

As we approach the 21st century, the wilderness of which Thoreau, Muir, Leopold, Lopez, Nash, and others have written is most assuredly dwindling. Indeed, in his book *The End of Nature*, Bill McKibben argues persuasively that there is no place on Earth that has not felt in some way the imprint of the human hand. Whether you agree or disagree with McKibben, or whether or not you find the disappearance of wilderness trou-

bling, I think we might all agree that wilderness has played a significant role in the unfolding of the American experience. "All America lies at the end of the wilderness road," said historian T. K. Whipple, "and our past is not a dead past but still lives on in us. ... Our forebears had civilization inside themselves, the wild outside. We live in the civilization they created, but within us the wilderness still lingers. What they dreamed, we live; and what they lived, we dream."

As I have written elsewhere, "The most significant thing about the American wilderness is that it is free. It is that place where we escape the bonds of social convention. It is that place where, unshackled, we recast ourselves each in our own fashion. It is that place where we build anew." Wilderness, in the words of Bob Marshall, "provides the ultimate delight because it combines the thrills of jeopardy and beauty. It is the last stand for that glorious adventure into the physically unknown"

Safeguarding what is left of America's wilderness is the right thing to do, I think. Not only for its scientific, aesthetic, and recreational value, but as testimony to the possibility for human restraint and ethical modesty, as a sign of compassion for our fellow mortals. In this regard, I am taken with environmental philosopher Max Oelschlaeger's proposition that humankind may be nature's way of keeping track of itself. The idea that nature could evolve a self-reflective organism that has the capacity to step outside itself, to reflect on its circumstances, and to change its ways when necessary, is wonderfully inviting to me. Could it actually be, as Oelschlaeger speculates, that we are nature watching nature?

We are at a critical juncture in defining the role of our species in shaping the future. We can continue indulging our appetites for more physical goods. We can continue our consumptive patterns. We can continue to make our presence felt. Or we can back off a bit, exercise restraint, and extend ethical consideration outward to other people, to other living things, and ultimately to the Earth in its entirety. I would like to think that we have the capacity to choose the latter path, and recent events make me cautiously optimistic.

According to newspaper accounts, U.S. Secretary of the Interior Bruce Babbitt had tears in his eyes when he assisted in the reintroduction of gray wolves into the Yellowstone ecosystem. A grown man. Can you believe it? I wonder what got into him?

Were they tears of guilt for being a member of the species most responsible for the extirpation of the wolf? Were they tears of joy for being able to right wrongs,

to correct injustices, to make injured things whole? Was he moved by the sense of privilege and obligation that comes with the recognition of our human capability to mend consciously the errors of our ways? Were they tears of delight, humility, or awe, in having helped reignite a fierce green fire in the eyes of an animal, a species, an ecosystem? Were they tears, then, of transformation? Do

you think Secretary Babbitt came to understand, as all of us hopefully will someday in our own way, the hidden meaning in the howl of the wolf? **IJW**

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ANTARCTIC TOURISM

A Frontier for Wilderness Management

BY GORDON CESSFORD

[*Editor's Note:* Antarctica is the largest contiguous area of wilderness on Earth. As inhospitable to humans as it may be most of the time, the Antarctic is nonetheless a vital and valuable area. The *IJW* is pleased to feature five articles on Antarctica in this issue, more exposure to one subject in one issue than we have given previously. Special thanks go to the efforts of *IJW* guest editors Gordon Cessford and Paul Dingwall of the Department of Conservation, New Zealand, for coordinating a comprehensive, up-to-date perspective on the great southern wilderness.

—Vance G. Martin, Executive Editor (International)]

Abstract: Antarctic tourism has grown rapidly in recent years, bringing an influx of new visitors to add to the traditional scientific occupants of the continent. To date, tourism impacts on the wilderness environment have been relatively benign, and tourists accept that their visits may be subject to limitations. But the prospect of continued growth and diversity of activities brings some concerns about the adequacy of existing rules for managing tourists and calls for continued surveillance and research.

DEBATE OVER WHETHER ANTARCTIC TOURISM IS GOOD OR BAD IS NOT MUCH HELP. It is internationally accepted as a legitimate activity, Antarctic tourist numbers are growing, and recently even a comprehensive Antarctic tourism guidebook has been published (Rubin 1996). All the signs show that Antarctic tourism is here to stay. Now the important discussion must focus on how tourism can be encouraged to operate in ways that minimize disturbance and further enhance the wilderness and scientific values already attributed to Antarctica. This may require determining how tourism activities take place on-site, promoting better interactions between tourism and the operation of scientific programs and stations, and identifying ways to enhance the experiences of tourists so they become stronger advocates for Antarctic conservation and science after their return home. To gain a perspective on how this could occur, it is helpful first to understand the current features of Antarctic tourism and tourists.

A visit to Antarctica is a unique and wonderful experience. Understanding Antarctica will tell us much more about the global processes affecting the world environment and our place in it, and a special regime of international cooperation is required to manage our interactions with Antarctica—it is not “owned” by anyone. Following is an Antarctic tourists response, when asked the main things she would tell other people about her Antarctic experience. It captures some of the key issues about Antarctica as a growing tourism destination and as a place valued by humans: “The vastness and peace. The importance of the Antarctic in determining climate, weather, and oceanic features in the rest of the world. The necessity of international planning and cooperation to protect this area.”

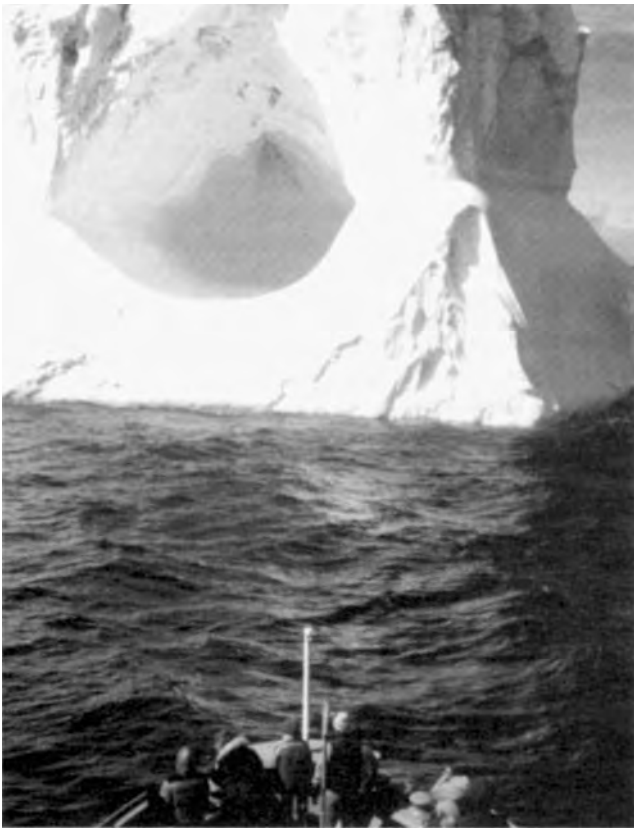
The Context for Antarctic Tourism

Although Antarctic tourism is growing rapidly, it is only a tiny fraction of the international tourism industry. While hundreds



Do tour vessels at heavily visited historic sites on the Antarctic Peninsula represent overcrowding? Photo by *Antarctica NZ*.

of millions of tourists travel internationally each year, numbers in Antarctica are now reaching 10,000 in the four-month summer season (see Figure 1). This may seem a small number for a wilderness continent larger than the United States and Mexico combined (14 million square kilometers), but visits are focused on only a few accessible natural and historic features. Most are in the less than 0.5% of the surface area (56,000 square kilometers), which is free of permanent ice and is an area equivalent in size to Denmark, Sri Lanka, or West Virginia. But the largest single ice-free area (the Dry Valleys) is only 2,500 square kilometers, approximately the same size as Yosemite National Park. The remaining ice-free areas are mainly mountaintops and coastal outcrops speckled widely over the vast Antarctic continent. Antarctica's sparse terrestrial life is highly concentrated on these rocky “islands” in a “sea” of ice, particularly in the coastal areas close to the



Seaborne tourists view an iceberg. Photo by Paul R. Dingwall.

life support provided by the sea. The direct human influences that occur in Antarctica are also highly concentrated in the more accessible of these ice-free coastal areas, including past and present scientific stations and current tourism activities. So while the continent is vast and the human numbers low, the interaction of people and environment occurs largely in the very limited ecosystems most important for the marginal life that exists. In this situation, the presence and behavior of even relatively small numbers of people take on added significance.

The Pattern of Antarctic Tourism

Human activity in Antarctica is overwhelmingly concentrated on the Antarctic Peninsula (see p. 23 of Dingwall article in this issue for map), which contains almost half of the 40 or so scientific stations in Antarctica, and over 90% of tourism activity (see Figure 2). In essence, Antarctic tourism consists of ship visits to the Antarctic Peninsula, combining scenic cruising with brief visits ashore to view unique wildlife and historic sites. Most Antarctic tourists voyage from Punta Arenas (Chile) or Ushuaia (Argentina) in vessels ranging from comfortable cruise ships carrying 400 or more passengers, to expedition-style yachts carrying fewer than 10. Most vessels between these extremes are chartered craft, especially a variety of ice-strengthened Russian research vessels and icebreakers, which have been converted for tourism use and carry 30 to 100 passengers. The availability of these vessels from the early 1990s and the increasing use of shipborne helicopters has significantly increased the volume and scope

of seaborne tourism options as well as the range of sites able to be reached. Due to ease of accessibility and the concentration of attractions on the peninsula, most future growth in all types of Antarctic tourism is likely to occur here.

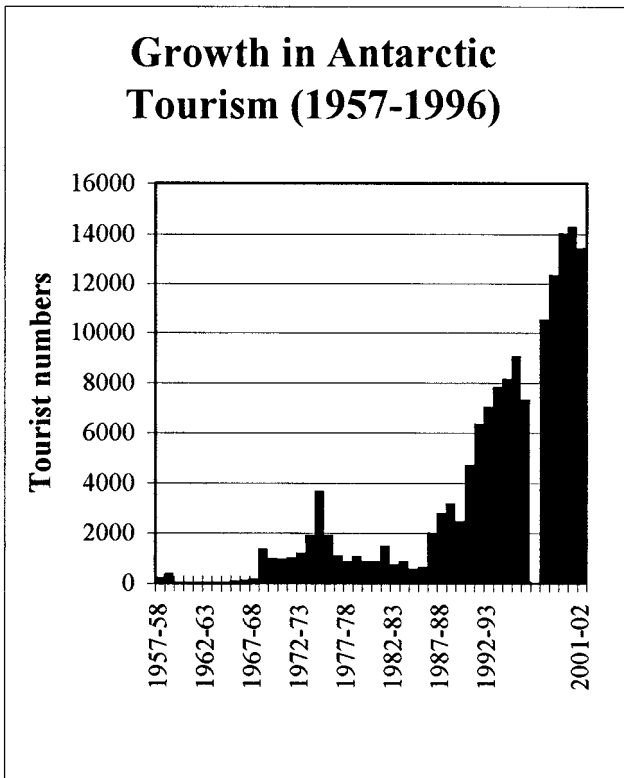
Smaller numbers of vessels travel from New Zealand and Australia to destinations mainly in the Ross Sea region, usually complemented by visits to the New Zealand and Australian Subantarctic islands (recently nominated for World Heritage status). This, however, involves about 10 days voyaging across the notoriously stormy Southern Ocean, compared with 3 to 5 days to the peninsula. The longer seetime raises travel costs, reduces the proportion of time spent ashore, is less comfortable for passengers, and limits the types of vessels that may safely visit (see Figure 2). In addition, there is often uncertainty about reaching some sites when ice conditions are unfavorable. It is unlikely that seaborne tourism to the Ross Sea will grow substantially in the next few years unless more voyages using Russian vessels become available.

Aircraft also travel from South America, usually carrying small numbers of adventure-oriented tourists to inland sites for climbing, skiing, and wilderness expeditions. Other opportunities for airborne access are currently being investigated elsewhere in the Antarctic, including trials of flights from South Africa (IAATO 1997). Antarctic sightseeing overflights from New Zealand were also proving popular before ceasing after a tragic crash in 1979. These have resumed recently from Australia and are again proving popular. Even when viewed from great height and at considerable expense, Antarctica is a highly attractive tourist destination, reflecting the commonly stated desire of people to visit it someday.

The Impacts of Antarctic Tourism

Any wilderness manager confronted with tourist demand for visiting rare and highly specific natural and historic features would have difficulty coping with a series of sites spread widely over a vast continent. Adding complexity is the lack of on-site management presence, the commercial pressures driving tour

Figure 1—Growth in Antarctic Tourism

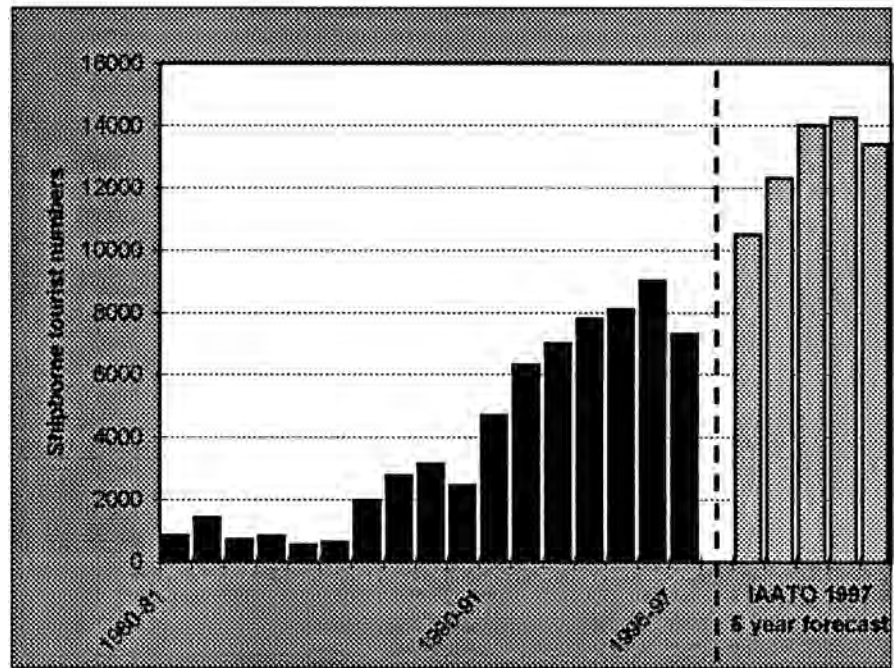


providers, and the lack of a clear mandate to make binding decisions. For those concerned about the continued viability of Antarctic ecosystems and the integrity of the many historic sites, the prospect of growing tourism numbers in these circumstances is not a welcome one. Tourists will inevitably have impacts, and these may be particularly acute because tourists specifically seek the most valued natural and historic features. People may try and get "just a little bit closer" for their penguin photograph; want to pick up that historic hut item for a closer look; souvenir "just a few" wind-sculptured stones; or walk "just a little" way into that specially protected area and maybe unknowingly trample unnoticed lichens, mosses, soils, or rock features.

However, the localized impacts of tourism on features at Antarctic sites should be seen in the wider context of natural environmental fluctuations, global and regional human activities, and the ongoing localized effects of station operations and science programs. Although tourists greatly outnumber scientists, Headland (1994) compared the relative tourist and nontourist "presence-days" in Antarctic environments (i.e., how many people were present, what they were doing, and for how long), and estimated that less than 1 % of direct human effects in Antarctica could be attributed to tourists. This does not mean that tourism impacts should be ignored, as they add to the cumulative effects of stations and science programs (see Dalzeill and De Poorter article in this issue), but shows that there should be a focus on station operations when prioritizing actions to reduce human impacts. Tourist impacts should be subject to exclusive focus only where they particularly threaten the natural and/or historic values. In the vicinity of existing stations, it is unlikely that environmental impacts from tourist activity would be more significant than those associated with the station.

The most pervasive impact from tourism has actually been on the operation of the stations themselves. Tourists display a particular interest in station visits, which are usually seen as an integral part of the Antarctic experience. In positive terms, this provides welcome

Figure 2—Seaborne Tourist Increases in Antarctica and 5-Year Forecast for Continued Rise in Numbers



changes in station routines, allows more direct advocacy of the research being done to an interested audience, provides opportunities for generating revenue from postal and souvenir services, and has enabled greater logistical cooperation between station and tour operations. In some cases, tour vessels have provided transportation of staff and materials for management and research purposes.

As the number of tourist visits has increased, however, the physical disturbance of station operations and scientific programs has become particularly acute at stations on the Antarctic Peninsula. Some stations now impose limits on visits allowed, or at least require considerable advance notice and visitor adherence to strictly enforced codes of conduct while ashore. This provides the control required to ensure that both the tourists and the managers can obtain the benefits of station visits, without seriously compromising station operations. This outcome can be achieved for station visits because of the on-site presence of management authority, and its acceptance by both tourists and tour providers. Achieving the same outcome at those sites where no

direct management control by official authorities is possible represents the main challenge for Antarctic tourism management. But how does one stop tourists from going closer to get that penguin photograph when there is nobody there to inform them?

Managing Antarctic Tourism Impacts

Part of the answer to this question lies with the tourists themselves. A high degree of Antarctic interest and motivation is suggested by their choice of an Antarctic trip in the first place. They are making an expensive choice compared with other tourism options, and in most cases they are accepting the probability of experiencing considerable discomfort at sea for relatively short visits ashore. Coming from the more affluent and better educated sectors of society (predominantly from Europe and North America), generally being from older age groups, and mostly having professional and managerial backgrounds, these tourists have high expectations of quality visit-experiences, featuring spectacular scenery, fascinating wildlife, and significant heritage in a wilderness context.



A tourist interacts with emperor penguins. Photo by Antarctica NZ.

The few studies made of Antarctic and Subantarctic tourists have indicated that these high expectations are being achieved. Furthermore, research conducted by Cessford and Dingwall (1996) found that there was a high degree of tourist acceptance of the regulations imposed for controlling visits ashore and no real demand for development of any visit-related facilities. Apart from some interest in provision of toilet options while

environmental messages managers may wish to convey. In essence, there do not appear to be any significant "customer-demand" pressures on tour operators to undertake their tours in ways that might seriously compromise Antarctic wilderness values or ecological integrity.

Because almost all Antarctic tourism visits are on self-contained ships, there is no need for any onshore facilities. This removes the main source of most pos-

How do you stop tourists from going closer to get that penguin photograph when there is nobody there to inform them?

onshore, a need that all public space and wilderness managers would recognize, the only notable developmental preferences expressed were for enhancing the already extensive interpretation and information opportunities associated with visits. In general, it appears that in many ways Antarctic tourists are already particularly receptive to the need for some regulation of visits ashore, to the types of regulations managers would wish to apply, and to the types of conservation and

sible impacts from human activity at sites, and places the focus more specifically on simply minimizing the effects of the brief site-visits. In turn, this requires more specific and localized tasks for research and monitoring related to impact assessment and site management. To achieve the best management of sites, more understanding of specific human-environment interactions is required. For example, how do different wildlife species perceive the repeated presence of hu-

mans, and what are the long-term consequences of their short-term behavioral responses? While recognizing that there is much to learn, and acknowledging the vulnerability of the values involved, there is still a need to provisionally establish some working guidelines.

Substantial progress has been made toward achieving site-management guidelines. On the one hand, nations administering activities in Antarctica under the Antarctic Treaty have adopted the Madrid Protocol, which provides a system under international law for environmental management of all human activities in Antarctica (see p. 22 of Dingwall article in this issue). While not distinguishing between different types of human activity, the Protocol does provide a basis for treaty nations to develop their own management policies specific to Antarctic tourism. For example, New Zealand recently passed domestic legislation providing for regulations and guidelines governing visits to the Ross Sea region (anon 1997). In this situation, New Zealand has extended its ability to promote these regulations by requiring that an official government representative accompanies each visiting ship. While this requirement can be legally enforced in New Zealand's Subantarctic island territories, in the international realm of Antarctica it can only be achieved through mutual agreement between authorities and operators. To date this arrangement has worked well, despite the costs involved for both parties. The managers establish some oversight of visits, while the operators achieve a greater measure of official endorsement, and sometimes the added interpretive services of an experienced professional.

On the other hand, the International Association of Antarctic Tour Operators (IAATO), which includes almost all Antarctic tour operations, has also developed its own bylaws, codes of conduct, and visitation guidelines. Thus, in most cases, visits to Antarctic sites will be controlled by groups under the supervision of experienced guides who are applying established visit protocols. This enables visitors to enjoy an informative, interesting, and safe experience, while avoiding sensitive areas or inappropriate behaviors. These voluntary codes and guidelines also

extend beyond the normal competitive behaviors of business, going as far as including cooperation between different tour operations to minimize visit congestion at particularly popular sites.

Conclusion

Clearly, a growing consensus between tourism and management interests, combined with the willingness of most tourists to accept environmental controls on their visits, is an encouraging basis for

achieving an environmentally sustainable tourism industry in Antarctica. Following the precautionary approach represented by the Madrid Protocol and IAATO initiatives, the working rules represented by the developing guidelines can continue to be applied as the best practices available. But ongoing research, monitoring, and consensus are still required in order to continue improving our understandings of the impacts and, if necessary to further refine these working rules. **IJW**

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SOCIAL AND ECOLOGICAL MANIFESTATIONS IN THE DEVELOPMENT OF THE WILDERNESS AREA CONCEPT IN NEW ZEALAND

BY JOHN SHULTIS

Abstract: Wilderness, like national parks, is an American innovation that dispersed to New Zealand soon after its original foundation. While the philosophies behind the establishment and management of national parks has remained consistent in Western nations, the conception of wilderness areas has begun to develop in unique directions in New Zealand. With the wilderness policy of 1985, the New Zealand government applied more stringent criteria that eliminated “developments such as huts, tracks [trails], bridges, signs, and mechanized access.” This paper discusses the new concept of designated wilderness in New Zealand and outlines the social and ecological antecedents of these changes.



Article author John Shultis.

LIKE THE EARLIER CONCEPT OF THE NATIONAL PARK, the American concept of wilderness has dispersed throughout the world, particularly in temperate nations settled by the British. Countries such as Australia, Canada, New Zealand, and South Africa have all begun to expand the acreage and number of designated wilderness areas in their territories.

This article outlines the origin of the wilderness area concept in New Zealand, discussing the country's modifications of the wilderness area concept in the mid-1980s, and the biogeographical evolution

and human settlement that have had important implications upon the perception of the indigenous landscape.

From Gondwanaland to Aotearoa to New Zealand

Approximately 80 million years ago, the islands of what is now known as New Zealand broke away from Gondwanaland and

began to drift away from the super-continent in an easterly direction. One of the most conspicuous outcomes of the resulting biogeographical isolation was the evolution of a high number of endemic species, particularly in bird and insect populations. Whereas earlier, more primitive species in less isolated land masses were slowly replaced by competitors better adapted to changing environmental conditions, in New Zealand these atavistic species—evolving at a much slower rate and in less conventional directions—continued to flourish (Burns 1984). Most notably, these islands evolved without the presence of mammalian predators: the only native land mammals are three species of bats. Many indigenous species have since been exterminated by the activities of humans (the first mammalian predators to invade the islands), particularly through hunting pressure, landscape modification, and competition with introduced species (Salmon 1975; Veblen and Stewart 1982).

Present-day New Zealand remained completely isolated from human influence until approximately 1,000 years ago, when Polynesians began to make what is thought to have been a series of migrations to the land they came to call Aotearoa (Davidson 1984; Biggs 1990). The Maori had considerable impact upon the New Zealand landscape (Orbell 1985). Approximately 30 avian species became extinct (Veblen and Stewart 1982; Cassels, 1984; Atkinson 1989), and from one-third (Nicholls 1980) to one-half (McGlone 1989) of the original forest cover was cleared by approximately 1800.

Nevertheless, the arrival of Europeans in Aotearoa heralded even more significant changes for the New Zealand landscape.

(Peer Reviewed)

Though first sighted in 1642 by Abel Tasman, sustained European settlement did not begin until 1788, the year New Zealand formally fell under the jurisdiction of the newly formed New South Wales colony in Australia.

The Development of Protected Areas in New Zealand

In 1840, the signing of the Treaty of Waitangi cleared the way for organized British settlement of New Zealand. Just one month after the Treaty of Waitangi had been signed, the Royal Navy requested that suitable areas of kauri forest in the Northland region be set aside for naval use before further settlement of the area took place. However, the Colonial Land and Immigration Office opposed the establishment of forest reserves, as they perceived them to be incompatible with settlement. Eventually, a national system of forest reserves was established through the New Zealand Forests Act (1874) and the Land Act (1877). In 1881 the Thermal-springs Districts Act was passed, which allowed the government to reserve hot springs and related features for recreation and tourism purposes: an excerpt from the Yellowstone park legislation was quoted during discussions of the Bill (New Zealand Parliamentary Debates, 1881, vol. 40) to help elucidate the principles behind the protection of natural features for park purposes.

New Zealand was the fourth country in the world to establish a national park. The nucleus of present-day Tongariro National Park was decided to the New Zealand government by the Maori chief Te Heuheu Tukino IV in 1887, and enabling legislation was passed in 1894. The delay was due to confusion over the concept of the national park, and concern that the area was suitable for settlement or resource extraction (Shultis 1992). One member of parliament attempted to alleviate these concerns using typical New Zealand imagery: he “pitied the unfortunate sheep that had to try to get a living out of [the proposed park area]” (New Zealand Parliamentary Debates, 1893, vol. 79).

As these early parks were primarily seen as tourist resorts, where possible the wilderness was “improved” with facilities suitable for the establishment of tourist resort desti-



A typical scene in Fiordland National Park, the park that best typifies New Zealand wilderness. Two designated wilderness areas—Glaisnock and Pembroke—are found within this park. Much of the park remains de facto wilderness. Photo by Arnette Browne.

nations catering to the upper classes. While in theory the lands and biota within park boundaries were subject to varying levels of protection, in actuality parklands proved to have little defense from unauthorized exploitation apart from their remoteness and their “worthlessness” for anything other than recreation and tourism.

areas as being of little use for recreation, though perhaps of some use for search and rescue training operations (Tararua Tramping Club Collection, unpublished).

The concept of wilderness areas gained momentum when Lance McCaskill, a celebrated advocate of protected areas in New Zealand, visited the

As opposed to wilderness areas in the United States, Canada, and Australia, wilderness areas in New Zealand have become much more stringently defined: areas designated as such “will not have developments such as huts, tracks, bridges, signs, nor mechanised access.”

The Evolution of Wilderness in New Zealand

The idea of providing wilderness areas in New Zealand was first discussed in the 1930s, soon after activity to protect wilderness in the United States occurred. However, the Federated Mountain Clubs (FMC)—the most influential of all non-governmental groups lobbying for the establishment and management of protected areas—tended to conceive of these

United States in the late 1940s to study managerial techniques utilized in American protected areas (Molloy 1983a; Thorn 1987). McCaskill discussed the concept of wilderness while visiting Leopold and other American advocates of the wilderness concept. But it was the visit of Olaus Murie, then president of The Wilderness Society in the United States, that provided the crucial impetus to the establishment of designated wilderness areas in New Zealand. In addresses to the Auckland and

Table 1: Wilderness Areas in New Zealand

National Park Wilderness Areas	Hectares	Acres	Year Established
Glaisnock (Fiordland National Park)	124,800	308,260	1974
Pembroke (Fiordland National Park)	18,000	44,500	1974
Tasman (Kahurangi National Park)	86,946	214,800	1988
Wilderness Areas			
Hooker/Landsborough	41,000	101,300	1990
Raukaumara	39,650	98,000	1988

Total: 310,396 hectares; 766,700 acres

Source: 1993 United Nations List of National Parks and Protected Areas (http://www.wcmc.org.uk/cgi-bin/un_list.pl); Les Molloy [personal communication, September 27, 1996].

Christchurch branches of the New Zealand Geographical Society in 1949, Murie expressed his dismay over the chaotic state of national park administration in New Zealand and discussed the American experience with wilderness areas (McCaskill 1949). A recent popular history of New Zealand's national parks states that Murie provided a "direct American input" into the appearance of a section dealing with wilderness areas in the 1952 National Parks Act (Thorn 1987). McCaskill himself stated that the concept of wilderness areas was "introduced to New Zealand by Olaus Murie" (McCaskill 1965).

Similar to the earlier national park concept, the provision of wilderness areas was made possible by the American

precedent and mirrored the American conception of wilderness areas and wilderness recreation.

Since the 1970s, the FMC had been tenaciously lobbying for changes in the legislative concept of wilderness areas. Les Molloy of the FMC spearheaded this sustained effort that finally culminated in the FMC silver anniversary wilderness conference and the consequential establishment of the Wilderness Advisory Group in 1981 (Molloy 1983b).

The resulting Wilderness Policy (WP), established in 1985, provided an altered version of the vision contained in the 1952 and 1980 National Parks Act (NPA) and an earlier joint policy produced by the National Parks Authority (NPAu)

and the Forest Service (FS) in 1980. Wilderness areas were now to be preserved and perpetuated in their natural state, with only minimal signs of human interference tolerated. The continuing affinity with the American wilderness system was reflected in the wording of the definition of wilderness, much of which (as in similar Canadian legislation and policy) reveals a marked resemblance to phrases contained in The Wilderness Act passed by the United States Congress in 1964. However, unlike the 1952 and 1980 NPA, foot tracks were now specifically prohibited in designated wilderness areas. Where such facilities such as huts, tracks, bridges, and route markers existed, they were to be "removed or no longer ... maintained" (Wilderness Advisory Group [WAG], 1985).

This new policy, endorsed by both the NPAu and the FS, signaled a significant alteration of the wilderness concept among the FMC, other lobbying groups, and government officials. As opposed to wilderness areas in the United States, Canada, and Australia, wilderness areas in New Zealand have become much more stringently defined: areas designated as such "will not have developments such as huts, tracks, bridges, signs, nor mechanised access" (WAG 1985). Where such facilities—still considered "improvements" in other protected areas—exist, they are required to be either removed or allowed to weather and age until consumed by the elements. Buffer zones between road access and wilderness boundaries are also encouraged. Thus, wilderness areas in New Zealand have become more strictly geared toward the actual preservation of relatively unmodified landscapes than in other countries. Though recreational use of wilderness is welcomed in New Zealand, it is neither actively encouraged (through the identification of wilderness areas in national park/ topographical maps) nor facilitated (through the traditional establishment of vehicular access and recreational facilities such as huts, tracks, bridges, and signs).



Manuka forest in Tongariro National Park. When this picture was taken in 1988, the area was within the Hauhangatahi Wilderness area. However, in the mid-1990s, this and two other designated wilderness areas were reclassified as remote experience zones, as they did not meet all the criteria contained in the 1985 Wilderness Policy. Photo by Arnette Brown.

Wilderness areas designated after the establishment of the WP in 1985 were normally larger, had fewer existing recreational facilities, larger buffer zones, and were more likely to incorporate ecological principles than earlier wilderness areas. Indeed, as stipulated in the WP, Otehahe, Te Tatua-Pounamu, and Hauhungatahi wilderness areas were later downgraded to “remote experience zones,” as they did not conform to required standards (principally minimum size). Table 1 lists the designated wilderness areas existing in New Zealand as of 1996.

Social and Ecological Manifestations in the Development of Wilderness Areas in New Zealand

The reasons behind the New Zealand transformation in the concept of wilderness areas are: (1) first and foremost, the strengthening of the New Zealand identity. New Zealand, like other excolonies, has developed a more robust national identity one familiar to itself and to other nations; (2) development of the environmental movement; and (3) the growing influence of ecological principles in the management of protected areas. These are both international and national trends. While the field of ecology is not strictly a 20th-century phenomenon (Worster 1977), the second half of the 20th century has seen an explosion in its scientific significance and public awareness (Bramwell 1989). In New Zealand, the field of ecology is particularly significant because of the high number of endemic species and the endangered status of many native animals, a result of its bio-geographical isolation and the enormous impact of introduced species. The instability and singularity of the New Zealand terrestrial ecosystem is much more conspicuous than in North America or Europe. In this way, the idiosyncratic biogeography of New Zealand has had a decisive impact upon the way in which the New Zealand wilderness is perceived by its citizens.

These three primary factors—the strengthening of the New Zealand identity, the growth of the environmental movement, and the increasing importance of ecological principles—provided much of the basis for the change in the



In 1983 a large part of Stewart Island was proposed for wilderness status by the FMC. This and other proposals have not yet been acted upon. Despite the importance of marine landscapes in New Zealand, no wilderness areas currently incorporate this landscape.

New Zealand concept of wilderness during the 1970s and 1980s. Secondary reasons behind the change is the belief in New Zealand that remaining indigenous species are of greater value than exotic species. Plants or animals that best typify or support the national identity, and that highlight the uniqueness of New Zealand (the kauri, kiwi, or kakapo, for example) are more valued than species that do not have these characteristics. The precarious existence of such indigenous species as the Chatham Island robin, kakapo, kiwi, and tuatara have helped ignite public support and sympathy for these animals. Similarly, research based upon ecological principles has emphasized the destructive power of introduced species such as rats and deer on indigenous species and landscapes. Also, both the New Zealand public and government agencies have become more comfortable with unmodified (wilderness) environments. The strengthening of the New Zealand identity has led to increasing identification with and pride in so-called “typical” New Zealand landscapes and species, which in turn has resulted in the increased affection for the unmodified, uniquely New Zealand environment (i.e., wilderness).

Conclusion

Beginning in the early 1970s, and culminating in the mid-1980s, policy makers

began to envisage a new more indigenous conception of wilderness areas. The strengthening of the New Zealand identity and increased public knowledge about endangered indigenous landscapes and species are deemed largely responsible. Increased support for unmodified representative New Zealand landscapes was also necessary for the recent more stringent modification of the wilderness area concept. As recreational and commercial pressures increase over the years, it remains to be seen if New Zealand bureaucrats and politicians will be content to allow these relatively undisturbed wild-lands to remain as designated wilderness areas. The laudable goal of creating these tiny islands of primordial New Zealand, largely unvisited, but still deeply valued representations of the original New Zealand landscape and the contemporary national identity, may be considered as yet a largely unknown and uncontested ideal. **IJW**

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MAINTAINING WILDLIFE NATURALNESS IN WILDERNESS

BY DICK CARTER

Abstract: Naturalness and wildness. The keys to what is most valuable about wilderness are directly threatened by recent U.S. Forest Service (USFS) wildlife and wilderness management policy changes with respect to stocking non-native fish species in wilderness waters and the introduction of non-native wildlife to wilderness lands.

AS SNOW DRIFTED THROUGH THE SKY on the edge of the High Uintas Wilderness in 1989, Tom Lyon, noted naturalist, longtime wilderness advocate, and professor of English at Utah State University, spoke these words at the fifth anniversary of the Utah Wilderness Act:

We suddenly realize that the world has nothing more precise, more worth saving, more worth fighting for, than the song of one hermit thrush, or the quick appearance and flowing disappearance of one marten, or the way the sunlight looks on the deep brown velvet of a moose's rack. These things are alive to us now, and uncannily potent in their wildness, because our wildness is coming alive. One of the great powers, one of the great gifts, of wild country is to restore this birthright attentiveness (Lyon 1989).

Roderick Nash (1973) notes the word "wilderness" literally translates into "a place of wild beasts." Leopold (1949) wrote a benediction, often overlooked, but of profound importance, for the last grizzly shot in Arizona: "Mt. Escudilla still hangs on the horizon, but when you see it you no longer think of bear. It's only a mountain now."

Wildlife makes wilderness worth preserving. It reminds us in the plainest terms that we are living with, not at the expense of, other creatures. But managing wilderness (designated or not) let alone wildlife in wilderness, is a paradox. Such a concept implies forcing a modern and planned human system into a chaotic and untrammelled wild place. Controlling wilderness (wildness) is the purpose of management, precisely the arrogance that destroys wilderness (wildness). Maintaining naturalness and solitude should be the focus of wilderness management (Hendee, et al. 1990).

At the same time, wilderness does not exist in a vacuum. Songbirds head south, ungulates head down, wolves follow them, and native cutthroat trout swim up and down only to meet non-native rainbow or brook trout. And research has shown that few natural areas in the lower 48 states are large enough to singularly harbor wolverine, grizzly bear, and others within their boundaries (Newmark 1987; Newmark 1995; Noss and Cooperrider 1994; Noss, et al. 1996).

Wildlife Management in Wilderness

Thus the question becomes, "What kind of wildlife management in wilderness?" While direct habitat manipulation is largely prohibited in wilderness, game and fisheries management has escaped close inspection. Many of our wilderness areas are full of non-native trout raised in fish hatcheries and introduced to wilderness streams at the expense of native trout and amphibians that don't compete well with the introduced species (Bahls 1990; Duff, 1995; Knapp 1996; Murray 1994). Hunting and trapping pressures vary, but often the focus is on hunter and angler success.

The Wilderness Act (TWA) (PL. 88-577, 1964) seems clear. Wilderness is defined as a place "where the earth and community of life are untrammelled ... retaining its primeval character and influence ... which is protected and managed so as to preserve its natural conditions ... affected primarily by the forces of nature" Hunting and fishing authorized by state wildlife agencies are allowed, but not requisites. The overriding governance of the legislation is that wilderness must be untrammelled and human activities must be subordinate to the perceived natural life processes. Naturalness, primitiveness, and solitude dominate.



Article author Dick Carter.



Photo by John Hendee.

Unfortunately, most state wildlife agency programs require considerable human domination such as recreational-based non-native fish stocking, game production, introduction of non-native terrestrial species—such as mountain goat (*Oreamnos americanus*) in some Utah wildernesses—and predator control.

The purpose of wilderness should not be to maximize game management opportunities, but rather to secure wild environments for wild native species. Wildlife in wilderness should not be symbolic of our management prowess. Wilderness must be a refuge for wildlife where our efforts are directed at restraining our management and control. It is time to allow ourselves to be absorbed by wilderness and think like Leopold's mountain.

Wilderness and Wildlife Policy—Undesirable Changes

Regulations that implement wilderness and wildlife policy within the USFS, for example (see Hendee, Lucas and Stankey 1990, for a comparison of wilderness/wildlife regulations), have always set policy that recognizes state jurisdiction over wildlife, consistent with wilderness objectives that state “the forces of natural selection and survival rather than hu-

man actions determine which and what numbers of wildlife species exist” (USDA 1990).

While the idea that wildlife management must also protect wilderness values has always been espoused, it has not always been practiced. In fact, that policy seems to be unraveling. Many activities such as non-native fish stocking have literally evolved with the wilderness system and have helped promote the original context of wilderness as a primitive recreational resource. With growing recognition that wilderness also must play an important part in the preservation of ecological and biological diversity and integrity (Noss 1996), issues such as non-native recreational-based fish-stocking programs and big-game management have grown increasingly controversial.

In a dramatic change of policy the USFS emphatically stated in a September 6, 1996, memo from the chiefs office to regional foresters that because “states manage most resident fish and wildlife populations,” while the USFS “primarily manages habitats for wildlife and fish,” public wildlife policy decision making by the USFS will be confined only where a federal action will be met (USDA 1996).

On the surface this policy seems not so dramatic—there has always been a recognition that states managed wildlife activities such as hunting and fishing

(Wilkinson, 1985). The USFS has upped this context to mean wildlife, not necessarily wildlife management activities, but the resource itself. Because fish stocking, for example, is not generally a federal action, the agency may allow state wildlife agencies to continue stocking non-native fish in wilderness waters without the requisite analysis of the impacts of this long-term activity on indigenous aquatic species—not to mention the biophysical impacts upon wilderness environments resulting from intensive fishing pressure.

This emphasis comes at a particularly troubling time because of increasing concerns over recreational-based fish stocking. Management bias toward a recreational fishery over other indigenous aquatic species comes as no surprise. But the willingness of the USFS to disregard, as a matter of policy the connection between the critters and habitat is disconcerting. This disconnection at a policy and management level flies in the face of the often stated goals of ecosystem management: it defers meaningful issues to state wildlife managers who often have vastly different public input and review processes and management objectives. Though this policy does call for consultation and cooperation, and allows conflicts to be moved up through the USFS bureaucracy, it is important to realize that this new direction came from higher levels, raising questions and suspicions as to how conflicts will be resolved at local levels.

Fish Stocking and Naturalness

In Utah, for example, this issue prevails on the High Uintas Wilderness and surrounding roadless lands. As in most western states, the majority of high mountain lakes in places like the High Uintas were historically fishless (Bahls 1992). Most major lakes in the Uintas have in recent times been stocked with rainbow and eastern brook trout, both nonindigenous, as well as hatchery-raised cutthroat trout. Under USFS regulations (USDA 1990), those species are now considered native as they have survived (with incredible help from fish stocking programs) in their new environments. Conservationists have

long complained about this process, citing heavy recreational use by anglers in many lake basins, and more recently about concerns over nonindigenous fish stocking as it affects the inherent biological diversity of these aquatic systems.

In 1993, conservationists led by the Utah Wilderness Association proposed a Colorado River Cutthroat Trout Refugium consisting of the Yellowstone River drainage on the south slope of the High Uintas Wilderness (Utah Wilderness Association 1993). This proposal consisted of about 100 square miles of alpine, subalpine, and densely forested spruce and lodge-pole pine drainages and basins. Some pure Colorado cutthroat trout populations have already found hiding places within this huge area (Shiozawa 1993), though the area is routinely stocked by state wildlife managers. The proposal outlined fishing regulations that would have prompted the removal of non-native fisheries over a ten-year period and, because native Colorado cutthroat trout are sensitive to angling pressure, future fishing regulations would have focused on "see and release" or the more traditional "catch and release" policy. While many in the USFS privately supported this concept, the agency argued that it was up to the Utah Division of Wildlife Resources (UDWR), which noted the proposal went too far too fast (*Salt Lake Tribune* 1993).

Concurrent with this proposal, the two national forests managing the High Uintas Wilderness (Wasatch-Cache and Ashley) initiated a wilderness management planning process called Limits of Acceptable Change (LAC). (For a discussion on opportunity classes and the Limits of Acceptable Change see McCoy, et al. *IJW*, December 1995). Conservationists pursued the cutthroat trout refugium proposal through this effort with no success. The Utah Division of Wildlife Resources objected strenuously to that strategy, noting fisheries are the sole purview of state wildlife managers: "It is no secret that several members of the LAC committee openly desire to eliminate active management of fish and wildlife in the wilderness area. The LAC process is a tool being used by these individuals to attempt to diminish the divisions management authority and thereby accomplish their desires" (UDWR 1993). The USFS response? The draft environmen-

tal impact statement for High Uintas Wilderness management refused to entertain the cutthroat trout refugium concept, noting it was a state wildlife management issue requiring the preparation of a (yet-to-be-completed) memorandum of understanding between the USFS and the UDWR. In essence, this process sets wildlife policy for wilderness on federal lands and affects habitat therein, largely directed by the more narrowly focused state wildlife management agency, and is not subject to public scrutiny or involvement.

of the areas now harboring goats and proposed for goat introductions were designated as wilderness, thus subject to Wilderness Act guidance and USFS regulations, which note wilderness is to harbor indigenous species. Simultaneously, the concern over wilderness as a refugium for natural processes and biodiversity was growing.

While observing the prohibition against placing nonindigenous species directly into designated wilderness, the USFS in 1988 allowed the UDWR to in-

The purpose of wilderness should not be to maximize game management opportunities, but rather to secure wild environments for native species.

Mountain Goats and Wilderness in Utah

This issue is not confined to fisheries. The introduction of mountain goats into a number of high elevation landscapes in Utah has become exceptionally controversial. Most available scientific literature suggests goats are not native to Utah (Chapman and Feldhamer 1982; Johnson 1977; Rideout and Hoffman 1975; Zeveloff 1988). The UDWR acknowledges that while mountain goats were not found in Utah during the Holocene, Pleistocene mountain goats did exist in what is referred to as Utah. And existing habitats appear to be adequate for mountain goat survival (UDWR 1995). Aside from the "Pleistocene argument," the forest service and UDWR cite a USFS district rangers diary from the early 1900s in which he notes mountain goats were seen in the Uintas. However, additional corroboration, archaeological evidence, and an oral history, including hunting stories, of mountain goats in the Uintas or elsewhere in Utah are notably lacking.

Mountain goats were introduced into many Wasatch Front areas in the late 1960s, long before this was even perceived as an issue. However, with passage of the Utah Wilderness Act in 1984, a number

of the areas now harboring goats and proposed for goat introductions were designated as wilderness, thus subject to Wilderness Act guidance and USFS regulations, which note wilderness is to harbor indigenous species. Simultaneously, the concern over wilderness as a refugium for natural processes and biodiversity was growing.

While observing the prohibition against placing nonindigenous species directly into designated wilderness, the USFS in 1988 allowed the UDWR to introduce mountain goats in an area adjacent to the High Uintas Wilderness, the first controversial mountain goat introduction. It was opposed by conservationists, and it was widely acknowledged that these goats would migrate into the more suitable high elevation habitat of the High Uintas Wilderness. The goats came from Olympic National Park, with a warning to the USFS about introducing mountain goats in habitats and designated wildernesses in which they are not indigenous (Olympic National Park 1988). This warning was not heeded.

After years of often heated discussion, the USFS in 1994 finally agreed that a significant environmental analysis should be completed on the goat introductions in cooperation with UDWR and interested publics, prior to any future mountain goat introductions in Utah, particularly in designated wilderness. Unfortunately, this decision by Utah National Forest supervisors and the Inter-mountain regional forester was subsequently abandoned by new and radically departing USFS policy, which deemed it the state wildlife agency's responsibility to determine whether species are indigenous and where they should be transplanted or introduced (USDA 1995). This decision was followed by the separate and already noted September 1996

policy, which further restricted the USFS's ability to analyze and manage nonindigenous wildlife on public forest service lands, including wilderness. Furthermore, the USFS did not complete a statewide environmental analysis before allowing an August 1996 transplant of 15 mountain goats from the Tushar Mountains. The goats were relocated from the Fishlake National Forest to additional areas adjacent to the High Uintas Wilderness, this time without public notification. They were simply transported by helicopter from an area where they were overgrazing, and they were released.

Further transplants have been proposed by the UDWR for 1997, utilizing helicopters to catch mountain goats in the

with the UDWR and independent biologists to determine whether mountain goats are indigenous to Utah. Unfortunately, the mountain goat is now becoming an icon of a myopic view of wilderness that embraces the introduction of non-native species.

Wilderness Hunting and Fishing

Recreational hunting, fishing, and trapping have long been considered integral uses of wilderness and are legally allowed in areas administered by the USFS and the Bureau of Land Management. However, the U.S. view of wilderness is changing. The reorientation from a utilitarian view

regional foresters (USDA 1996), directed that because "states manage most resident fish and wildlife populations," while the USFS "primarily manages habitats for wildlife and fish," public wildlife policy decision making by the USFS will be confined to where a federal action will be met. This, combined with new USFS direction that dictates it is the states responsibility to determine whether species are indigenous—and thus where they should be transplanted or introduced (USDA 1995)—empowers western wildlife agencies who favor fish and wildlife stocking of non-native species to support recreational fishing and hunting. In Utah, the translocation of mountain goats to wilderness and adjacent areas where they are not native, long a contentious issue, seems a fait accompli.

Naturalness and wildness, seemingly mandated by TWA, and the key to what is most unique and valuable about wilderness, are directly threatened by stocking non-native fish species in wilderness waters and the introduction of non-native wildlife to wilderness lands. Questions about what is and is not native should be referred to qualified scientific committees for resolution, not to local managers responsive to hunting and fishing clientele. Management policy for federal lands should remain in federal control for the benefit of all Americans, and not be deferred to local state wildlife agencies who are most responsive to local consumptive constituencies.

Wilderness should be a refuge for wildlife without the penalties so often dealt by human insistence on controlling wilderness. Only then will we begin to understand the real difference between tame wilderness and the meaning of wildness. **IJW**

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Questions about what is and is not native should be referred to qualified scientific committees for resolution, not to local managers responsive to hunting and fishing clientele.

Mt. Timpanogos Wilderness and transplant them to the Mt. Nebo Wilderness. An environmental assessment analyzing the impacts of helicopters on wilderness values will be completed, but it will not focus on the real issue of concern—the translocation and introduction of nonindigenous mountain goats to wilderness.

A separate study has been proposed by the USFS to study the environmental impacts of the mountain goat populations introduced in 1967 on Lone Peak (designated as wilderness in 1978) and into Mt. Timpanogos in 1981 (designated as wilderness in 1984). This would be the first systematic study of mountain goat impacts on any Utah transplant sites. Studies were not proposed for the Mt. Nebo Wilderness or High Uintas transplant sites. By way of a memorandum of agreement (Ashley National Forest/UDWR 1996) for the Uintas introduction, the USFS has pledged to initiate habitat studies with the huge caveat, "as funds are available." The USFS has also suggested a scientific review in cooperation

of wilderness resources to a broader recognition that wilderness represents a living and changing ecosystem is altering our view of the world. Should wildlife and fisheries be managed for crop production within wilderness? The answer to this question raises additional questions such as: "Should salamanders be as important as rainbow trout?"; and "Should cougars be as important as elk?" Guidance is offered by existing USFS policy and established wilderness management principles. Those principles remind us that "natural processes must operate freely," that human benefits are secondary to "preserving wilderness character," and that "wilderness dependent activities" must be favored (Hendee, Lucas, and Stankey 1990; USDA 1990; USFS 1987). In wilderness, wilderness matters.

Summary and Conclusions

Recent policy changes by the USFS, transmitted in a letter from the chief's office to

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ENVIRONMENTAL MANAGEMENT FOR ANTARCTIC WILDERNESS

BY PAUL R. DINGWALL

Abstract: The most barren and inhospitable wilderness on Earth, Antarctica is of vital importance to humanity. Its rocks and enveloping ice sheet hold the keys to unlocking our planet's history; its huge landmass and surrounding seas exert great influence on the world's oceans and weather systems; its waters nourish vast quantities of marine life of growing importance as food for sustaining human societies; and its immense scenic beauty has the power to inspire and uplift those who visit it, and the many more who will never experience it firsthand. Today, however, in this, the world's last great wilderness, we face a monumental challenge: How can we safeguard the immeasurable conservation values of Antarctica in the face of mounting economic, commercial, and political interest in the region and its resources, and the attendant threat of environmental deterioration? Recent agreement among the countries who collectively govern Antarctica on comprehensive rules for environmental management holds great promise that the challenge can be successfully met.

ANTARCTICA IS A WORLD OF ITS OWN. It is the coldest, iciest, windiest, highest, and remotest of the world's continents, girded by the stormiest ocean. Equivalent in area to the United States and Mexico combined, it expands to more than double its size each winter as the surrounding seas turn to ice. The vast Antarctic ice sheet, on average 2,000 meters thick, stores about 90% of the world's fresh water—enough to raise the global sea level by 60 meters if all the ice melted. Ice covers virtually everything, and life on the few scattered patches of bare land is very impoverished. Only primitive forms of vegetation can survive—lichens, mosses, liverworts, and algae—and there are only two higher-level plants, a low-growing cushion plant and a small grass. The largest true land animals are two kinds of tiny wingless midges, while the sparse, stony soils harbor only small nematode worms and a variety of springtail insects. Life in the freshwater lakes is confined to tiny shrimps and other small forms of aquatic animals.

In contrast, life in the Antarctic seas is abundant. The nutrient-rich southern waters sustain a massive web of life, at the base of which are large numbers of plankton, which in turn sustain fish, squid, seabirds, seals, and whales. About half of the biomass of animal plankton is made up of just one species—the small crustacean, krill (*Euphausia superba*), occurring as vast swarms in surface waters. Krill is the staple food of the great whales, and the multitudes of seals, penguins, and other seabirds. The total population of crabeater seals, which are the most numerous of the six types of Antarctic seals, may be about 20 million individuals, while there are around 10 million breeding pairs of penguins (seven species) and in excess of 100 million pairs of albatrosses and petrels.

Human Interest in Antarctica

The history of human contact with Antarctica is a short one. The English navigator/explorer James Cook, who in the late 18th century was the first to penetrate the Antarctic realm, dismissed *Terra Incognita Australis* as “not worth the discovering,” though he reported the coast of South Georgia teeming with seals. Not surprisingly, it was sealers who first set foot on the continent in the 1820s, and they were followed in quick succession by whalers, explorers, scientists, and, in the last 30 years or so, by tourists. Scientist/explorers opened up the continent in the so-called “heroic era” around the turn of this century, but the major catalyst for scientific research was the International Geophysical Year of 1957–1958. This, in turn, gave rise in 1959 to the Antarctic Treaty, a unique international agreement among 12 nations who pledged to maintain Antarctica as a realm of peaceful scientific cooperation. When the Treaty entered into force in 1961, Antarctica became, as it remains today, the only significant region on Earth, apart from the high seas, governed under international law.

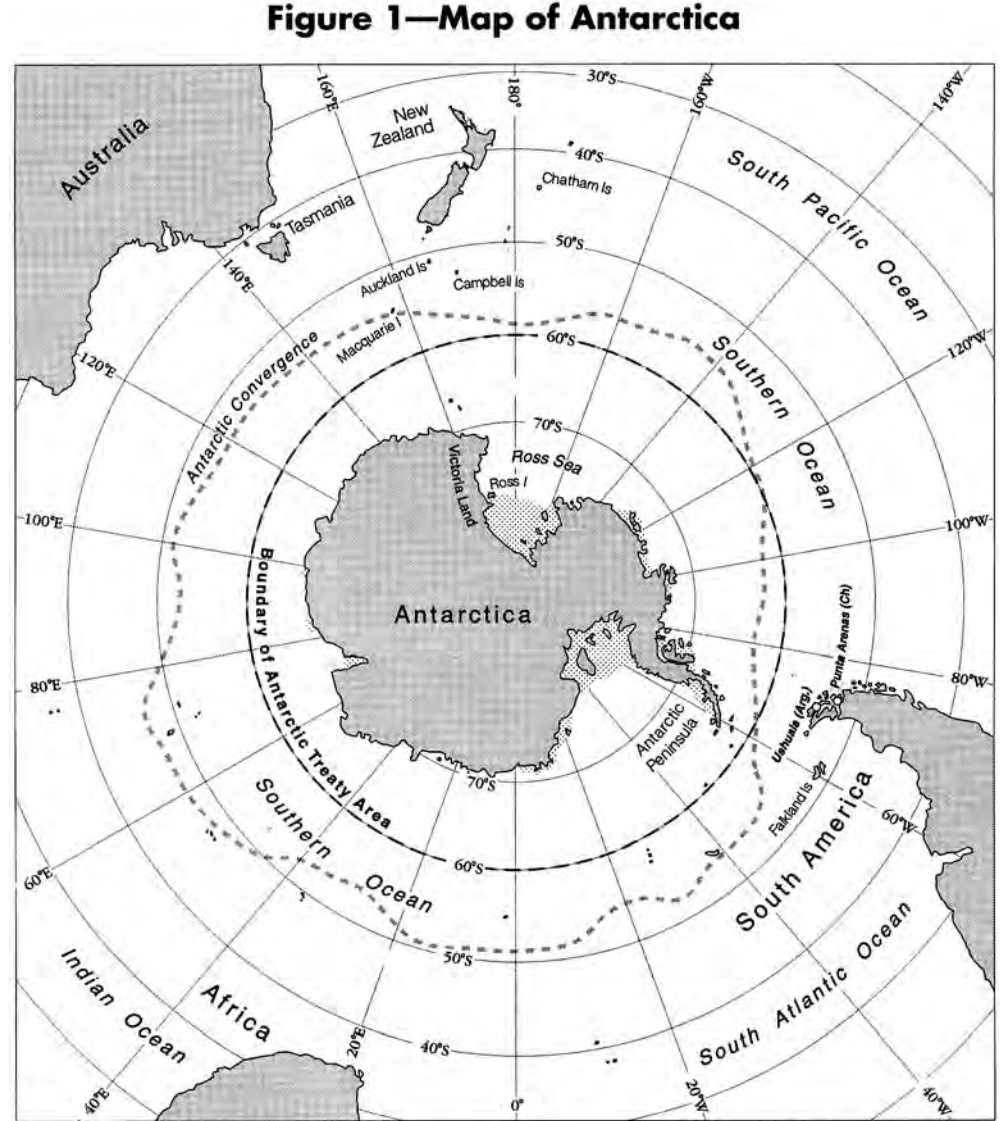
Today the number of treaty states has grown to include 26 Consultative Parties (who have active research programs in Antarctica and full decision-making powers) and a further 14 Nonconsultative (acceding) Parties. They meet together annually and make decisions, expressed as recommendations, by consensus. Treaty recommendations normally require enactment in domestic law to make them binding on citizens of the treaty nations. While the treaty covers all land and sea poleward of latitude 60 degrees south, the legal system was extended north into the Southern Ocean in 1980 by the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR), established to regulate sustainable fisheries in Antarctic waters. Similarly, the Convention for the Conservation of Antarctic Seals (CCAS) of 1972 provides regulations for management of commercial

sealing, should such activities ever resume. The Antarctic Treaty Parties are advised by a Scientific Committee on Antarctic Research (SCAR) established in 1958, while cooperative action and information exchange among national Antarctic research programs are promoted by a Council of National Antarctic Program Managers (COMNAP).

Human Impact on Antarctica

Located well beyond the frontier of permanent human settlement, Antarctica remains, for the most part, an untrammelled wilderness, but it is by no means pristine. Soon after it was discovered, Antarctica felt the onslaught of human exploitation, which first targeted the marine resources. In just a few decades of the early 19th century, Antarctica's fur seals were brought to the brink of extinction, and the subsequent onset of whaling in the 20th century saw stocks of whales exhausted one species after the other. Today, although the whales are protected by a moratorium on commercial harvesting and establishment of a hemisphere-wide sanctuary under international law, the recovery of whale populations may never be complete. In contrast, with the cessation of the sealing industry, Antarctica's fur seals have rebounded spectacularly to at least their pre-exploitation populations. From the late 1960s, new fisheries commenced in the Southern Ocean for the massive swarms of surface-living krill and for rock cod and ice fish. All these experienced the classic short-term episodes of "boom and bust," which are neither economically nor ecologically sustainable. Today the new target is the highly valuable Patagonian toothfish, and already there is evidence of excessive harvest, much of it taken illegally in breach of agreed catch limits set under CCAMLR.

On land, steadily expanding research programs have witnessed the establishment of more than 40 scientific stations, including buildings, airstrips, and other facilities, as well as increased ship and air traffic. A small but burgeoning tourist industry is adding to the traffic congestion, particularly around scientific stations, and raising concerns about cumulative human impacts. Local pollution from garbage and other disposed wastes



Antarctica is a world of its own. It is the coldest, iciest, windiest, highest, and remotest of the world's continents, girded by the stormiest ocean.

and fuels have been added to by pollutants such as DDT and polychlorinated biphenyls (PCBs), originating from distant industrialized areas. Of even more concern is the recognition that multi-source global pollution from chlorofluorocarbons and other chemicals causes serious depletion of stratigraphic ozone over Antarctica, and the impact of "greenhouse" gases on global warming may have a significant impact on the melting of Antarctic glaciers and ice shelves.

Taken together, these pressures and risks of environmental damage make the

case for urgent action to ensure that the wilderness qualities of the Antarctic region are not damaged by further uncontrolled human exploitation. The Antarctic Treaty nations took action accordingly.

Environmental Management

In 1991, on the 30th anniversary of the Antarctic Treaty, the governing nations of Antarctica introduced the most sweeping reforms in the treaty's history. In signing the Protocol on Environmental Protection to the Antarctic Treaty (the Madrid Protocol), the treaty parties declared Antarctica



Scientific station port facilities at McAAurdo Station.
Photo by Gordon Cessford.

to be “a natural reserve devoted to peace and science,” and committed themselves to the “... protection of the Antarctic environment and its dependent and associated ecosystems, and the intrinsic value of Antarctica, including its wilderness and aesthetic values” The wide-ranging provisions of the Protocol assemble and revise all existing environmental regulations under the treaty, and establish new rules applying to all human activities in the Antarctic. Significantly, the Protocol imposes a ban on mining in the Antarctic for 50 years. The Protocol also establishes some fundamental environmental principles; promotes cooperative planning and conduct of activities in the treaty area; establishes an institutional framework for implementing the Protocol; and specifies the legal obligations on the parties with respect to compliance, inspection, reporting, and dispute settlement, among others. Environmental rules are set out in a series of five technical annexes, dealing in turn with environmental impact assessment, conservation of flora and fauna, waste disposal, preven-

tion of marine pollution, and area protection and management.

Environmental Impact Assessment

All activities are subject to environmental impact assessment procedures, though differing restrictions apply, depending on whether a proposed activity is assessed as having less than or more than a minor or transitory impact. Activities with lesser impacts proceed through an Initial Environmental Evaluation (IEE) only, while those of greater potential impact undergo a Comprehensive Environmental Evaluation (CEE), which includes public notification, consultation among all Consultative Parties, and final approval at an Antarctic Treaty Consultative Meeting. Once an approved activity has begun, monitoring and reporting procedures must be set in place to determine whether or not an activity is being conducted in accordance with the CEE and the principles of the Protocol.

Conservation of Flora and Fauna

Rules established for conservation of native flora and fauna require that permits be obtained to authorize scientific collections, sampling, and any research activity that might cause harmful interference to plants and animals and their habitats. There are special provisions governing interference with a listed group of Specially Protected Species, and strict rules for avoiding the introduction to Antarctica of non-native species, parasites, and diseases. Controversially, this included a requirement for the removal by 1994 of all dogs from Antarctica, including the huskies traditionally used to pull the sleds of field expeditions.

Waste Disposal

The Protocol requires that the amount of waste produced, or disposed of, in the Antarctic be reduced as far as is practicable. Past and present waste disposal sites, including abandoned work sites, are to be cleaned up. Some materials, such as PCBs, nonsterile soil, polystyrene beads used in packaging, and pesticides (except for approved scientific or hygienic purposes) are prohibited in Antarctica, while others have to be removed, including radioactive materials, electrical batteries, excess liquid, solid fuels,

containers, rubber, lubricating oils, and plastics. Burnable wastes not removed have to be incinerated in ways that reduce harmful emissions, and open burning of rubbish is to be completely phased out by the 1998-1999 season. Sewage and domestic liquid wastes must not be disposed of onto sea ice or ice shelves, but may be discharged directly into the sea where conditions exist for rapid dispersal. Waste management plans, supervised by a designated officer, are required for all scientific stations and work sites.

Marine Pollution

Rules for preventing marine pollution are intended to reduce the impacts of ship operations on marine and littoral ecosystems by prohibiting discharges of oil, noxious substances, plastics, and all other garbage. Moreover, it is forbidden to discharge untreated sewage or food wastes (which must be passed through a grinder) into the sea within 12 nautical miles of the land or ice shelves—though small vessels such as yachts are exempted.

Area Protection and Management

Under the Antarctic Treaty all sovereignty claims are set aside, and ordinary rules of ownership of territory do not apply. Special protection and management provisions, however, are required for areas acknowledged as having significant natural, scientific, historic, or landscape values, or for areas where multiple uses might cause undesirable environmental impact or give rise to disruption between conflicting activities. Thus, the Protocol provides for designation of Antarctic Specially Protected Areas (ASPAs) to protect unique terrestrial or marine ecosystems, key wildlife breeding sites, and important historic sites, such as huts from the heroic era of exploration. Management plans are required for ASPAs, which may restrict access or the types of activities conducted in them, and permits are required to enter ASPAs. Similarly, Antarctic Specially Managed Areas (ASMAs) may be designated where additional planning and coordinated management of activities are required. Typical examples include areas where scientific stations, historic sites, research areas, and popular tourist landing destinations coincide, and there are risks from mutual

interference or cumulative environmental impacts. Management plans are also required for ASMAs, but entry is not controlled by permit. Considerable progress has been made already in systematically reviewing and redesignating as ASPAs the 55 existing protected areas and more than 70 historic sites, and several areas, such as Ross Island in the Ross Sea Region, are proposed for designation as ASMAs.

Future Requirements

The Madrid Protocol establishes an environmental management regime, which is as sophisticated as any comparable regime in any other major region of the world. But it is not yet complete.

Six years after its adoption the Protocol has still not entered into force, as there remains one Consultative Party, Russia, still to ratify it (though ratification is apparently imminent). Thus, the work done to date in implementing the Protocol has been undertaken on a voluntary basis by the treaty countries. A Transitional Environmental Working Group has conducted the work to be done eventually by the principal institution created under the Protocol—the Committee for Environmental Protection (CEP). This committee, representative of all Protocol parties, is to provide advice on, among others, application of environmental impact procedures, operation and elaboration of the protected area system, inspection and reporting procedures, collection and exchange of information, and the need for scientific research and monitoring. The committee is encouraged to consult as appropriate with SCAR and the scientific committee of CCAMLR, the heads of which are invited observers at meetings of the CEP. Other relevant scientific, environmental, and technical organizations, such as the United Nations Environment Program (UNEP) and the World Conservation Union (IUCN), may also be invited to participate as observers at meetings of the CEP.

Issues of compliance also remain incomplete. In particular, the rules and procedures to address liability for environmental damage and remedial response action have yet to be decided. Several special meetings of the Treaty parties have worked on the development

of an Annex on Liability for the Protocol, but an agreement on rules governing this complex, but vital, element of the regime remains elusive.

Some questions remain about the adequacy of the coverage of the Protocol. For example, the Protocol doesn't apply to activities carried out under other legal instruments of the Antarctic Treaty System, such as CCAS and CCAMLR, which govern sealing and fishing activities, respectively. Moreover, jurisdiction under the Protocol is confined to the Antarctic Treaty Area, bounded by 60

north into the Southern Ocean as the Antarctic Convergence—the natural outer limit of the Antarctic marine realm at 45–55 degrees south.

Nor is it clear whether the Protocol applies in the case of the sea floor, or whether jurisdiction of the seabed is confined to the International Seabed Authority under the UN Law of the Sea Convention. In a worst-case scenario, deep seabed mining for oil or other resources might be able to proceed legally in Antarctica despite the Protocols ban on mining.

There are special provisions governing interference with a listed group of Specially Protected Species, and strict rules for avoiding the introduction to Antarctica of non-native species, parasites, and diseases.

degrees south latitude; however, this area doesn't entirely encompass the natural feeding range of important Antarctic wildlife species, such as petrels and penguins. Given the Protocols aim to protect the totality of the Antarctic environment, including its dependent and associated ecosystems, there is a strong argument for extending the boundary of jurisdiction at least as far

Some concerns have also been expressed that the Protocol doesn't specifically address the management of tourism, which is the fastest growing human activity in Antarctica and, apart from fishing, the only commercial one. The Protocols provisions, in fact, apply to all human activities, but treaty countries that are either “gateways” for tourists to the Antarctic, or which have major



The unique ice-free Dry Valleys of Antarctica's Ross Sea region. Photo by Antarctica NZ.

tour companies organizing Antarctic expeditions, will be required to elaborate on the Protocol to provide rules to govern the growing tourist traffic. New Zealand, for example, has recently developed a set of guidelines and procedures for visitors to the Ross Sea Region, based on its own ratifying legislation, covering aspects of environmental impact assessment, notification and approval of activities, environmental codes of conduct, reporting procedures, and the placement of official government representatives aboard tour vessels (see p. 7 of Cessford in this issue).

Thus, there are several issues yet to be resolved before the Protocol is fully elaborated and firmly established as law, so that its implementation can begin in earnest. But it signifies recognition by the Treaty countries of the global significance

of Antarctica, and their commitment to environmental protection and sustainable use of its resources. The real test, however, lies ahead. In the face of an ever-increasing human presence in Antarctica and mounting pressure for use of its resources, can Antarctica remain wild and beautiful with its biota and landscapes intact? The promise of the Madrid Protocol gives much confidence for an affirmative answer.

IJW

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SUGGESTED READING

Bonner, W. N., and D. W. H. Walton, eds. 1985. *Key Environments: Antarctica*. Oxford, New York: Pergamon Press, 381 pp. (This remains among the best instructional texts on Antarctica).

Two of the few published sources of the Madrid Protocol are:

Verhoven, Joe, Philippe Sands, and Maxwell Bruce, eds. 1992. *Antarctic Environment and International Law*. London: Graham & Trotman, 228 pp.

Watts, Arthur. 1992. *International Law and the Antarctic Treaty System*. Grotius Publications, Ltd., Cambridge, U.K. (Hersch Lauterpacht Memorial Lecture Series 11) 469 pp.

ANTARCTICA'S CHALLENGE FOR THE 21ST CENTURY

Managing Cumulative Environmental Impacts

BY JANET C. DALZIELL AND MAJ DE POORTER

AS WE APPROACH A CENTURY OF HUMAN CONTACT WITH ANTARCTICA, the quantity and range of human activities in the frozen continent are rapidly expanding. While hardy adventurers are still emulating the Antarctic explorers of the “heroic era,” we now also see increasingly Caribbean-style seaborne cruises, the movement and storage of vast quantities of diesel fuel, the possibility of drilling into subglacial lakes millions of years old, the introduction of jet skis, and the filming of a tobacco advertisement.

To ensure that this ever-widening range of activities and players does not threaten the Antarctic wilderness, rules and regulations are increasingly being introduced in this, the world's last “unowned” continent. The Protocol on Environmental Protection to the Antarctic Treaty (Madrid Protocol) states that the protection of the Antarctic environment and dependent and associated ecosystems, and the intrinsic value of Antarctica (including wilderness, aesthetic, and scientific values), shall be fundamental considerations in the planning and conduct of all activities in the Antarctic Treaty Area. Accordingly, the Protocol provides for a process of environmental impact assessment as a key way in which potential impacts are identified in advance of an activity proceeding with the intention of avoiding or mitigating the impacts.

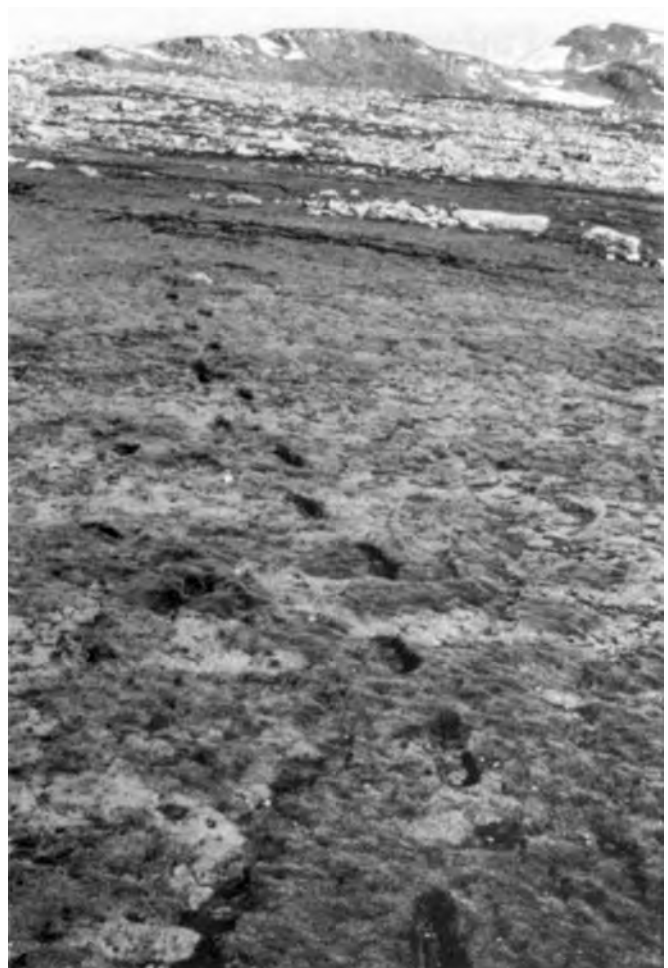
So far, so good. But in a continent where individual operators—both governmental and nongovernmental—run largely discrete and independent operations, and where each government considers itself sovereign within its own program, how can the whole range of activities in Antarctica be effectively managed to avoid or mitigate environmental impacts? Environmental impact assessments—done by individual operators for their own activities—do not offer mechanisms by which the additive impact of an activity, when combined with those of other activities, can be assessed.

In September 1996, the World Conservation Union (IUCN) organized an international workshop of invited experts to discuss and stimulate progress on practical aspects of minimization and management of cumulative environmental impact in Antarctica (De Poorter and Dalziell 1997). This article is based on the ideas and recommendations of direct use to Antarctic operators, policy makers, and scientists that emerged from the workshop.

The Fraught Question of Cumulative Impacts

Changes to the environment caused by human activities are not simply the product of individual impacts occurring indepen-

dently of each other but rather are the consequence of many interacting factors, the combined effects of which are not always well understood (Cocklin 1989). Human activities may produce environmental impacts that are considered insignificant, but the interaction and combination of these impacts over time and place may well be significant. This has sometimes been referred to as “the nibbling effect” or “destruction by insignificant increments” (Dupuis 1997). The existence of such cumulative impacts means that dealing only with individual environmental impacts will not result in adequate environmental management.



Long-term impacts from footprints in moss vegetation. Photo by British Antarctic Survey.

There are several components to the concept of cumulative impacts: (1) small actions whose impacts seem “insignificant” when viewed alone, can contribute to significant cumulative impacts when viewed along with other past, present, or foreseeable future actions; (2) larger-scale activities can produce a “stream” of impacts, and the totality of impact from actions includes indirect and secondary impacts and any activities or impacts that may be induced by the original activity (Dames, et al. 1981, quoted in Martin 1991); (3) the interaction of impacts can be additive or interactive (e.g., synergism, antagonism, biomagnification); (4) impacts may spread in time and/or space; and (5) several different operators maybe involved.

tive (e.g., synergistic, antagonistic, biomagnified).

Minimizing and Managing Cumulative Impacts

Workshop participants identified five existing mechanisms that provide opportunities for addressing cumulative impacts. Cumulative impacts can be assessed, managed, and avoided through: (1) use of the environmental impact assessment processes under the Protocol; (2) innovative use of existing area protection mechanisms; (3) improved information exchange and management; (4) increased international cooperation; and (5) specific and targeted research and monitoring.

assess the cumulative impacts of multiple activities over time and/or space.

Workshop participants agreed that in order to ensure that environmental impact assessments and reviews or audits better address cumulative impacts that: (1) wherever obligations regarding environmental impact are identified, it should be taken that this includes cumulative impacts; and (2) that environmental audits, along with monitoring programs, should be encouraged as a way of assessing cumulative impacts from existing activities.

Protected Area Mechanisms

Another major component of the Protocol is its system for designating Antarctic Specially Protected Areas (ASPAs), which restrict entry for scientific and/or protection reasons, and Antarctic Specially Managed Areas (ASMAs), which are areas subject to high and/or multiple uses. In both cases, management plans are the key to ensuring that the values of the area are protected. It is the ASMA category, however, which seems to offer a particularly good means of addressing area-specific cumulative impacts. Essentially, the processes of writing and operating a management plan for a multiple-use area will “internalize” the impact. By widening the scope of the activities being considered in a single plan, the likelihood increases that activities whose impacts are contributing to the overall impact are considered and managed within that plan. Permits are required to authorize activities in ASMAs, and, by providing a record of activities, they could contribute to better management of cumulative impacts.

Other ways in which protected area mechanisms could and should be used in the management of cumulative impacts include: (1) designation of short-term ASPAs to provide interim protection while long-term operations are developed; (2) identification of pristine or near-pristine areas and the setting aside of large areas to protect the integrity of remote regions; and (3) designation to allow time for recovery of areas degraded in the past.

However, it cannot be overemphasized that these mechanisms will only work effectively in a climate of strong and effective cooperation and communication among all operators in the area in question.

Effective and efficient exchange and management of information among operators is critical for the minimization of cumulative environmental impacts.

Although the existence of cumulative environmental impact has long been acknowledged, the formal study of it is relatively recent (Cocklin 1989, Damman, et al. 1995). The earliest Antarctic study specifically focusing on cumulative impact did not take place until the early 1990s (Martin 1991).

Definition of Cumulative Impact in the Antarctic Context

Workshop participants adopted the following definition of cumulative impact in the Antarctic context: “a cumulative impact is the impact of combined past, present, and reasonably foreseeable activities. These activities may occur over time and space.”

Cumulative impact may, for example, be the result of the repetitive occurrence of a single activity, the combined effect of multiple activities by one or several agents, or individually minor but collectively significant activities. Cumulative impact may be additive or interac-

Environmental Impact Assessment Processes

The Madrid Protocol sets in place a tiered system of environmental impact assessment as one of the primary means by which activities in Antarctica come under scrutiny. However, the system works on a project-by-project basis and does not immediately and obviously provide mechanisms for assessing cumulative impacts. Environmental impact assessment done jointly by governmental and/or nongovernmental operators could overcome some of the problems inherent in this piecemeal approach.

Another mechanism frequently employed by national Antarctic programs—although not required by the Protocol—is that of environmental reviews or auditing, where the environmental impacts of existing projects or programs are assessed. These studies are also subject to the same shortcomings with respect to cumulative impacts as are EIAs. However, they could, if constructed in the right way, be used to

Information Exchange and Management

Effective and efficient exchange and management of information among operators is critical for the minimization of cumulative environmental impacts. Those unfamiliar with Antarctica would probably be surprised at the difficulty faced in trying to build up a picture of activities that are taking place, or have taken place, in a particular location. On closer consideration, however, this is not so surprising, given the diversity of governmental and nongovernmental organizations that conduct activities in Antarctica, and the complete absence of a central repository for this sort of information.

Antarctic Treaty governments have developed some rudimentary forms of information exchange, but they are not geared toward the requirements of environmental protection and management. One of the outgrowths of this workshop was the recommendation that this system be reviewed in order to provide information more useful for these purposes. For example, there needs to be timely and frequent distribution of lists of completed and planned environmental impact assessments and permits issued, so that someone considering an activity can identify potential overlaps or conflicts.

Along with increased information exchange comes an ever-increasing call for effective systems of managing the information so that it can be accessed quickly and easily by those who need it. It was also suggested that in areas with multiple operators (e.g., where there are several stations) a common database of activities in the area would be very useful. Workshop members noted that it will not be possible to meet cumulative impact obligations without an effective data management system. This statement is easily made, but in practice such a system will require: (1) links with national Antarctic program data systems; (2) links with data from Antarctic scientists and operators; (3) consistency of data for comparability; (4) cost and cost effectiveness; (5) ensuring public access; and (6) global information systems (GIS).



Cumulative human impacts from scientific base facilities and tourist visits are evident in places such as this Adelie Penguin colony. Photo by Paul R. Dingwall.

International Cooperation

It is obviously preferable to avoid cumulative impacts from the start. A key way in which the overall impact of human activities in the Antarctic can be reduced is through a reduction in duplication of activities, particularly the logistical infrastructure.

As well as the clear benefits that accrue to the environment from different operators pooling their logistic resources (e.g., through sharing stations), a wider concept of international cooperation should also be considered. In particular, in areas of high and multiple-operator use, there is room for considerably more interoperator cooperation and even joint planning. It will not be possible for operators planning an activity to be able to assess and mitigate cumulative impacts unless they have full knowledge of activities conducted in the past and planned for the future by other operators in the area.

To address these needs, one could envisage regional planning and management groups composed of all those who operate in a given area. Such groups would jointly plan activities so as to avoid overlaps and conflicts, and would be able to foresee where, for example, multiprogram environmental impact assessment exercises would be useful. Such work might lead to tourist operators deciding to vary their routes, scientists choosing a

different study site, or two stations sharing new fuel facilities. It will also be important that all operators—even those that may not (yet) be inside the Antarctic Treaty System—plan and conduct their activities in the same spirit of international cooperation.

Further Research

Many aspects of cumulative impacts are not well understood, and a wide field of research is opened up by questions such as: “What are the mechanisms, pathways, and processes by which impacts accumulate,” and “Which parameters should be studied or monitored to measure impacts on wildlife?” For example, changes in population seem obvious, but other measures such as habituation of recruitment or age distribution may be just as important.

Long-term Challenges

In the long term, yet another level of complexity will need to be addressed. For example, the effect on dependent and associated ecosystems, including the marine ecosystem and Subantarctic islands, from Antarctic activities will have to be included in any assessment and management of cumulative impacts. The effects of activities outside Antarctica, such as global climate change and transboundary contamination, will also need to be tackled.

Management of cumulative impacts is undeniably a major challenge for those who have guardianship over Antarctica. Almost by definition, cumulative impacts are difficult to foresee and avoid or mitigate, but the obligations set by the Protocol mean that these are challenges that must be met. **IJW**

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ENVIRONMENTAL MONITORING

Measuring the Damage

BY DAVID W. H. WALTON

Abstract: The pure white of the snow is often assumed to imply that Antarctica is a pristine wilderness. Yet recently there have been increasing reports of how the continent is being seriously polluted. The truth lies somewhere between these extremes. Only through monitoring the changes occurring can the “environmental health” of Antarctica be established confidently. Recently, there has been a rapid increase in many types of environmental monitoring in Antarctica. Why is this, and what wider relevance does it have?

Human Impacts on Antarctica: Global, Regional, and Local

Global Impacts

In trying to understand changes in the world's environment we need to know what is natural and what is induced by our activities. The best place to measure the elements of change is a place free of industry and people—and Antarctica has no industry and very few people. Atmospheric mixing transports pollutants around the world and incorporates many of them in the snow falling on Antarctica, thereby providing a record of the atmospheric changes. The snow turns to ice, preserving an historical record stretching back almost 500,000 years. Analysis of these snow and ice samples has identified long-term patterns of change in the greenhouse gases CO₂ and methane, and recent changes in global levels of radionuclides (from atmospheric nuclear testing) and lead (from mining and leaded fuel). Combining these historical data with current daily atmospheric measurements enhances our ability to identify current trends in CO₂, CH₄, nitrogen oxides, and CFCs. For example, such measurements have already alerted the world to serious depletion in levels of atmospheric ozone. The Antarctic data provide the baselines against which changes in the rest of the world are measured.

There are also other global baselines established by Antarctic monitoring. Nobody uses pesticides in Antarctica, so measurements there can establish the baseline for global levels of these pollutants (Bidleman, et al. 1993). Organochlorine pesticides, polychloro-biphenyls (PCBs), and mercury have been clearly detected in penguins and petrels (Luke, et al. 1989), fish (Subramanian, et al. 1983), and even mosses and lichens (Bacchi, et al. 1986). Increasingly sensitive and sophisticated analytical equipment is even providing leads to where the pesticides might have originated.

Regional Impacts

There is detrimental impact on the Antarctic environment by the natural transfer of pollutants manufactured elsewhere. The next stage is to ask what changes are occurring, traceable to



McMurdo Scientific Station (USA), Ross Island, is the largest scientific base in Antarctica. Photo by Gordon Cessford.

human activities, at a regional level in Antarctica? There are three areas of concern—one on land and two in the sea.

On land the use of leaded fuel by aircraft has provided trails of lead contamination in the snow below the regular flight paths, as has the burning of leaded fuel in station generators (Wolff 1990). However, the extent of this problem is rapidly declining as newer aircraft are introduced and stations change to cleaner fuel. In the Southern Ocean the problems are associated with fishing and involve monitoring organized by the Convention for the Conservation of Marine Living Resources (CCAMLR). There is international agreement that the fisheries around Antarctica should be managed sustainably and in a manner that protects the integrity of the marine ecosystem. To check that catches are not too large, thus endangering the food supplies for seabirds and marine mammals, CCAMLR runs an international monitoring program that measures changes in the populations of indicator species. At present these include fur seals and four species of penguins (Adelie, chinstrap, gentoo, and macaroni) as well as Antarctic petrels and the blackbrowed albatross. The second area of concern is the increasing amount of marine litter found throughout the Southern Ocean. Plastic straps entangle fur seals (Croxall, et al. 1990), and plastic bags



Open burning of waste, now banned under the Madrid Protocol. Photo by *Artarctica NZ*.

and granules are eaten by birds, filling their crops and causing starvation. Regular surveys of particular beaches around the Antarctic, using a standardized recording format, document the amount and possible origin of the wide range of materials discarded overboard, mostly by the fishing fleets.

limited to the areas directly around the research stations, but concern has also been expressed about remote field camps, as well as the activities from research vessels. There is no doubt that at some stations with a long period of occupancy (in some cases over 50 years) there is evidence of activities undertaken in a less environmentally enlightened age (Lenihan 1992). Carefully angled photographs and a degree of media hype have drawn attention to waste dumps at several stations, which do need serious attention, but these waste dumps are highly localized and are not significant sources of continental-scale pollution.

Today, with a much heightened responsibility for a clean environment, these historical rubbish dumps are gradually being removed. Far more important is the change in mentality brought about by the Madrid Protocol (see Dingwall article, p. 22, in this issue). The requirement that all activities must be subject to Environmental Impact Assessment (EIA) before being undertaken has brought with it a change of attitude among all the nations operating on the continent. The acceptance of good waste management, such as recycling schemes and oil-spill contingency planning, in the conduct of all operations is a very positive leap forward.

Monitoring of Impacts

Along with this emphasis on good stewardship comes the need to monitor impacts to ensure that predictions of their

to ensure that the measurements made are critical, scientifically defensible, and useful both for understanding ecosystem processes and for modifying human activities (Walton and Shears 1994).

Deciding what to monitor as measures of local impacts is at present the subject of considerable discussion and research. The continent is a biological desert. There is less than 1% ice-free ground, and it is on this that essentially all the terrestrial flora and fauna occur. However, the diversity is low in both the plants (only two flowering plants and around 300 species of lichens and mosses) and animals (about 120 species of invertebrates with the largest being only a few millimeters long). All the birds are seabirds, coming ashore only to breed and molt, as do the seals. In the sea there is much greater diversity but all the species grow very slowly because of the low water temperature.

One of the most effective forms of monitoring outside Antarctica is to measure the success of a key species known to be sensitive to specific stress or disturbance. However, our knowledge of the biology of many Antarctic species is too limited at present to be able to choose any key species with a degree of certainty. A focus of research at present is establishing whether particular species of fish or mollusks can be key indicators. A second monitoring method is to look for changes in community structure or the abundance of several species. Here again the slow growth and reproduction of many Antarctic species makes this difficult, although long-term measurements can provide important indicators.

Choosing What to Monitor

What are the most important local impacts that human activities can produce? We can consider three categories: direct disturbance and damage, chemical pollution by local activities or accidents, and introduction of alien species.

Disturbance

Penguins are abundant in many areas of the Antarctic and are known to react to disturbance by humans. Various investigations have been undertaken recently to see if this can be quantified either physiologically (Culik, et al. 1990; Nimon, et

The Antarctic is the world's last great wilderness and, with the judicious use of monitoring, not only can we keep it that way but we can use it as a control area for assessing damage to the rest of the Earth.

Local Impacts

Most publicity and public concern have focused on the localized impacts caused by scientific research and its logistical support operations. Impacts are largely

effects are accurate. In undertaking this more applied monitoring, a partnership is being developed between the Antarctic science community and the national operators of Antarctic research programs

al. 1995) or in terms of breeding success (Fraser and Patterson 1997). The study of Culik used implanted electrodes to measure heart rate and showed that attacks of other penguins and the presence of people and helicopters indicated increased stress. However, there was some evidence that birds could become habituated to the presence of humans. The study by Nimon used heartbeat measured by an artificial egg. These measures indicated increased stress when people approached the brooding bird, eventually resulting in desertion of the nest. Additionally, their data indicated that attacks by other penguins also produced elevated heart rates as the penguin defended its nest. Both studies concluded that these stresses might impair the ability of the parents to raise viable chicks, especially if the disturbance occurs frequently.

Other researchers have tested the hypothesis that rookeries visited frequently by tourists are likely to show lower breeding success than those not visited at all. Fraser and Patterson (1997) measured the size of two such rookeries of Adelie penguins at Anvers Island on the west side of the Antarctic Peninsula over a period of 13 years. Their data show that it was the nonvisited control site rather than the tourist site that suffered major decline in breeding success. This suggests there may be wider environmental changes significantly affecting the life cycle of these penguins.

Pollution

Pollution of the environment can be attributed to poor waste management, carelessness, or accidents. Small fuel spills have occurred at many stations over the years but more rigorous controls and careful monitoring now provide a great deal more protection against this occurrence. Sometimes an accident occurs and provides a ready-made test of how the ecosystem responds to large-scale pollution. Such an accident was the sinking of the Argentine supply ship *Bahia Paraiso* at Anvers Island in 1989. The ship spilled an estimated 600,000 liters of diesel fuel, causing slicks that dispersed over 100 square kilometers of sea surface among the surrounding islands and bays (Kennicutt 1990). An international monitoring effort was undertaken over several years to assess the

effects of this and came to some surprising conclusions (Penhale, et al. 1997). First, after a period of only two months there was no evidence in the subtidal benthic communities that the spill had ever happened, with only minor traces of hydrocarbons in the sediments (Hyland, et al. 1994). Second, there was evidence for rapid uptake into limpets, with up to 50% mortality in some areas. This probably caused a secondary effect of immediate food shortage for Dominican gulls, but surprisingly the population has continued to decline rather than showing long-term recovery as might be expected. Similarly, Cormorants lost 100% of their chicks that year and active nests have since shown an 85% decline. Other birds suffered from the direct effects of the oil, with Adelie penguins losing 13% of their numbers immediately, but no further decline in later years. Giant petrels were not directly affected by oil on the water, or uptake via the food chain. However, the high level of helicopter activity around the wreck and the continuing disturbance by attempts to recover other materials frightened the birds away from their breeding grounds.

Introduced Species

In the species-poor Antarctic environment the introduction of alien species could cause important changes in community structure if the introduced species survived. A considerable concern is at the microbiological level. What happens to the fecal bacteria flushed out into the Southern Ocean in the sewage outfalls of the scientific stations? Studies by McFeters, et al. (1993) suggested low water temperature might aid long-term viability, especially if the bacteria were incorporated into sediments. However, recent experiments by Statham and McMeekin (1994) have shown that fecal *E. coli*, *Salmonella*, and *Streptococcus* are always inactivated by solar radiation, so the problem may only exist when bacteria are discharged under the protection of an ice cover. More recently there have been reports of viruses in penguins (Gardner, et al. 1997). As yet we have insufficient data to decide if there is a problem. Keeping Antarctic animals free of introduced disease, however, may prove to be increasingly difficult.

Conclusions

Under the Madrid Protocol we have an excellent set of rules for sensible management of the Antarctic environment. Environmental monitoring in Antarctica plays an important part in ensuring that local impacts are minimized, regional impacts are identified and traced to the source, and for enabling global pollution baselines to be identified and maintained. In addition the long-term measurements of atmospheric composition can give us clear warnings of the patterns of future climatic change. The Antarctic is the world's last great wilderness and, with the judicious use of monitoring, not only can we keep it that way but we can use it as a control area for assessing damage to the rest of the Earth. IJW

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Scientific drilling of ice cores. Photo by Antarctica NZ.

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CONCEPTS OF WILDERNESS IN THE ANTARCTIC

BY ROSAMUNDE CODLING

ANTARCTICA IS OFTEN REFERRED TO AS A WILDERNESS. But what does this term actually mean in the Antarctic context, and how does it relate to the use of the term elsewhere?

Some of the countries that have signed the 1991 Protocol on Environmental Protection to the Antarctic Treaty have no areas that could be accurately described as “wilderness.” Thus, transferral of ideas directly to the Antarctic community, without taking into consideration both national differences and the geographical uniqueness of the Antarctic, can cause confusion. An attempt is made to clarify the issue by looking at comments of some of the early Antarctic explorers, before examining what the Antarctic Treaty System (ATS) has said about wilderness. These interpretations are then examined in the context of wider wilderness thinking, and possible directions for future conservation planning are developed.

The Views of Early Explorers

In their writings, early Antarctic explorers, especially in the “heroic age” at the beginning of this century, give a fascinating account of the physical environment and of their personal responses to the polar landscape. In 1903 famous British Antarctic explorer Robert Falcon Scott wrote that the interior of Victoria Land “must be considered the most desolate region in the world. There is none other that is at once so barren, so deserted, so piercingly cold, so windswept, or so fearsomely monotonous.” (Scott 1929: 607).

Yet, Scott also wrote of the continent in more favorable terms. Even when sledging on the arduous three-month Southern Journey in 1902, he recorded the beauty of snow crystals falling on a calm night:

As one plods along towards the midnight sun, one’s eyes naturally fall on the plain ahead, and one realizes that the simile of a gem-strewn carpet could never be more aptly employed than in describing the radiant path of the sun on the snowy surface. It sparkles with a myriad points of brilliant light, comprehensive of every color the rainbow can show, and is so realistic and near that it often seems one has but to stoop to pick up some glistening jewel. (Scott 1929: 441).

For those exploring the coast, such as the French naval captain Charcot in 1910, the ever-present ice brought both danger and beauty:

The mighty sea and the monstrous icebergs are playing their giant’s games under the grey and lowering sky, caressing or fighting, and in the midst of these marvelous manifestations of nature, which are not made for man, we feel that we are merely tolerated, although a kind of intimacy may be created between us and our magnificent hosts (Charcot 1978: 289).

While many of the early visitors to the Antarctic graphically described their surroundings in great detail, they rarely used the word “wilderness.” This term has appeared regularly only during the last 30 years or so, and is now frequently used in descriptions of the continent, especially in environmental and popular writings.

The Antarctic Treaty System

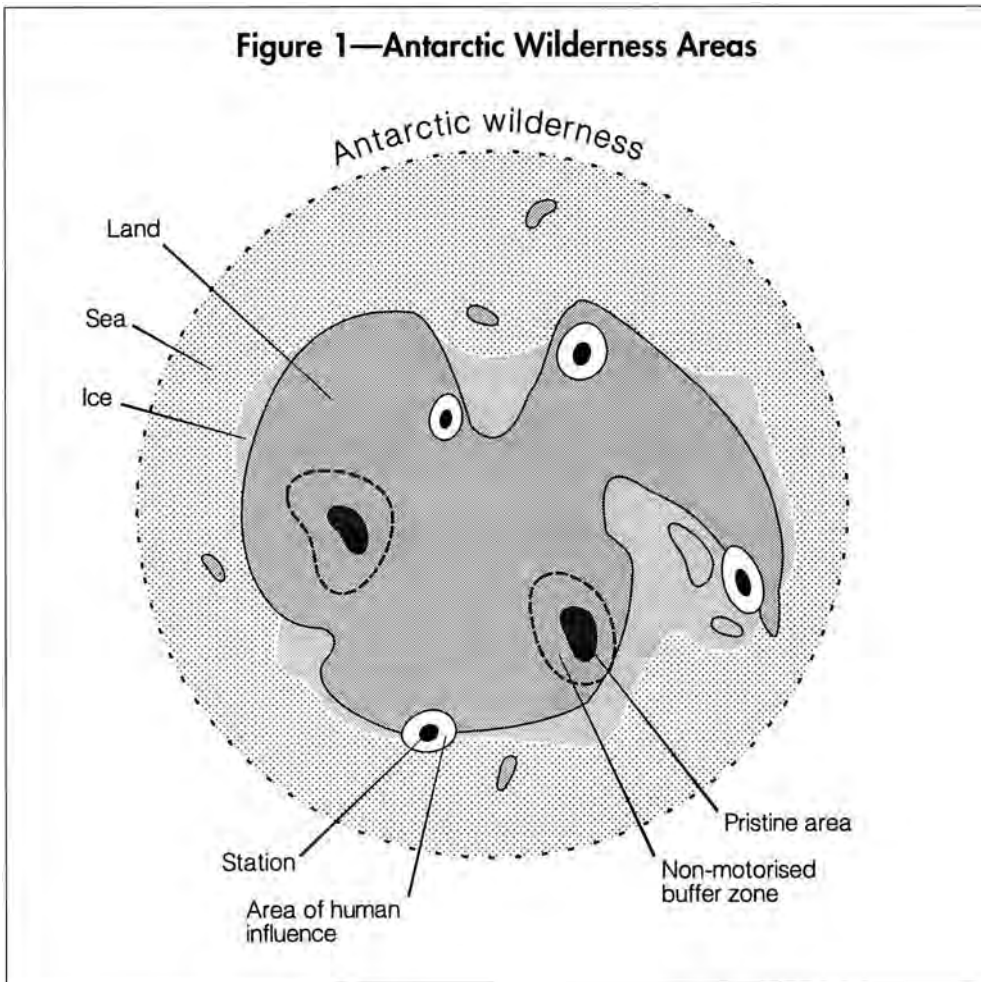
In the more than 35 years since the Antarctic Treaty entered into force, a vast collection of documents has amassed including those from the Treaty’s Scientific Committee on Antarctic Research (SCAR). From these we can find that the concept of wilderness in the Antarctic has only gradually emerged.

Initially, the treaty nations focused on the development of scientific research. As other activities such as tourism began to develop (Reich 1980) concerns widened. In 1980 SCAR produced “A Visitors Introduction to the Antarctic and Its Environment,” a 28-page booklet that included recognition of “a general awareness of the value of unspoilt nature or wilderness. The last



The icy grandeur of Mt. Erebus, the active volcano on Ross Island, Antarctica. Photo by *Antarctica NZ*.

Figure 1—Antarctic Wilderness Areas



remaining extensive wilderness is the Antarctic.” (SCAR 1980: 26). Reference was also made to the uniqueness of the continent’s scenery and wildlife, but the statements were very general.

Shortly after, SCAR and the International Union for the Conservation of Nature and Natural Resources (IUCN) jointly produced *Conservation in the Antarctic* (IUCN/SCAR 1986), a report that recognized the need to explore protected area concepts such as wilderness or park designation, but the subject generally was still being treated in a broad-brush manner. One of the most expansive ATS comments concerning wilderness came from the SCAR document *Objectives of Conservation in the Antarctic*. It was considered necessary “to minimize disturbance by human activity so that ... unique features, localities or complexes of features and sites of scientific importance are undisturbed ... cultural values, such as scenic beauty, inspirational quality, wilderness status and recreational poten-

tial can be maintained.” (1989: 182). However, no attempt was made to define methodology to assess such values, or suggest appropriate management plans to protect them.

These generalizations continued in the late 1980s, including a Recommendation from the XV Antarctic Treaty Consultative Meeting in Paris in October 1989 calling for comprehensive measures for the protection of the Antarctic environment and dependent and associated ecosystems. In turn, this led to development of the Protocol on Environmental Protection to the Antarctic Treaty, which was adopted in 1991.

At the heart of the Protocol is Article 3, which covers a range of principles applying to all Antarctic activities. The opening section of the Article refers to the intention to protect “the Antarctic environment ... and the intrinsic value of Antarctica, including its wilderness and aesthetic values.” Similar phraseology occurs three more times in the Protocol or its Annexes,

but no closer definition is offered for these terms (Article 3, section 2 [b]vi; Annex V, Article 3.1 and Article 3.2 [g]).

These examples illustrate the pattern that has emerged from examination of the more formal Antarctic documents. While it is commendable that there has been a growing recognition of wider environmental concerns, there is as yet no firm understanding as to how they are to be considered. Moreover, although the term “wilderness value” is now well-established in the ATS, there have been no attempts to define what it means, or to identify specific wilderness areas or develop comprehensive management safeguards.

Explaining the Concept of Wilderness

Three writers have endeavored to expound on the concept of polar wilderness. Mosley (1986) defined the “value of the Antarctic wilderness” as maintenance of natural benefits, political cooperation, and long-term environmental stability, although he did not identify potential conflicts, such as permanent structures and the issue of motorized transport.

Roots took an approach that was historically wider, giving an analysis that separated the European fascination with polar wilderness from the indigenous view. He suggested that northern peoples had been able to prosper within the Arctic environment because they had become part of the ecosystem. He concluded:

What do polar wildernesses contribute? They have provided essential elements of history, culture, knowledge, psyche, and spirit, for better or for worse, for at least the past 2300 years. Today, particularly, they are important to our self-awareness, our environment, and to what actions we can take towards a sustainable future. To whom do they contribute? To each of us, no matter where we live (1995: 127).

The most analytical examination came from Watts:

Any human activity in Antarctica will have some environmental impact, and the only form of

complete protection for the Antarctic environment would be one which excluded human activity there altogether (and even then, the environment would remain susceptible to influences from outside Antarctica). The questions to be faced in practice are whether the value of the activity to be undertaken outweighs the environmental impact which will inevitably accompany it, and whether those impacts can be minimized without undermining the value of the activity giving rise to it. In short, a balance has to be struck (1992: 253).

The Dilemma of Human Development

Wilderness areas are usually thought of as having minimal incursion from human development and associated technologies and structures. How can this generally accepted requirement for wilderness be married with the needs of survival of any human being in the region? It may be difficult for those who have not experienced the southern environment to realize that safety is fundamental to the discussion. Inadequate clothing or equipment, which might cause temporary discomfort in another wilderness area, may lead to serious injury or death in the Antarctic. The hostility of the environment cannot be ignored, which raises the question of accommodation. So far, most nonscientific visitors come in the austral summer, with the greatest numbers as cruise-based tourists. Other recreational visitors, such as mountaineers, are able to use tents for relatively long periods. Fieldwork parties may also use such accommodation. But without the backup of more substantial station buildings, the variety and quality of scientific studies would be seriously affected.

As far as Antarctic transport is concerned, there has been no truly feasible and environmentally acceptable alternative to the internal combustion engine. Huskies, beloved by many were removed from the continent in 1994, and although some visitors, such as the mountaineer Messner, have occasionally been able to use parachute sails to assist them when skiing, the scope of scientific work, for

example, would be considerably limited by the absence of airplanes and vehicles. Tourists visiting by ship carry their accommodation and their means of propulsion with them, but while they may be spectators to the wilderness that is the land, they live and move through the wilderness that is the sea. The adventurers, whether mountaineers or skiers, also come either by ship or airplane. They may not depend on further transport if their plans go well, but all responsible expeditions have to have emergency backup plans. The conclusion is simple. If any form of human activity is to continue on the continent, there will be buildings, ships, airplanes, and motorized vehicles.

Wilderness in Antarctic Conservation Planning

For conservation planning purposes, a working approach to the concept of wilderness in the Antarctic could consider the following two propositions: (1) begin by the acceptance of the Antarctic, including its surrounding seas and islands, as a wilderness, and (2) declassify from this area only those parts that do not conform to generally accepted definitions of wilderness, such as scientific stations and transport corridors.

Scientific Stations

The methodology used by the Australian National Wilderness Inventory

Tourists visiting by ship carry their accommodation and their means of propulsion with them, but while they may be spectators to the wilderness that is the land, they live and move through the wilderness that is the sea.



Tourists aboard an inflatable craft look small compared with the scale of the Antarctic landscape surrounding them. Photo courtesy of the Department of Conservation, New Zealand.



Scientific stations, such as New Zealand's Scott Base, are highly visible as human intrusions into the otherwise stark Antarctic landscape. Photo by *Antarctica NZ*.

(Lesslie, et al. 1993) offers some help in this regard. In this system, four indicators are applied: remoteness from settlement, remoteness from access, apparent naturalness, and biophysical naturalness. The first two indicators dealing with remoteness merge in the Antarctic, as roads and tracks on the continent are limited to settlements (taken to include

refuges, masts, and so forth, plus an "assessment of visibility" from the surrounding land and sea. As shown diagrammatically in Figure 1, an "Area of human influence" could be represented by the outer of two circles, although in practice the actual area would be influenced by local topography. In the case of Rothera, a British coastal station,

Wilderness needs to be seen in a global context, as part of a continuum of human impact that begins with highly urban areas and ends with remaining pristine regions.

both existing and former stations) and their immediate surroundings. Any modifications resulting from the third indicator, apparent naturalness, will also be predominantly linked to stations, although there may also be isolated areas elsewhere, which have been modified by human action. Thus, three of the four indicators coalesce into a single indicator suggesting evidence of the presence of people.

On the ground, this would correspond to the total station area, including all outlying structures, such as

the whole Rothera Point would be included, with a somewhat arbitrary outer line at the 5-kilometer radius, suggesting an "assessment of visibility."

The final indicator in the Australian system is biophysical naturalness. Ecologists may identify areas on the continent, over and above the defined "areas of human influence," which show degradation of "biophysical naturalness." If such areas are present, grading of their condition could modify wilderness values, suggesting greater or lesser quality. However, it seems more likely that a straight-

forward designation of "Antarctic wilderness" could be made in all areas where there is no indication of human presence.

Transport Corridors

With present technology, there seems to be no adequate alternative to the use of motorized transport in the Antarctic for scientific work and the support of recreation and tourism. Yet there is continued pressure for enjoyment by "simple, quiet, non-polluting and non-intrusive means of travel"—the description offered by the International Union for the Conservation of Nature (IUCN 1994: 18). Given this preference, perhaps the following proposal might be debated. Some have called for the establishment of inviolate or pristine control areas for scientific comparison with localities that have been disturbed by humans (Lewis Smith 1994; Protocol 1991, Annex V, Article 3.2[a]). Taken to the logical conclusion, motorized transport and overflying would also be prohibited in these areas, so as to avoid contamination. These locations, with a surrounding buffer zone would lie within the greater "Antarctic wilderness." Perhaps motor-free recreation could be permitted within the buffer zone.

Conclusion

Wilderness needs to be seen in a global context, as part of a continuum of human impact that begins with highly urban areas and ends with remaining pristine regions. If this hierarchy of "paved to pristine" is recognized, then each element should be valued for the part it can play in the life and work of people. In the case of the Antarctic, there may be the temptation to assume that the areas of human influence are of little or no consequence. However, some of the problems associated with cumulative impacts have already been identified (see p. 27 of Dalziell and De Poorter article in this issue). The wise use of all areas to the highest environmental standards is essential, even if they appear to be "only an odd hectare or two" in the middle of a continent 14 million km² in size. A possible planning approach to assist in meeting these ends is suggested above, the implications of which go beyond the 1991 Madrid Protocol. **IJW**

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LETTERS TO THE EDITOR

Dear Editor,

In his letter to the *IJW* (vol. 2, no. 3), Reed Noss laments the difficulty of enlisting wilderness recreationists in support of his vision of what should be done for biodiversity. The difficulty is real. But it may be less because of the obduracy of these recreationists and as much because his focus is misplaced.

A crusade for biodiversity ought to be focused on the lands where biodiversity (i.e., richness of species and genetic variation) is found, which is not high elevation wilderness in the American West. Rather it should be focused on seminatural lower elevation lands, with particular emphasis on the Southeast.

It is true that remnant populations of hard-pressed large mammals and predators inhabit these wilderness areas, but their viability depends on ranges that extend well beyond classified wilderness. Their survival is keyed to appropriate management regimes for their entire ranges, not to changing the management of wilderness areas. Nor is it likely that these protected areas can be expanded to include their entire ranges.

Noss's desire to appropriate federal wilderness areas into his intellectual framework is like trying to draft ants into an army. They are the wrong conscripts. They have little to offer, and little is gained by turning their management on its head.

Wilderness areas are designed to be areas that are not manipulated to produce any given vegetative look (viz: "hands off" policy). His desire to manipulate them is misplaced. Manipulating them will do little to advance the cause of biodiversity (both because the ranges are large and the biodiversity is largely elsewhere).

Let's work together to design a new formula and manage vegetation to protect biodiversity where it is found and leave traditional western wilderness alone.

Michael McCloskey
Chairman, Sierra Club

Dear Editor,

I would like to correct a few comments made in the June 1997 issue of *IJW* regarding the Hells Canyon Rim Road bill (HR 799).

In the page 3 editorial you speak of building a road through the wilderness. Actually, no road building is contemplated. The road in question has been present for over 40 years and was intended by Congress to be left out of the Hells Canyon Wilderness when it was created in 1975. But through a mapping error the wilderness boundary crosses over the Rim Road by a few feet in several spots. HR 799 would correct this error.

On page 39 of your June issue, there is mention of Wes Cooley who is no longer a member of Congress. The bill is being sponsored by Representative Bob Smith in the House and Gordon Smith in the Senate. The primitive one-lane Rim Road, which runs parallel to the Hells Canyon Wilderness, will provide greater hiker access and better photographic opportunities but will not affect game migration in the wilderness itself. The U.S. Forest Service will continue to manage the road and, of course, can close it if there is any adverse impact on any game species.

Thank you,

George M. Burns, M.D.
Co-chairman, Committee to Reopen Rim Road (CORRR)

BOOK REVIEWS

JAMES R. FAZIO, BOOK REVIEW EDITOR

Deep Ecology in the High Arctic. International Ecophilosophical Symposium, Svalbard, August 29–September 2, 1994. Available from Norwegian Polar Institute, P.O. Box 505, N-9170, Longyearbyen, Norway.*

A challenging feature of the High Arctic environment is the persistence of fog. Whether crossing the tundra, climbing peaks, or negotiating the seas, clouds of fog can appear out of nowhere. Travel becomes tedious and difficult, obscuring the goal. Reading *Deep Ecology in the High Arctic* reminds me of the fog drifting in and out of the harsh, yet incredibly beautiful landscape: There are some valuable insights and salient reflections in this publication, but as a collected work I wonder about its intent and scope.

In all fairness, this is not a comprehensive book on the subject, but a collection of papers from a small symposium held in Longyearbyen in the High Arctic archipelago of Svalbard in 1994. The event drew speakers from Norway as well as from other continents and highly different environments, all presumably with some interest in deep ecology. The volume covers a wide and disparate range of contributions, including a treatise on deep ecology arguments by Norwegian philosopher Arne Naess, perspectives on environmental philosophy, descriptions of traditional Sami terminology, discussions on how to change human behavior, experiences with environmental protection in polar regions, as well as the obligation of scholars to engage in controversial issues—all of which are relevant concerns in the Arctic as well as in ecophilosophical thinking.

As befits new and alternative ways of thinking, deep ecology is both contested and acclaimed. It is welcome and timely that deep ecology also addresses its issues to the Arctic. The attempt, however, is problematic both in terms of intellectual and pragmatic aspects. In other words, what is there to be learned about deep ecology here, and how does it apply to the High Arctic? Deep ecology is a young field of inquiry, and the current literature offers little consensus on concepts, theory, or implications. Having read a good deal of the existing literature on deep ecology, I must admit that this publication did not add much clarity to the conceptual aspects of the subject. The authors, who mostly draw on their experiences from settings

outside the Arctic, generally fail to make an argument within the context of deep ecology. Throughout the reading I wondered: What are some of the deep ecology implications of their arguments, and what could it mean within the context of the Arctic? Few, if any, of the authors attempt to answer this.

Perhaps I view this too narrowly. Yet, deep ecology is a philosophy urging us to be more concerned about our future through asking fundamental questions about our relationship with the land. In a very general and decontextualized way in terms of the High Arctic, some of the authors attend to this. But deep ecology is also a kind of framework with some basic principles, it's not just any type of broad environmental philosophy. The High Arctic represents a unique environment with a lot of peculiarities as regards resources, history, and its populations. A discussion of deep ecological perspectives on the dynamics of the current management regimes, and the various settlement acts with indigenous peoples around the Circumpolar region, would have been very enlightening. So would some reflections on the very real and imminent problems of the region, such as waste dumping in the oceans, military activities, mining, oil and gas exploration, increasing tourism, and the increasing dependency of local economies on international economies, as well as other sociocultural problems that abound in these northern communities. In my mind these are some of the issues that really need attention by people who are equipped to make good deep ecological arguments.

Despite the lack of grounding between the philosophy and the unique context of the Arctic, there are some interesting reflections in several of the papers. You may not learn a whole lot about deep ecology or the Arctic, but the report is nevertheless a contribution to the debate on how to sustain the marginal environments of the globe.

*Reviewed by Bjorn P. Kaltenborn, senior research scientist, Eastern Norway Research Institute.

The Boundary Waters Wilderness Ecosystem by Miron Heinselman. 1966. University of Minnesota Press, Minneapolis, Minnesota. 334 pp., \$24.95 (hardcover).*

Childhood experiences often lead to a productive lifetime career. This was true for Miron (Bud) Heinselman who as a boy experienced the wonder of the Boundary Waters and after an outstanding scientific career returned to serve as an advocate for preservation of this wilderness. This book is his effort to provide the reader with a sense of the “fascinating diversity complexity, and beauty of the natural systems of the Boundary Waters ...” and to bring together a complete and accurate picture of the area for potential educational, scientific, management, and cultural use. Well designed and illustrated, this is no “coffee-table” volume, but is instead a substantial scholarly book that in its 16 chapters considers every aspect of the Boundary Water Wilderness (BWW), its physical environment, history, biota, fire ecology, and dynamics. The BWW is the primary focus, but Heinselman often calls attention to conditions in the two neighboring wilderness areas, the Canadian Quetico and Voyageurs National Park.

The book's chapters are arranged in logical order. A brief introduction is followed by consideration of climate and climatic extremes, such as drought and the relationship of drought to fire years. A third chapter outlines the geologic history and physiography, the extent and gradual departure of the Ice Age, and the origins of soils, lakes, and wetlands. The fourth chapter discusses the BWW plant communities, both trees and understory vegetation, and considers these communities in the context of disturbance in the northern forest. A fifth chapter relates the changes in the postglacial forests as species gradually returned from their glacial refuges and colonized the exposed land. Climatic shifts during postglacial time are noted, and the author also gives us a glimpse of early human inhabitants that reached our continent across the Bering Strait. The impact of the fur trade on Native Americans and on the Boundary Waters biota completes the early history.

The intriguing and complex story of wildfire is illustrated in chapter six where Heinselman describes his methods for

establishing fire histories in the virgin forests. Heinselman's description of the process illustrates his careful attention to detail and his determination to understand, in scientific terms, the relationship of fire to the mosaic pattern in the forests. The work resulted in maps of fire extent, estimates of fire intensity, recognition of natural fire regimes, and solid conclusions regarding the role of fire in forest development. The next chapter describes ecosystem properties, for example, nutrient cycling, biomass storage, reproductive strategies, and forest structure, as these properties influence or are influenced by fire.

The two major logging periods, Big Pine Logging (1895–1930) and the Pulpwood Era (1935–1978) are discussed in separate chapters. The logging companies involved, the areas in which they logged, and the fires associated with that logging are documented as are the relationships between fire and reproduction. Logging in the Big Pine period often led to development of modern red and white pine stands. Logs were moved by horse to water and floated to nearby mills. In some instances short rail hauls were included. Slash fires were common and many areas lost seed trees and shifted to aspen and birch. Heinselman stated that, “Within the logged regions in these early pine operations, fully half of the total land surface may be occupied by vegetation that was not changed substantially by the logging.”

During the Pulpwood Era, use of motorized equipment grew rapidly. Major sales and logging operations are documented as are their impact on the BWW. In 1945 a large area was sold, beginning development of a major road network with greater use of motor driven equipment and trucks for hauling. This and later large sales led to major changes in forest composition. Here Heinselman outlines events leading to the Burton-Vento Bill and the amendment to The Wilderness Act (TWA), that finally prohibited logging in wilderness areas. He emphasizes the importance of the mosaic of patches of stands of different species

and ages that resulted from natural fires before 1910, pointing out that the mosaic resulting from these earlier fires depended on many factors, such as patch shape and size, conditions at the time of burn, stand age, and fire intensity. The age-class mosaic may shift, and the fire regime may change with fluctuations in climate and may also change with continued effective fire control.

After establishing the critical importance of natural fire, Heinselman devotes a chapter to his recommendations for fire management programs essential to restore the forest mosaic that has developed since 1910 under fire control, a period that has seen a great increase in aging stands. The Superior National Forest has been effective in fire control but often at high cost. Heinselman states that the present policy may eventually result in much larger fires and notes the potential consequences of inaction. The mammals, birds, and human visitors likewise are important components of the BWW ecosystem and are influenced by and also influence the functioning of the system. In the chapter on mammals, major species and their complex interactions (e.g., the moose, deer, caribou, beaver, and wolf grouping), are examined based on studies by early and modern researchers and on the authors personal observations. Every mammal known in the region, from black bear to least shrew, receives attention.

Similarly the birds of the BWW (and the Quetico) are listed, from the year-round residents (18 species), the winter visitors that breed elsewhere (10 species), and the migrants en route to other breeding locations (50 species), to the warm-season residents that come to breed (110 species). Much of the information on birds Heinselman attributes to other sources. However, his own observations are included, especially on the influence of fire, insect infestation, blowdown, and other disturbances that result in changes in habitat, behavior, and bird numbers.

Lakes and streams are integral parts of the BWW, the Quetico, and Voyageurs. Lake shape, water quality, and other characteristics are determined largely by the

nature of the bedrock and the surrounding vegetation. The lakes are affected by fire in various ways. Much of this chapter discusses fish in relation to lake types. Building on research in the Quetico, four species are emphasized: northern pike, walleye, lake trout, and small mouth bass. These are major predators that impact the entire aquatic system and are also a major attraction for visitors. (Tables are included that indicate lake characteristics and lakes favorable for certain fish species.) This chapter also includes a clear factual discussion of acid rain and mercury deposition and the potential each has to alter the aquatic system. Characteristically, Heinselman approaches both problems with solid facts rather than scare tactics and so provides reasoned conclusions that support is needed for corrective action.

Visitors may also produce change in the ecosystem. Heinselman begins with quotes from TWA of 1964 and the Boundary Waters Canoe Area Wilderness Act of 1995 to establish the purposes for which the BWW was established. He demonstrates growth in use for both the

BWW and the Quetico and documents changes in regulations relative to motors, length of stay, and size of party. A visitor distribution system is now operating in both the Quetico and the BWW and research on campsite selection and maintenance has helped to reduce site expansion, erosion, and other problems, including water quality. The problem of too many people remains. Managers of parks and similar public properties other than wilderness will likely find some useful techniques.

In his last chapter, "Tomorrows Wilderness," Heinselman speculates on the fate of the BWW and the entire northern forest in the event of global climate change. He outlines the impacts on vegetation, birds, mammals, streams, lakes, and fish. He is convinced that global warming has begun and that major effects will be felt soon unless drastic measures are taken worldwide. He suggests that planning start now to avoid the possible loss of major forest communities and to avoid ignition of catastrophic fires. To reduce these threats he advocates increased use of fire to reduce excessive fuel accumulation and

to regenerate the large areas of aging stands of jack pine and spruce, and fir, aspen, and birch forests. Despite changes that he believes are almost inevitable, Heinselman remains optimistic that if his suggestions are implemented many characteristics of the wilderness can be maintained and that its scientific, educational, and inspirational values may be preserved. In a short epilogue the author states his personal feelings and his path toward understanding the nature and meaning of wilderness. Perhaps one day the essence of that knowledge will be shared by every thinking person. This is a unique book that delivers a mix of sound science, solid practical advice, and inspiration. Its pages beckon to all whether they be fishing enthusiasts, hunters, historians, teachers, students, philosophers, politicians, woodworkers, or urbanites. This book should be a life-long companion for everyone who feels the pull of wilderness and the challenge of the northern forest. **IJW**

***Reviewed by Forest Stearns, professor emeritus, University of Wisconsin, Milwaukee, USA.**

Due to a problem in the production process after the completion of editing, several errors and omissions occurred in the Book Review section of the March 1997 issue of *IJW* Specifically:

1. The reviewer of *Wilderness Therapy: Foundations, Theory, and Research* was omitted. She is Rocklynn Culp, graduate student in the University of Idaho's Department of Resource Recreation and Tourism.
2. In the review of *Thelon—A River Sanctuary* reviewed by James R. Fazio, most paragraph indentations were omitted, resulting in run-on type.
3. In the review of *Northern Wilderness Areas: Ecology, Sustainability, Values* reviewed by Bjorn Kaltenborn, the editor of the book's name was misspelled. It is Anna-Liisa Sippola.

We regret these errors and have taken steps to prevent their reoccurrence.

—Alan Ewert, Acting Managing Editor

ANNOUNCEMENTS AND WILDERNESS CALENDAR

- **Artists, Scientists, and Conservationists Cooperate to Save the Stoltmann**
- **“Wilderness Lovers Say the Darndest Things”**
- **Publications and Proceedings Available**
- **Upcoming Conferences**
- **South African Digest**

Artists, Scientists, and Conservationists Cooperate to Save the Stoltmann

When in 1993, the British Columbia (B.C.) government decided to protect only one-third of Clayoquot Sound on the wild west coast of Vancouver Island, it spurred massive global protest, including the largest act of civil disobedience (logging road blockades leading to the arrests of over 900 citizens) in Canadian history. Unless Glenn Clark's 1996 decision to protect only 20% of Canada's Stoltmann Wilderness is countered by a similar public outcry, this precious B.C. rainforest will be lost.

Already thousands of people have signed a Western Canada Wilderness Committee (WCWC) petition demanding the protection of the entire 260,000-hectare Stoltmann Wilderness. Several hundred WCWC volunteers have carved a 30 km. hiking route deep into the rainforest of the Elaho, the largest of the Stoltmann valleys. Suspension foot-bridges now span rushing canyon creeks, giving the forest path the feel of an exotic Amazon rainforest.

With the help of donations from Stoltmann Wilderness supporters, WCWC will build canopy research platforms in a grove of towering Douglas fir trees, similar to those it built in 1991 in the Sitka spruce trees in the Carmanah Valley. They will allow scientists to explore the tree-top world and find new “old-growth dependent” species. In Carmanah, the upper canopy research led to the discovery of hundreds of insect species never before known to science.

WCWC aims to show the world that the Stoltmann Wilderness is a global natural treasure and to convince the B.C. government that it must be preserved.

For more information contact WCWC, 20 Water Street, Vancouver, B.C. V6B 1A4, Canada. Telephone: (604) 683-8220; e-mail: wc2wild@web.apc.org; web page: <http://www.web.apc.org/wcwild/welcome.html>. (Excerpted from WCWC *Educational Report*, vol. 16, no. 1.)

“Wilderness Lovers Say the Darndest Things”

These are actual comments left last year on U.S. Forest Service registration sheets and comment cards by backpackers completing wilderness camping trips:

“A small deer came into my camp and stole my bag of pickles. Is there a way I can get reimbursed? Please call.”

“Escalators would help on steep uphill sections.”

“Instead of a permit system or regulations, the Forest Service needs to reduce worldwide population growth to limit the number of visitors to wilderness.”

“Trails need to be wider so people can walk while holding hands.”

“Ban walking sticks in wilderness. Hikers that use walking sticks are more likely to chase animals.”

“All the mile markers are missing this year.”

“Found a smoldering cigarette left by a horse.”

“Trails need to be reconstructed. Please avoid building trails that go uphill.”

“Too many bugs and leeches and spiders and spider webs. Please spray the wilderness to rid the area of these pests.”

“Please pave the trails so they can be plowed of snow in the winter.”

“Chairlifts need to be put in some places so that we can get to wonderful views without having to hike to them.”

“The coyotes made too much noise last night and kept me awake. Please eradicate these annoying animals.”

“Reflectors need to be placed on trees every 50 feet so people can hike at night with flashlights.”

“A McDonalds would be nice at the trailhead.”

“The places where trails do not exist are not well marked.”

“Too many rocks in the mountains.”

“Need more signs to keep area pristine.”

Publications and Proceedings Available

Managing Americas Enduring Wilderness Resource, the book published in conjunction with the 1989 international conference of the same name. The conference and book commemorate the 25th anniversary of the 1964 Wilderness Act and the establishment of the National Wilderness Preservation System. Containing 118 papers, the collection remains an excellent source of information for anyone interested in America's wildlands and parks (\$15.00).

Fourth International Outdoor Recreation and Tourism Trends Symposium and 1995 National Association of Recreation Resource Planners Conference. In 1995 the Fourth Outdoor Recreation and Tourism Trends Symposium and National Recreation Resource Planning Conference was held in Minneapolis-St. Paul, Minnesota, USA. More than 400 individuals from 48 states, 5 Canadian provinces, and 10 other countries participated in the event. The proceedings include 119 papers and 650 pages, in 12 subject areas. The cost of this publication is \$70.00.

Recreation Fees in the National Park Service: Issues, Policies and Guidelines for

Future Action. This publication is based on a workshop held in August 1996. Seventeen papers discuss the background and overview of the workshop, recreation fee issues in the larger context, fee policies and programs of federal and state agencies, and guidelines for policy, management, and research. It is a valuable resource for anyone interested in, or responsible for, public recreation facilities and services (\$9.00).

Congestion and Crowding in the National Park System: Guidelines for Management and Research. This publication contains current ideas and principles about congestion and crowding in parks and related settings. Six papers highlight discussions of information gaps, trends, carrying capacity, direct and indirect management techniques, and expert systems concerning congestion and crowding (\$9.00).

All four publications are available by contacting David W Lime, University of Minnesota, Cooperative Park Studies Unit, Department of Forest Resources, 115 Green Hall, 1530 North Cleveland Avenue, St. Paul, MN 55108, USA. Telephone: (612) 624-2250; e-mail: dlime@forestry.umn.edu. Make checks payable to University of Minnesota.

Upcoming Conferences

Wilderness Science in a Time of Change: May 23-27, 1999, in Missoula, Montana, USA. Since the first National Wilderness Research Conference in 1985, interest in wilderness has increased, international and societal definitions of wilderness have evolved, and wilderness science has improved. This conference will present research results and synthesize knowledge and its management implications. The conference should result in a state-of-the-art understanding of wilderness related research. It will also improve our understanding of how research can contribute to the protection of wilderness in the 21st century. Considerable attention will be devoted to the ever-changing role of wilderness in society and the need to better integrate diverse social and biophysical sciences.

For more information, contact Natural Resource Management Division, Center for Continuing Education, University of Montana, Missoula, MT 59812, USA. Telephone: (406) 243-4623 or (888)

254-2544 (toll-free); e-mail: ckelly@selwayumt.edu.

South African Digest

National Wilderness Summit Initiates Action Plan

Forty conservation professionals from a wide range of regional, national, and non-governmental organizations met May 8-10, 1997, and created a new national initiative to consolidate and strengthen the wilderness movement in South Africa. This national wilderness colloquium was held at the Geelhoutbos Field Station in the Bavianskloof Wilderness Area in the Eastern Cape to conceive ways to strengthen the role of wilderness in the health, security, and economic well-being of all South Africans. The major elements of the new National Initiative are:

- A comprehensive national inventory of wilderness and wild areas.
- Creation of a National Wilderness Council, representative of multicultural and regional interests, to resolve issues and represent wilderness to the public.
- Preparation of a Strategic Plan to enhance and strengthen the role of wilderness in the future health, security, and well-being of all South Africans.
- Formulation and promotion of new national legislation for the identification and protection of additional wilderness in South Africa.

The colloquium was sponsored by the International Wilderness Leadership (WILD) Foundation (United States), The Wilderness Foundation, Wildlands Trust, Thaba-Manzi Estates, the Department of Economic Affairs, Environment and Tourism (Eastern Cape), and the U.S. Embassy. The meeting was facilitated by three wilderness leaders from the United States: Dr. John Hendee, professor and director, University of Idaho Wilderness Research Center; Vance Martin, president, the WILD Foundation and International Center for Earth Concerns; and Marilyn Riley director, Wilderness Transitions Inc.

For further information contact Andrew Muir, executive director, Wilderness Leadership School. Telephone: 03142-8642; e-mail: wilderness@eastcoast.co.za.

Wilderness Leadership School Convenes Symposium on Rites of Passage for Youth at Risk

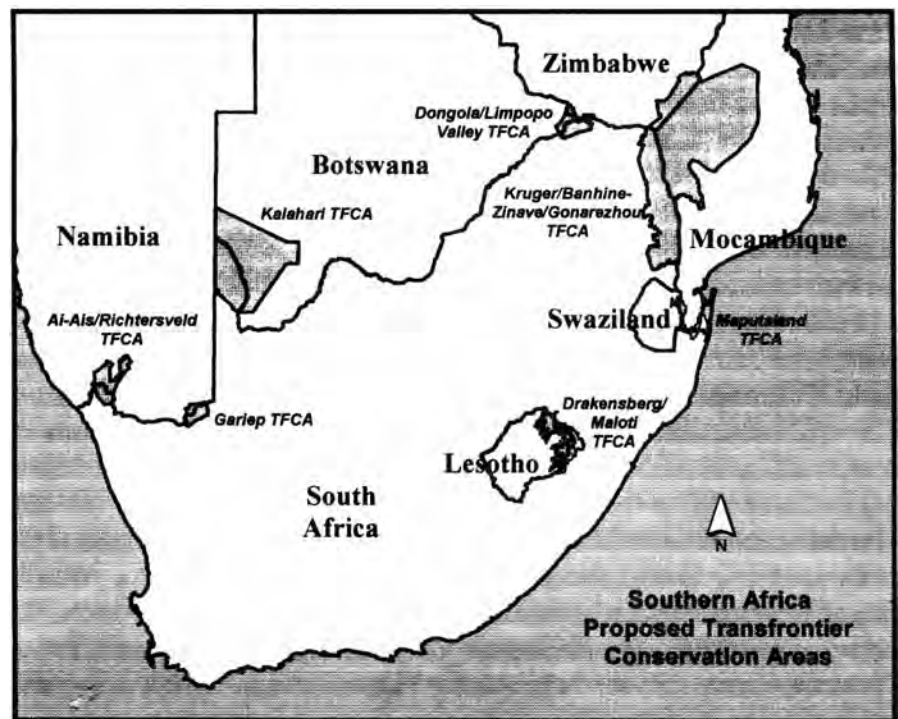
May 1, 1997—The Wilderness Leadership School convened a symposium at their headquarters in Durban on the importance of “rites of passage for at risk youth” as an approach to helping combat youth crime and gang violence in South Africa. This historic relevance of youth rites of passage in wilderness and nature was one area of emphasis. The symposium was attended by 20 invited persons representing universities, government departments of justice, private foundations, wilderness guides, and non-government organizations such as the Wilderness Leadership School and Outward Bound.

The symposium focused on a book by Don Pinnock, *Gangs, Rituals and Rites of Passage*, documenting the serious youth crime and gang violence problems in South Africa and unhealthy rites of passage evolving among some youth. A keynote of ideas was provided by Credo Mutwa, noted South African scholar, philosopher, and prophet. Other speakers were Dr. Ian Player of the Wilderness Foundation; and from the United States, John Hendee, professor and director of the University of Idaho Wilderness Research Center and Marilyn Riley director of Wilderness Transitions Inc.; Andrew Muir, executive director of the Wilderness Leadership School, will convene a follow-up meeting with a limited group to develop an action proposal.

Peace Parks Underway

A bold regional initiative is underway in Southern Africa, spearheaded by the Peace Parks Foundation, headquartered near Capetown. “Peace Parks” are transfrontier conservation areas, which bind together two or more countries in a partnership of regional cooperation, economic opportunity, and biodiversity conservation. Nature does not abide by political boundaries, and therefore the Peace Parks initiative is an important ecosystem-based approach to international nature conservation and wildland protection.

The idea of Peace Parks is not new. The pioneering effort in this concept was



in 1932, when official cooperation was established between Glacier and Waterton National Parks (United States and Canada). However, this new initiative in Southern Africa is the first such proactive initiative with a nongovernment organization completely dedicated to the mission, and with a professional staff focused on the objectives. Dr. John Hanks, formerly of WWF (International) and WWF (South Africa) is the executive director. The regional importance of this initiative is underscored by the fact that presidents Mandela (South Africa), Nujoma (Namibia), and Muluzi (Malawi), and King Letsiell (Lesotho) are the Honorary Patrons.

The Peace Parks Foundation supports and initiates projects that specifically promote Peace Parks. For example, further to a request from the Mozambican government, the Foundation injected emergency funding into the Maputo Elephant Reserve in Southern Mozambique. These funds provided basic salaries and infrastructural requirements of the reserve, pending its incorporation into the much larger Maputoland Peace Park. This Peace Park will link the Tembe Elephant Reserve in South Africa with the Maputo Elephant Reserve, re-establishing an ancient elephant migration route.

As with all effective nature conservation initiatives, the success of Peace Parks depends on facilitation with many sectors: local authorities, communities, landowners, development banks, private investors, tourism officials, conservation professionals, and others. Implementation of the complex arrangements for Peace Parks is enhanced if the message is communicated to everyone who has a stake in the environmental and economic future of southern Africa.

The Peace Parks concept has significant implications for wildlands. One of its most important objectives is the conservation en situ of biological diversity. In most cases, this requires wild nature to freely evolve and adapt, and thereby maintain a strong genetic base to support life on earth. In addition, these large areas will provide enduring sanctuary for wildlife and humans in a rapidly developing Southern Africa.

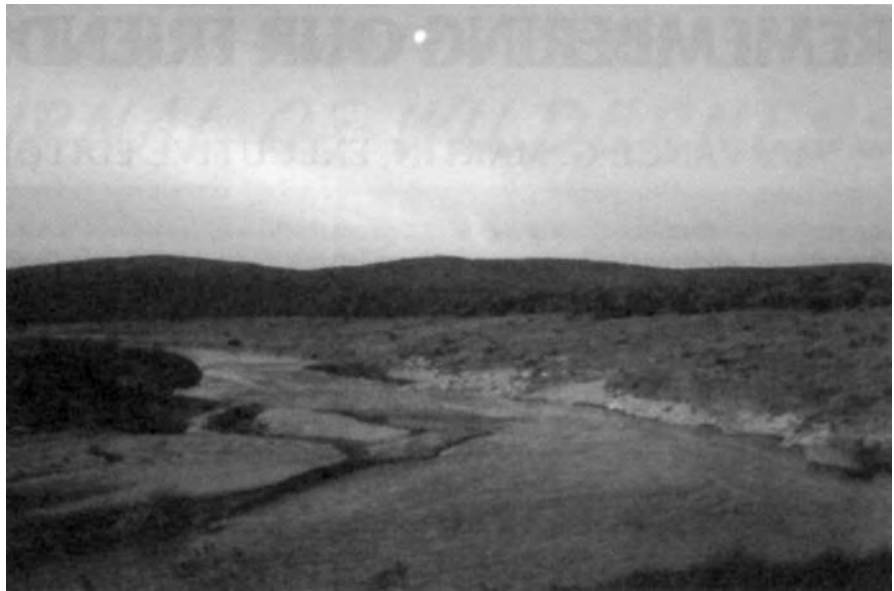
For more information about the Peace Parks Foundation, and to urge them to designate wilderness areas and integrate wilderness management plans into the Peace Parks, contact them at 29 Magnolia Street, P.O. Box 227, Somerset West, 7129 Republic of South Africa; fax: (27-21) 855-3958; e-mail: parks@ppf.-org.za.

Umfolosi Wilderness Under Threat

Wilderness conservationists in South Africa and around the world have expressed shock and dismay at a proposal by the Natal Parks Board to build a tourist camp with 100-140 beds in the middle of the Umfolosi Game Reserve, Kwazulu, Natal. The proposed Tshevu Camp would be located directly adjacent to the core wilderness zone in the reserve and violate the integrity of one of the best known wildlife and wilderness areas in South Africa.

This is no "ordinary" wilderness area. The Umfolosi wilderness is an international icon in the evolution of the wilderness concept. It was the first such area proclaimed in South Africa (1958) and has been the site of numerous conservation milestones. This is the area in which Ian Player and his team pioneered capture and translocation techniques that are now widely recognized for saving the White Rhino, established the South African Wilderness Leadership School, launched the idea of officially protected wilderness for South Africa, and conceived the World Wilderness Congress.

Currently the Environmental Impact Assessment is underway which will determine if Tshevu or an alternative location is more desirable. Because of the depth of concern expressed about this proposal, a public information meeting was scheduled at Natal Parks Board headquarters on September 22.



The moon over the Black Umfolosi River in the Umfolosi Game Reserve, Kwazulu, Natal, South Africa. Photo by Vance Martin.

The Tshevu proposal raises many concerns. Chief among them is that it contradicts the principle of peripheral development. For the sake of providing the camp visitor with a completely "natural" setting, it lowers the wildland and natural values of the entire area within the reserve. The increased lights, traffic, noise, and other elements associated with such a large camp impact a major portion of the Umfolosi, especially the core wilderness area that is immediately adjacent to Tshevu.

Wilderness managers and supporters in all countries can easily imagine a similar scenario within their own area of

work. As population pressures increase on the boundaries of parks and reserves, pressures will amount to abandon or modify the principle of peripheral development. The EIA process has begun on the Tshevu concept, and it must be full, free and unfettered.

You are encouraged to contact the Natal Parks Board directly voice your concern that the integrity of the wilderness area and its values be considered sacrosanct, and encourage them to use alternative sites on the periphery of the reserve. The Chief Executive, Natal Parks Board, P.O. Box 667, Pietermaritzburg, 3200, South Africa; fax: (27) 331-471-037.

REMEMBERING OUR FRIENDS AND HEROES

BY VANCE G. MARTIN, EXECUTIVE EDITOR (INTERNATIONAL)

For the second time in as many issues of the *International Journal of Wilderness*, I bring you news of pioneers in the international wilderness movement who have left our midst. Nick Steele (South Africa) and Wally O'Grady (Australia) were giants among us. Like emergent trees in the rainforest canopy, they were guardians over the rest of the forest. They both fought hard battles over long years to protect and sustain the green glory, the savannah stillness, and the wild song. While we are saddened by the loss of their leadership, friendship, and presence around the campfire, in their passing they continue to teach and challenge us. Their message is clear. Do not allow the gap in the canopy to remain unfilled. Be leaders, train other leaders, and, when appropriate, follow leaders. Continue the important yet commonsense work of assuring that wild nature has a place to live and prosper on this earth.



Nick Steele (1934–1997)

Nick Steele

The wilderness and nature conservation movement in South Africa lost a pioneer and leader, Nick Steele, who died in May. Nick was only 63 when he succumbed to cancer, and is survived by his wife Nola and two sons.

Well known for his love of horses, especially their early role in game capture and translocation, Nick Steele was a pioneering conservationist. He was a founding member of the Operation Rhino team, which saved the white rhino from extinction, and first director of what became the Kwazulu Department of Nature Conservation. He was one of the origi-

nators of the community conservation concept, through which local rural people could benefit from adjacent wildland reserves.

Always a force for the “new” South Africa, it was Nick Steele’s initiative in the mid-1980s that helped the first black South African candidates graduate from technical colleges with a National Diploma in Nature Conservation, and that also secured better working and career conditions for black game rangers in the conservation services.

Nick also wrote four accounts of his conservation career, the best known of which was *Game Ranger on Horseback*. Through it all—the brutal politics of apartheid South Africa, the rough and tumble of Zululand nature conservation, and the uncertainties of fighting to save wild Africa—Nick was ever a gentleman and always a champion of wild places. Go well.

Wally O'Grady

The majestic Cape York Peninsula in Northern Queensland, Australia, will remain beautiful and wild for a lot longer because of the efforts of this very unusual, unassuming, unaffected—yet very effective—man. In the early 1970s, he and a small band of followers stopped in its tracks the relentless devastation of the wood-chipping industry that was expanding into the magnificent Cape York rainforest. He and Percy Tresize explored, campaigned for, and eventually saw the designation of the Quikan

Reserve, which protected hundreds of square kilometers of aboriginal rock art. Wally, along with Verne McLaren and few others, lobbied for and eventually brought to Australia the 2nd World Wilderness Congress, of which he was named chairman.

Wally was a sugar cane farmer. In fact, he was Queensland’s youngest ever cane farmer when he took over the family farm upon the death of his father in 1926. He was just 16 and, as he told it: “I went into the bush and stood on a hill and said to myself that I would have to make a decision about how to care for this land. Not only does it belong to me, but it also belongs to all other Australians. And to the birds and the creatures as well.”

He was a cane farmer with a difference. In a radical and previously unheard of plan, he dedicated part of each of his cane farms to wild nature, “so all the creatures would have a home as well.” A life-long bachelor, he dedicated all of his personal funds to nature conservation. I’ll never forget in 1982 when Kate and I arrived at Wally’s to stay for a week, with two toddlers in tow, to find an old farmhouse with hardly any furniture or amenities and just a few bits of aboriginal art on the walls. Wally’s quiet comment later was that he just never got around to buying furniture—too much work to do on the farm and for the wilderness.

Wally was a quiet and gentle person, with a profound, even telepathic, connection to animals. In many ways, he was as much like a child as a grown man. He was also focused, hardworking, steadfastly committed to wild nature, and an advocate for human cooperation. He was always saddened by the fight—he felt that harmony was our true destiny—but he never hesitated to speak, act, and persevere. Thank you, Wally.



Wally O'Grady (1910–1997)