THE WINSTON CHURCHILL MEMORIAL TRUST
OF AUSTRALIA

Report by - **GEOFF KELLY** - 1990 Churchill Fellow

Project : **To study public education techniques applied in marine reserves to enhance the educational, recreational and inspirational value of these places to the public - UK, Ecuador, USA, Canada.**

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CONTENTS

INTRODUCTION

Increasing human population and technical ability is rapidly leading to the degradation of natural areas in all parts of the world. Parks and reserves, as a consequence, are becoming dramatically more important as refuges of biological diversity. These places serve a great many functions, from scenic backdrops and recreational playgrounds to genetic storehouses, sources of clean water and benchmarks of ecological integrity.

Our "growth economy" generates a great momentum to extract resources at a cost to other values of the natural systems that yield them. Remnant natural areas therefore assume a total value which increases in proportion to their rarity. This process, left unchecked, will lead to a realisation of the importance of reserves only after they have succumbed to unsustainable uses.

The survival and success of parks and reserves therefore, depends directly on continuous political and economic support. Public empathy (and therefore political support) for the philosophy of conservation and with the management needs of reserves, is proportional to an understanding of their importance and appreciation of their value.

Australia's Great Barrier Reef Marine Park and Queensland's marine parks and island national parks constitute the largest multiple-use marine management system in the world. Due to the enormous size of this system, it depends even more than other reserves on public cooperation for its' effectiveness, since it is essentially unenforceable.

This Churchill Fellowship provided a valuable opportunity to study and experience at first hand, techniques used in other parts of the world for the achievement of public education in the appreciation and enjoyment of parks and reserves. Advantage was taken of opportunities to also visit terrestrial reserves and natural history educational institutions since the communicative methods in use in those places are of direct relevance to this study. The techniques learned will be adapted and applied for the benefit of the Queensland marine management system.

This report is presented in three main sections: Program - where I went, Discussion - Who does what there, and Conclusions - What I learnt.

I wish to thank the Winston Churchill Memorial Trust (especially Mrs. Elvie Munday) and the Australian Institute of Parks and Recreation for their generous support, without which this study would have been impossible. Thanks are also due Jenni Le Cussan for her tireless assistance throughout the study and to all those managers and conservation practitioners of the countries visited who freely gave their time and shared their knowledge.

EXECUTIVE SUMMARY

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Project: **To study public education techniques applied in marine reserves (and other relevant places) to enhance the educational, recreational and inspirational value of these places to the public - UK, Ecuador, USA, Canada.**

Synopsis of places and people visited:

UNITED KINGDOM:
The British Museum, Countryside Commission, Nature Conservancy Council, Marine Conservation society, Field studies centres and coastal and Marine Reserves. Met with Administrators, managers, coordinators, interpreters and wardens.

USA:
National Parks Training Centre, International Affairs Headquarters, Yosemite National Park, Everglades National Park, National Marine Sanctuaries, Coastal and island National Parks, Monterey Aquarium and The Smithsonian Institution. Met with Park Service Training Specialists, Public Contact Specialists, Interpreters, Rangers, Display Designers and Park Management Staff.

ECUADOR:
Charles Darwin Research Station and Galapagos Islands National Park. Met with the Director and staff of the CDRS & the National Park Superintendent, Naturalist Guides and Rangers.

CANADA:
Vancouver Aquarium, Pacific Rim National Park and National Parks in the Rocky Mountains. Met with Display and Education Specialists at the aquarium and Superintendents, Interpreters and Rangers at the National Parks

Synopsis of major lessons learned and planned implementation in the Australian context:

- Formative evaluation of displays provides pre expenditure assessment of effectiveness. Interactive exhibits with cognitively layered information which build directly on relevant existing perceptions are most effective.

- Environmental education effort which is directed beyond park boundaries invariably receives a lower priority than park management issue related or experience enhancement related education effort. Consequently little real extension work gets done. Forward thinking managers should readjust these priorities.

- Reserves should (but seldom do) provide an exarnple of environmentally responsible behaviour by encouraging coordinated fuel efficient transport, reduction in the use of discardable packaging and recycling.

- Presentation of park features to establish a sense of place can significantly enhance the recreational and inspirational experience and modify behaviour toward cooperation with park management.

- Proposed reserves should be promoted through wide dissemination of factual information concerning their demonstrated benefits well before declaration. Extractive users should be targeted for detailed consultation.

- Reserves are irrelevant to some disadvantaged socioeconomic groups who cannot afford to visit them and do not have access to the educational materials necessary to develop an understanding of their ecological importance. Price discrimination to reduce numbers accessing a limited resource, while meeting resource protection objectives, further disadvantage certain groups and erode constituency support. Culturally relevant materials need to be developed to encourage appreciation (even if largely vicarious) for reserves among disadvantaged groups.

PROGRAM

Organisations visited (not in chronological order) and principal contacts with whom interviews were held.

UNITED KINGDOM:
British Museum of Natural History (London). Curators and Evaluation Coordinator.
Countryside commission (Cheltenham). Planners and Publications Officer.
Marine Conservation Society (Ross on Wye). Conservation Officer and Interpreter.
Dale Fort field Studies Centre (Dale). Director and tutors.
Purbeck Nature Reserve (Purbeck). Warden.

USA:
National Parks Service H.Q. (Washington). International Affairs Specialist.
Smithsonian Institute Natural History Museum (Washington).
S.T.Mather Training Centre (Harpers Ferry). Training Specialists, Production specialists, Interpretive Planners.
Everglades National Park (Florida). Superintendent, Interpreters and Rangers.
Biscayne National Park (Biscayne). Superintendent and rangers, Concessionaire.
John Pennekamp Coral Reef State Park (Key Largo). Assistant Manager and Rangers.
Key Largo National Marine Sanctuary (Key Largo). Manager and Rangers
Looe Key National Marine Sanctuary (Looe Key). Manager and Ranger.
Channel Islands National Marine Sanctuary (Santa Barbara). Manager, Assistant manager and Rangers.
Channel Islands National Park (Ventura). Superintendent and Rangers.
The Sea Centre (Santa Barbara). Education Coordinator, Director.
Yosemite National Park (California). Interpretation Coordinator and Concessions Management Specialists, Rangers.
Monterey Aquarium (Monterey). Interpreters.
Golden Gate National Recreation Area (SanFrancisco). rangers.
Hawaii Volcanoes National Park (Hawaii). Chief of Resource Management, Chief of Interpretive Services, rangers.

ECUADOR:
Galapagos Islands National Park (Galapagos). superintendent, Rangers and Naturalist Guides.
Charles Darwin Research Foundation (Quito & Galapagos). Director, researchers.
Cotopaxi National Park (Ecuador) Ranger.

CANADA:
Vancouver Aquarium (Vancouver). Head of Visitor Services, Head of public Programming, Educators.
Pacific Rim National Park (Vancouver Island). Chief Park Naturalist, Rangers.
Lake Loise National Park (British Columbia). Senior Park area Naturalist, Interpreters, Rangers.

DISCUSSION

UNITED KINGDOM

Introduction.

Conservation of habitat in the united Kingdom is largely the responsibility of private landholders. Nearly the entire land surface is utilised for agriculture, industry or human habitation. National Parks in the Australian sense of a Government owned and managed, large "natural" tract of bushland do not exist, although the National Nature Reserves (some of which are owned and operated by the Nature Conservancy Council) approach this concept. National Parks in Britain are declared over private land and managed through covenants between a variety of government agencies and the landholders. The principal objectives of this management seem to be the provision of access and recreational opportunity for the public, and the maintenance of the scenic quality of the landscape. The Countryside Commission and the Nature Conservancy Council are the two government agencies with a conservation remit. A startling plethora of conservation oriented Societies, Clubs, Councils, Commissions, Trusts, Institutes, Unions, Associations and Authorities exist, although the "Marine Conservation Society" appears to be the only organisation principally concerned with non-fisheries marine conservation.

More than eighty British Acts of Parliament have sections relevant to marine conservation, either as parts rather loosely concerned with conservation in general or to protect particular commercially important species. There is no coherent overview of marine conservation in legislative form, and no single coordinating agency. For an island nation with such a long maritime history, the UK has been remarkably late in addressing the ecological management of its surrounding waters. Protection of marine habitat in Britain presently takes the form of two small "Marine Nature Reserves" at Lundy and Skomer Islands and several small "special protection areas", though more reserves are proposed. These existing reserves were largely brought about through the voluntary efforts of the Marine Conservation Society. About 1370 Kilometres of scenic coastline has been declared "Heritage Coast", this provides little real habitat protection though development is controlled in the interests of public amenity.

The Nature Conservancy Council is presently conducting an extensive shallow marine resource assessment exercise using volunteer divers in an effort to identify suitable areas for reservation. As with most British conservation efforts this process involves a high degree of public participation and consequently enjoys some political support.

There appears to be a very strong nature conservation ethic among some sectors of the British community, with over a million people involved in some sort of conservation organisation. This high level of interest was described by one informant as "the preoccupation of the upper middle class". Regardless of its

socioeconomic representativeness, this interest generates a good deal of environmental education activity, much of which is broadly focussed and of wider relevance than the mountains of rather insipid "park experience enhancement" material which constitutes the majority of effort in some other countries.

The British Museum of Natural History (BMNH)

Principally a research agency, the BMNH spends about 20% of its budget on visitor services, nearly all of which is in the form of educational display design and maintenance. In response to perceived public demand, display material has been changed over recent years from biological curiosities to more purposeful and relevant displays emphasising ecology and environment.

The museum's Department of Public Services employs an Evaluation Coordinator who monitors the effectiveness of displays in achieving their public education function, as well as their interest value. "Front end research" is conducted before exhibits are designed to test public perceptions, interest, misgivings and understanding. When suitable subject matter has been selected after this analysis of "audience needs", rough mockup display components are tested using a volunteer audience. At this stage it is important that designers overcome their propensity to produce a "professional looking product" since obviously rough mockups are more likely to elicit the desired criticism from the test audience. Using these techniques, display designs are fine tuned to fulfil their designed function before they are built. This avoids the unfortunately common experience of "white elephant" displays which are sometimes built at great expense based on the best guess and artistic flair of interpreters. The museum presently holds displays of the old categorisation of stuffed and mounted curiosities juxtaposed to more modern cognitively interactive displays designed after the above mentioned research. This arrangement provides an opportunity to observe the relative effectiveness of the two modes. Children appear to be much more interested in the modern displays, however in some instances adults appeared more comfortable with the older displays. Possibly the evaluative techniques fail to take cognisance of the entrenched expectations of some of the museums more traditional clientele.

Countryside Commission (CC)

The Countryside Commission, based in Cheltenham, does not own land or manage any infrastructure. It does administer National Parks and provide advice and financial incentives to encourage environmentally sound land use practice, both within the parks and elsewhere. It is reminiscent of a luxuriously funded version of the Queensland National Parks and Wildlife Service "Community Nature Conservation Program". Much is achieved through cooperation with landholders, land managers and other public administration agencies. A total of 22,000,000 pounds will be spent on conservation initiatives this financial year. The majority of this is offered in the form of grants to organisations and individuals to assist in the rehabilitation of derelict or fallow agricultural land and for assistance in farm

planning to accommodate conservation and recreational objectives. Besides National Parks, the CC declares "Areas of Outstanding Natural Beauty". Such declaration strengthens local planning controls and grants are provided to reduce economic pressures on farmers within these areas to modernise and thereby destroy traditional landscapes. While several islands and stretches of coast are declared under this legislation, it has little effect on use of the adjacent marine environment. About 32% of the coastline of England and Wales is declared "Heritage Coast". These areas are owned privately or by the National Trust (29%), but administered jointly by the CC and local Authorities. Heritage Coasts are described in a CC brochure as an "850 mile exercise in coastal coordination and cooperation." Management for conservation of habitats, scenery and recreational amenity is achieved through coordination of existing development control legislation, negotiated land use conflict resolution and advice/funding of works such as track building and repair by volunteer groups. Most Heritage Coasts have a warden, partly funded by the CC, who provides extension and interpretive services. The "Heritage Coast Forum" was established by the Countryside Commission at the Manchester Polytechnics' Centre for Environmental Interpretation to act as central coordinating body for all of the different individuals and organisations concerned with Heritage Coasts. The forum produces literature and holds conferences and training courses. Individual Heritage Coast Services, with assistance from the Forum, provide guided activities, information centres and brochures. This convoluted arrangement of diffuse responsibilities does seem to maintain a high level of at least local public interest and involvement, perhaps generated in part by the inevitable social intrigue! The absence of a single, clearly demarcated legally responsible agency for coastal conservation may actually encourage greater public awareness of conservation issues, since concern cannot be easily devolved to the public service.

Marine Conservation Society. (MCS)

The Marine Conservation Society, based in Ross-on-Wye, is a voluntary organisation which generates funds for conservation work through membership subscriptions, donations (registered charity), corporate sponsorship and sales of books, shirts etc. Most of the work of the MCS consists of research into the impacts of human marine activities, lobbying and public education. The MCS fosters the formation of affiliated local groups who conduct a variety of activities including simple research projects, guided walks and displays. These localised activities are very effective at involving local people in marine conservation issues. Involvement is encouraged with professional help from the MCS by introducing people to the marine environment and its inhabitants in a "fun" setting, such as marine animal identification workshops and impact monitoring programs. The MCS produces a variety of publications which: inform of current issues such as sewage pollution, overfishing and antifouling paint toxicity, provide guidance for setting up local groups, and provide curriculum material for marine education in schools and other institutions. Another very successful activity of the MCS is the facilitation of "Voluntary Marine Conservation Areas". These areas "promote harmonious use of an area, whilst preventing the deterioration of the quality of the marine environment

and the life it supports". These areas are set up and managed by people who live and work in the area. Most have a management committee made up of representatives of the different groups who use the area such as fishermen, divers and boaters. Most committees have drawn up a code of conduct through mutual understanding of a common underlying purpose and concern conditioned by different use requirements. Nine such areas are actively "managed" through this scheme. The two existing Marine Nature reserves with enabling legislation mentioned above began as voluntary Marine Conservation areas, demonstrating the effectiveness of this approach.

The Field Studies Council (FSC)

The Field Studies Council is an environmental education charity with ten field study centres, three of which (Dale Fort, Orielton & Slapton Ley) are coastal. The Field Studies Centres provide accommodation, equipment and tuition and run formal to informal courses for groups from primary school to adult age. Originally set up as a system of accommodations for adult education, the centres now provide courses mainly for high school students with adults making up only 25% of the student intake. The Field Studies Centre at Dale Fort which I visited has a staff of 14 and takes about 2000 students per year. Recruitment of students is pursued through letters of invitation sent to schools and universities and advertisements placed in conservation magazines. Underpriveledged groups are not subsidised through any system of scholarships so patronage of the centres is unfortunately limited to a fairly narrow sector of the community. Courses vary from rather esoteric subjects such as "landscape photography" to more conservation-relevant exercises on coastal and sublittoral ecology.

The "Field Studies Council Research Centre" provides a contract environmental research and consultancy service to industry and government including impact assessment and resource surveys and sensitivity mapping. There is a small flow-on from these activities to the courses at the centres, however the research centre is essentially separate from the Field Studies Centres. Closer coordination, while slightly reducing the integrity of research results, may lead to more relevant course contents.

UNITED STATES OF AMERICA

Introduction

Aside from forests managed for timber production, there are a number of different types of reserves for conservation purposes in the US. National Parks, National Monuments, Historic Sites, Recreation Areas and a few other minor reserve types are managed by the National Parks service (NPS) of the Department of Interior. Nearly all civil management in these 337 reserves is carried out by the Service including criminal law administration and main road construction and maintenance. Also with the Dept.of Interior is the US Fish and Wildlife Service who operate reserves (many of which allow hunting) and regulate with respect to wildlife outside the various reserves. The National Oceanographic and Atmospheric Administration (NOAA) of the US Department of Commerce owns and operates a system of National Marine Sanctuaries. The Various State Governments operate parks and reserves which vary in purpose and legislative basis from state to state. Many reserves in the US receive very high rates of (often seasonal) visitation and present management problems of immense proportions by Australian standards. For instance, the bill for litter clean up alone for the US National Parks system totals 15 million dollars annually. These heavy impacts coupled with fairly insular enabling legislation have contributed to a traditionally inward looking environmental education effort. Most interpretive services are aimed at experience enhancement solely, and those with an environmental message are largely park management issue driven.

Special legislation sets aside wilderness areas in some national parks where access is restricted, however none of the marine parks or sanctuaries are zoned with restricted recreational access, possibly because the ratio of resource to users is already too small. Overuse is by far the most immediate management problem faced by the marine reserves, especially in Florida where warmer water year round attracts very high visitation. Again much of the public contact effort by managers of the marine reserves is intended to orient visitors to the resource and protect them from themselves. Americans can operate quite large vessels with no training or licence required. Many new, large and expensive boats end up on well marked reefs - with dire results for the coral!

National Parks Training Centre Harpers Ferry

The US National Parks Service operates two training centres: one at Denver Colorado and the other at Harpers Ferry near Washington. The Harpers Ferry Centre provides specialist training in all aspects of National Park work and supports an interpretive materials production facility. Much of the USNPS public contact planning, brochure, sign and display production and interpreter training takes place in this one centralised facility. Trainers are typically experienced park rangers seconded to the centre for several years although about 20% of trainers are

"outside" consultants. All new park employees undergo a one week orientation course and attend an eight week "ranger skills" course within the first three years of service. Much of this training focuses on public contact although interpreters undergo further specialist training both at the Harpers Ferry Centre and on their home parks. In recent years an increased emphasis has been given to extension training since the impacts of national park neighbouring landholders have become more acute and there has been an increased political awareness of the need for habitat management strategies beyond the National Park system. The US Fish and Wildlife Service and the National Oceanic and Atmospheric Administration run separate training centres.

Interpretive prospecti for the national parks are produced on-park by a team composed of the particular park's resident managers and interpretive specialists from the Harpers Ferry Centre. This approach ensures that a consistently high quality of interpretive services is offered throughout the country while ensuring that any park specific plan is situationally relevant and has the support of the local staff.

Production specialists, writers, cartographers and artists at the Harpers Ferry Centre produce displays for interpretive centres, wayside exhibits, interpretive publications and maps for the park system. While it is economical and efficient (in the product output sense) to produce interpretive materials in this way, conflicts appear to arise between park managers and production specialists. Park managers tend to be "goal oriented" and want to emphasise the management message whereas designers tend to a "process orientation" and concern themselves primarily with the attractiveness and holding power of an exhibit. A senior interpretive planner told me that "goals and objectives are harmful to good interpretation"! A seemingly critical lack of data on audience expectation and evaluation of existing facilities exacerbates these conflicts which often seem to stem from subjective value judgements rather than observations of product effectiveness.

At Harpers Ferry several interesting "guiding principles" are used when selecting suitable media for a particular situation. For example, exhibits are not used to encourage behaviour change but are used to provide orientation, whereas films, which are deemed ineffective for orientation, are used to convey broad concepts, evoke an emotional response and thereby encourage behaviour change. A comparison of the effectiveness of signage and a feature film both of which convey a "don't feed bears" message supports these assumptions. Exhibits designed at the centre are tending away from the traditional cognitive flow model toward an assemblage of stand-alone free choice components.

Several modern production techniques for outdoor and underwater signage were of great interest being superior in quality and cost to materials presently in use in Australia. Several materials which have recently been suggested for trial underwater in Queensland (like enamelled metal) have already been tested by the Harpers ferry and rejected. At Harpers Ferry, full colour printed styrene plastic signs (at about $100 per sign) have superseded the photo-etched aluminium signs (at about $1000 per sign) which are used in Australia. Sintered glass signs have been successfully produced for underwater use.

Everglades National Park

Of the forty million yearly visitors to Florida, one million visit the Everglades National Park. Another 4 million live, work and farm adjacent to its boundaries and upstream in its catchment. Included on the World Heritage List and on the register of World Biosphere Reserves in recognition of its unique importance to conservation, the Everglades National Park is reckoned by the NPS to be the most threatened National Park in America. It is essentially a vast mosaic of seasonal swamp and woodlands grading into mangroves and relict coral reef platforms. The integrity of the swamplands is dependant on the gradual flow of water from North and East of the park boundary. This water is increasingly diverted for agriculture and industry with the result that wildlife populations have declined (90% reduction of nesting wading birds) and phosphorus pollution is changing the plant species composition in favour of weeds. Recently, mercury contamination has rendered fish from the everglades toxic to humans. These dire threats to the park from activities outside its boundaries has encouraged a change in the focus of interpretive efforts away from the traditional style of American parks interpretation and toward a more "aggressive" extension and environmental education effort. Nearly all public contact from the park brochure to concessionaire-run boat and bus tours has a refreshingly direct message encouraging visitors to lobby for restoration of the Everglades' water supply. A strong program of school visits is run in the park and "outreach" services including addresses to community groups and media articles are well funded. This lobbying effort has obviously been effective since President Bush in December 1989 signed the Everglades Expansion Act which will allow some restoration of the hydropattern on the Eastern boundary of the park. The traditional glass of iced water which is tabled before most American restaurant meals has been replaced in numerous Florida establishments with a card inviting guests to request one only if they intend to drink it! While this small saving may be insignificant ecologically, it does provide a reminder of individual responsibility for the environment and keeps the issue topical.

To my mind it is unfortunate that many see an extension of the park boundary to be the only solution to water use problems which confront the park. This reinforces the concept that the park is for conservation and the rest is for exploitation. As the Florida population continues to grow, a more sophisticated approach to environmental management of multiply-used resources will be essential.

One of the major impediments to the extension efforts of the Everglades park staff is that a large proportion of the farmers working in the park catchment are economically disadvantaged hispanic immigrants from Central American countries, some of whom see the park as a "rich gringos playground" and do not share the conservation ethic of the educators. Hopefully the schools program is facilitating a more effective cross-cultural coordination of aspirations.

Park displays, audiovisual presentations, literature and personal interpretation provides an extremely professional, well researched and interesting account of the ecological systems of the Everglades. However the reasons for conserving this ecosystem beyond its immediate recreational benefits are not strongly stated. This

message is needed to offset the seeming provinciality of "saving the Everglades for the Everglade's sake".

Interestingly, the bus used by one concessionaire to conduct guided tours is run by an efficient propane engine. Visitors are made aware of this as an encouraging example of environmentally responsible behaviour. This was one of the few attempts to set an example of appropriate consumer choice which I saw on a reserve in any of the countries visited!

Biscayne National Park

This 600 square mile National Park includes an area of Florida's Atlantic coast, a large sheltered bay, vegetated coral islands and a system of coral reefs. It receives about 600,000 visitors per year (85% of whom are locals) and operates on a budget of 1.2 million dollars. 12-14% of the budget is allocated to public contact projects. In common with many marine reserves where access cannot be controlled through "park gates", many of the local boating community are apparently unaware that the area is a National Park and consequently pay no heed to park regulations. Eight patrol rangers operate 6 of the 14 park boats each day in an attempt to provide a visible management presence. Contacting users before they enter the park is seen as a high priority and as a consequence emphasis is placed on an electronic media campaign, orientation signs at boat ramps and widely circulated newsletters.

The long history of drug smuggling off the Florida coast, coupled with heavy visitation has influenced the style of patrols carried out in the Park. These are strongly enforcement oriented with heavily armed rangers checking every vessel boarded for fish harvest, safety equipment and general compliance with regulations. Patrols have a very minor interpretive or extension component. A floating visitor centre (8 metre pontoon boat with exhibits and equipped with a large helium balloon) is deployed in the park during fine weather. This and other visitor facilities are manned by volunteers who receive a two week intensive training course.

One commercial tour operator has a monopoly concession to operate on the park. This large glass-bottom boat operation is protected from competition by park management in the belief that assured profitability will allow capital investment into interpretive services. This is an interesting reversal of the common practice of allowing free competition to encourage the development of interpretive services as an indicator of tour quality in the search for a marketing "edge". It would appear that the approach used in Biscayne National Park takes bold cognisance of the fact that the interpretive component of many tours is seen by operators as one of the "frills" that can be abandoned when competition leads to cost cutting! Regardless of the economic theory behind the operation, the tour operator at Biscayne is an energetic exponent of environmental education who actively encourages his passengers to become involved in local conservation issues.

Public moorings are provided and vessels are prohibited from anchoring among coral. The number of moorings available sets a "defacto" carrying capacity for the park since once all of the moorings are occupied, additional boats cannot stay.

Many of the users of Biscayne National Park have an "extractive orientation" purported to be due to their Central American origins. Such destructive practices as pouring diesel on the water to calm the surface in order that sponges may be more easily seen for collecting are apparently common. The perpetrators of these practices are reported to be obdurate to traditional interpretive efforts so a major sociological study has been recently undertaken with the intention of developing an ethnically appropriate media campaign. The results of this study were not available at the time of my visit.

John Pennekamp Coral Reef State Park

Operated by the Florida Department of Natural Resources since 1960, this park attempts to protect 21 nautical miles of Florida's Atlantic coastline from the landward edge of mangroves to 3 miles seaward. There is a large bronze statue of Christ mounted on a concrete pedestal under twenty feet of water on one of the reefs in the park which, for some strange reason, is extremely popular with divers. John Pennekamp is one of the most popular locations for scuba diving in the world, with 500,000 visitors passing through the park gates and over 1 million arriving by boat each year. Park staff (of whom there are 20) and concessionaires run guided canoe trips, snorkelling, diving and campfire programs. All of these programs aim to encourage an awareness of the fragility of the parks ecosystems. Managers see adjacent land use as a great threat to the park so much of the environmental education effort is focussed upon mainland-marine interaction. A very aesthetically pleasing and well patronised slide presentation at the park visitor centre gives a good ecological overview, then emphasises the reasons for appropriate behaviour within the park and draws attention to the effects of adjacent land use on the marine environment. Manatees, an endangered marine mammal, are restricted in their American distribution to shallow coastal waters in the Florida region. They are particularly susceptible to injury and death from speed boat propeller strikes. Considerable public education effort is put into convincing the hundreds of thousands of boat owners to reduce speed in areas where manatees congregate. Incorporating the usual range of brochures, posters, displays, media articles and slide presentations, these efforts have so far met with limited success. Sadly, enforcement of "no wake zones" is more effective.

John Pennekamp is bounded on its seaward edge by the key Largo National Marine Sanctuary

Key largo & Looe Key National Marine Sanctuaries

These reserves, as part of the National Marine Sanctuary Program, are managed

by NOAA of the US Dept. of Commerce. These are purely marine reserves with no terrestrial component. Consequently, fishing and diving are the major uses, mostly conducted from private boats. As these are reasonably small reserves with few commercial activities, management problems are simple in nature though large in extent due to the intensity of use. As with most small, intensively used shallow coral reef areas, boat groundings and anchor damage to reef structures are the major immediate management issues. A system of mooring buoys is provided and a prohibition on anchoring among coral is in force. Touching or standing on corals is also prohibited. Such fine scale restrictions necessitate an intensive management field presence and enforcement effort. Uniformed, armed rangers in large imposing speedboats (confiscated from drug-runners) equipped with flashing lights and sirens, patrol the sanctuaries looking for infringements and warning boaters away from potential grounding situations. I doubt that much lasting rapport is established with sanctuary users through this method of patrol. Some senior managers expressed concern that management was seen to be coercive rather than persuasive and advised that some effort is being made to "tone down the enforcement approach" by encouraging rangers to use less intimidating vessels and to stow their firearms out of sight. It is unlikely that the reserve's fragile resources can be protected without a strong enforcement presence, however managers will have to establish good public relations before any complex environmental messages can be imparted. Generally the immediate urgency of sanctuary management needs are such that the reserves themselves do not effectively serve as venues for dissemination of a broader conservation message.

The management plan for Looe Key identifies three sets of interpretive programs vis: On site programs, Land based programs for "vicarious" users, and extension programs. On site efforts are essentially limited to the patrols mentioned above. A floating interpretive centre was considered but rejected on the grounds that it would contribute to overcrowding. Identification guidebooks are produced and tour operators are assisted in the development of interpretive services. Land based programs are largely focussed around the Sanctuary Headquarters and concentrate on imparting an understanding of coral reef ecological processes and the mechanisms of their vulnerability. As yet these programs are in a rudimentary state of development. Extension programs largely concentrate on special interest groups such as dive clubs although the supply of interpretive materials and advice to schools is given a high priority.

The NOAA Marine Sanctuary Program produces general marine conservation interpretive materials not necessarily connected to any one reserve. Among these products is a series of small but evocative brochures dealing with the causes and effects of marine pollution. Plastics pollution in the form of discarded fishing gear and other debris features prominently as an issue of concern where individual boater behaviour is an important contributory factor. Brochures dealing with these issues are likely to be effective in modifying behaviour if they are read by the appropriate audience. Unfortunately these interpretive materials have nothing that will "sell" them to their intended audience. Perhaps the same persuasively worded and illustrated messages would be more effectively targeted if they were integrated with some information which is normally actively sought by boaters such as tide

tables or navigational aids.

There is a proposal to declare a large portion of the Florida reef tract as National Marine Sanctuary, zoned to partition conflicting uses. Some local groups, notably the commercial fishing lobby are opposed to such a declaration. I saw a large roadside sign which read "preserve your heritage - NO SANCTUARY". The previous declaration of small reserves closed to commercial fishing without sufficient consultation with the industry has alienated these fishermen who then oppose any reserve proposal on principal. Ironically there are several studies from different parts of the world which show that closed areas can provide recruitment for restocking adjacent fished areas. The combination of adjacent open and closed areas produces more fish overall than would be the case were both areas open! Greater effort to impart information about the benefits of conservation strategies is obviously required to facilitate a smoother introduction of protective legislation.

Channel Islands National Park and National Marine Sanctuary

Eight continental islands varying in area from 1 to 249 square miles, lie off the California coast near Santa Barbara. Five of the eight islands and an area of sea extending one nautical mile from each of their shores are declared National Park. Surrounding the National Park to a distance of 6 nautical miles offshore is National Marine Sanctuary (totalling 1252 square miles, the largest in the US) and overlapping the marine areas of the National Park is California Dept. of Fish and Game Ecological Reserve. The various overlapping legislation effectively divides the marine reserve into zones with various levels of protection varying from no access, a total ban on any extractive activity to zones which allow regulated harvesting of fish and other resources. Forty plant species and several animals are endemic to the islands which have a post-indian history of hunting, grazing and agriculture. Marine resources are rich and varied due to the confluence of cold and warm currents. Kelp forests surround most islands and are inhabited by a wide variety of fish and invertebrates (including commercial species like abalone and lobsters). Several species of seals, dolphins and whales are common. Sea otters were once common but have been hunted to local extinction for their fur. Moves to reintroduce sea otters to Southern California have been vigorously contested by fishermen. Over a hundred shipwrecks of various ages are found within the sanctuary. Oil and gas reserves underlie the seafloor of the sanctuary and there are a number of oil production platforms offshore from the sanctuary which generate considerable shipping traffic. The potential for environmental disaster, highlighted by large oilspills in the recent past, is one of the factors which led to the declaration of the sanctuary.

Management of the national park and sanctuary is carried out by national parks staff subsidised by the sanctuary program. Several locations are permanently manned and a program of regular enforcement and extension patrols is run. These patrols appear to be less "gung-ho" than those in Florida parks, possibly in response to lower visitation, the absence of major drug trafficking and the generally more environmentally aware nature of the local populace. The National Parks

Service runs a major interpretive centre at Ventura Boat Harbour and a smaller one on Anacapa Island. A regular series of guided activities is run by interpretive rangers for visitors to the islands. A concessionaire operates tours to the islands.

The NOAA Sanctuary staff, having subcontracted much of the day to day management of the sanctuary to the national parks staff, and recognising the emphasis placed on personal interpretive services on the islands, have developed a concentrated program of off-park public contact. A "los Marineros" program which provides a "hands on" marine environmental education to school children has been funded for 2 years. A number of booklets, brochures, posters educational kits and a magazine is produced by the sanctuary program, as well as curriculum development materials for schools and a variety of awareness inducing activities like tours, beach clean-ups and competitions. The target audience for much of this educational effort is primary school children, who have been identified by interpretive planners in many organisations as societies' most responsive and accessible group. Apparently primary school children have cognition developed enough to grasp abstract concepts, are "innocently impressionable" but have not yet developed a system of obstructive peer pressures.

The Santa Barbara Museum of Natural History and the Channel Islands National Marine Sanctuary Program jointly operate an impressive educational facility on the Santa Barbara pier called simply, the Sea Centre. The pier receives an amazing two million visitors annually, 200,000 of whom pay $1.50 each to enter the Sea Centre. Additionally 12,000 school children annually use the Sea Centre on educational programs organised by the Sea Centre in conjunction with schools. The centre is staffed by a full time manager and an interpreter and offers "internships" to University students of Marine Biology. These internships provide direct experience in working with children as well as knowledge of the local marine environment. In exchange, the Sea Centre benefits through the injection of fresh ideas and free assistance with its maintenance and programs.

The Sea Centre is actually quite a small building, about the size of a two story house. Visible from much of the pier through large windows and acting as an attractant to the centre is a very realistic life-sized (huge) model of a grey whale. This marine mammal theme is used extensively throughout the Sea Centre and other interpretive facilities of the National Park and Reserve. Whales, dolphins, seals and sea otters effectively evoke a strong interest and empathy among many people and so are a good choice to introduce otherwise marginally interested people to the issues of marine conservation. Aside from the large aquarium stocked with local marine life, the most popular display at the Sea Centre is a computer operated video display on marine mammals. The display consists of a video monitor in front of which is an inverted "mouse" control set in the bench top and a button. That's it. No explanation is required, people easily discover how to review the programs available (short video segments) using the mouse and select the one they want using the button. Once visitors have become interested in the obvious and exciting, they are subtly introduced to some of the important but not so dazzling aspects of marine ecology and are soon pondering anthropogenic threats to the marine ecosystem and individual actions which can contribute to conservation.

Monterey Aquarium

This large and impressive aquarium on Cannery Row at Monterey is run by a non profit organisation. The facility is nearly always crowded to capacity despite the $8 entrance fee. The main feature is an enormous tank with large glass sides allowing a view of giant kelp forest and its inhabitants - an environment totally unfamiliar to non scuba divers. Interpretive labels which identify the contents of the tank are light, humorous and quippy. A considerable effort has been made to "spectacularise" marine life - with great success. A dark-field side-lit display of living jellyfish which emphasises their swimming movements with an eerie luminescence actually induces gasps of wonderment among many visitors who would normally be unimpressed at the thought of a slimy old jellyfish. A very popular display is a shallow aquarium stocked with sessile invertebrates and equipped with a macro focussing video camera. The video camera transmits images to a large video screen and is operated by visitors using a joystick with zoom and focus controls.

A colony of sea otters which have been rehabilitated after rescue from a recent North American oil spill are free to come and go between Monterey bay and the rock-pool area of the aquarium complex where they continue to be fed. This arrangement guides a cognitive transition between an appreciation of the intricacy and beauty of marine organisms encouraged by the various aquarium displays and the complexities hidden below the familiar choppy surface of the adjacent Monterey Bay. A single small display which addresses the problem of plastics and oil pollution makes a poignant understatement, the effects of which are shattered by the use of throw-away plastic packaging and eating utensils in the aquarium cafeteria!

ECUADOR

Introduction

Ecuador is a Spanish-speaking "developing" country which extends from the headwaters of the Amazon River across the Andes Mountains to the Pacific coast of South America. Ecuador also owns the Galapagos Islands, a group of 13 large islands and numerous smaller ones which lie almost 1000km offshore in the South Pacific. Ecuador's economy is based largely on oil and bananas, though tourism is providing an increasing amount of foreign currency. Ecuador is a democratic country with a population derived from various degrees of mixing between Spanish immigrants and the original South American Indian inhabitants. There are no restrictions on Ecuadorians moving from mainland Ecuador to the Galapagos Islands to live.

Conservation in Ecuador is largely the responsibility of the National Parks Service of the Ministry of Forestry. The Fundacion Natura is a small but energetic voluntary conservation group which lobbies on behalf of the environment and provides environmental education and advice to influential visitors and locals.

The Galapagos Islands National Park

The Galapagos are a group of mostly dry rocky volcanic islands which were uninhabited until recent times. They have generated great scientific interest since the famous visit by Charles Darwin in 1835 during the voyage which led to his theory of evolution. Settlement of the islands began in earnest after World War 2 though tourism in large numbers only began in 1969 with the arrival of a 60 passenger cruise ship. Settlement and tourism have since been rapidly growing and presently 2 jet airports support daily flights between the islands and mainland Ecuador.

Most of the Galapagos islands are low, rocky, dry and essentially inhospitable. Yet they are home to an extraordinary array of endemic plants and animals many of which are particularly vulnerable to extinction through predation, habitat change and competition from introduced species. Numerous animals native to the Galapagos have become extinct from these causes since Darwin's visit. Possibly because the Islands animals have evolved in the absence of humans, by and large they show no fear of people and allow a closeness of observation of animal behaviour unique in the world. In recognition of the scientific value, uniqueness and vulnerability of the Galapagos' flora and fauna, the Ecuadorian Government declared all uninhabited parts of the islands National Park in 1959.

Three of the larger islands which are high enough to attract a reasonable rainfall and therefore have soil, forests and a reliable water supply support settlements. The largest of these is Porto Ayora on Santa Cruz island where the Charles Darwin Research Station (CDRS) and the National Park Service (NPS) are based. The

CDRS is funded by donations to the Charles Darwin Foundation, an international organisation which receives considerable support from the World Wildlife Fund and the Smithsonian Institute. The CDRS operates on $US600,000 per year and donates a further 300,000 to the NPS. These two organisations cooperate closely to plan conservation and tourism on the islands.

International tourism on the Galapagos Islands consisted until recently of "environmental pilgrimages" by naturalists, however the Galapagos are rapidly developing a reputation as an exotic or curiosity destination. Domestic tourism is rapidly increasing with many Ecuadorians seeing the Galapagos as a holiday destination - free of malaria and peopled with rich "Gringo Americanos". Presently about 200,000 people visit the islands yearly (30%US, 30% non US foreigners, 40% Ecuadorians). Foreigners pay a $US 40 park entrance fee which contributes to park management throughout Ecuador (4.8 million $US p.a.). Likewise, foreigners pay relatively high airfares to the Galapagos on the Ecuadorian military airline and these subsidise airfares throughout the rest of Ecuador.

Tourist use of the islands is closely controlled and probably constitutes the best - regulated recreation management on a National Park anywhere in the world. Tourists **must** be accompanied by a trained NPS-approved guide and are only allowed access to certain "hardened" or less fragile sites. Despite the controls, visitors are able to examine closely most of the archipelagos wildlife and are provided with thorough and professional natural history interpretation. The guides are trained by the CDRS as "Naturalist guides" who hold a degree and speak english or "auxiliary Guides" who by and large speak only spanish and have completed a course conducted by the CDRS. Guide training largely focuses on the natural history of the islands and does not address broader environmental issues. Many international tourists arrive at one of the two airports and are immediately transferred to a cruise ship which takes them to various island destinations for day visits. Such visits, while very expensive, have very little impact on the local ecology since all food is brought from the mainland and most wastes are transported back with no need for any shore based infrastructure or support. A popular new style of tourism which places much greater stress on the local ecology is "backpacker" tourism. Visitors arrive, book into one of the local hotels and arrange for local converted fishing boats to transport them and their hired auxiliary guides to the various island sites. A booming industry has grown to service this new market which places great demand on natural resources to provide food and waste handling, and timber for hotel and boat building. This new industry has attracted much immigration from the mainland to the tourist "eldorado" since a days tour guiding can pay the equivalent of a months wages on the mainland. The population growth rate on the galapagos is presently 12%! As socially inequitable as the suggestion may seem, this deleterious trend in the style of tourism may have to be curtailed by the promotion of the Galapagos as an elitist experience, thus using economic partitioning to encourage low local impact tourism while maintaining the economic return.

Environmental education efforts by the CDRS and NPS, apart from some aspects of guide training, are all directed toward enhancement of the tourists experience. This

is a sadly predictable irony (given the economics of tourism in developing countries) since by far the greatest threat to the integrity of the Galapagos ecology is habitat destruction and introduction of noxious species by the local inhabitants.

CANADA

Introduction

Canada has a large system (180,000 square kilometres) of Federally owned and operated National Parks, and each Province of Canada has its own system of Provincial Parks. Four coastal National Parks have a marine component. Several of the Provinces, notably British Columbia, have declared extensive systems of small marine reserves about their coasts. In 1986 the Canadian Government launched its Marine Parks Policy with a publication which, while confirming an intention to declare an extensive system of marine parks, carefully spelt out the detailed process of consultation and conflict resolution processes designed to minimise the inevitable socioeconomic impacts. Several of the park selection criteria explicitly avoid potential conflict with existing uses by excluding those areas which support some kinds of commercial fishing, power generation, mining, intensive navigation and military uses. In this way the parks will be more like marine ecosystem preservation areas than holistic multiple-use marine management areas, even though a zoning system is envisaged. In attempting to generate the necessary support from provinces, native organisations, fishermen and the general public for the declaration of marine parks, The Canadian Government has recently increased the funding available to support marine environmental education efforts.

Interestingly, Canada earns considerable foreign revenue from salmon and timber which in some instances leads to conflicting uses of forested stream catchments. Timber is extracted by clear-felling which can result in erosion and siltation of the streams which salmon need to breed. Thus two commercial interests, forestry and fishing, which are usually united in opposition to conservation strategies not immediately concerned with maintenance of their exploited stocks, have been forced to consider broader concepts of resource allocation, with promising results.

Vancouver Aquarium

Famous for it's captive killer whales, the Vancouver Aquarium is an important marine educational facility for Canadians and foreign visitors. Displays vary in age, style and quality from fairly uninspired "fish tanks with labels" to spectacular multi sensory interactive exhibits. Four themes provide the context which cognitively links the various displays. These themes, (marine mammals, the Amazon, tropical colour & British Columbian underwater life) are promoted as bizarre and spectacular to appeal to as wide an audience as possible since the Aquarium is funded by it's gate takings. Most of the exhibits seemed to generate a rather detached interest in the visitors whom I watched until they came across the recently constructed marine mammals and Arctic displays which stimulated a contrasting excitement and involvement among children and their parents. While part of this attractiveness and holding power can be attributed to the usual anthropocentric interest which marine mammals generate, a large part of the success of these displays derives from the application of educational theory in their design. Unlike the interpretive material accompanying the older displays which concentrates largely on the identification of

the exhibited beast, the newer, more successful displays augment technically and aesthetically accomplished exhibits with relevant information which stimulates inquiry then establishes causative links. A display which sets out to impart information on a particular species of crab would typically be accompanied by text which immediately establishes the relevance of the display to the visitor, such as..."Do you eat crab? You might not want to eat this one ...".

Generally the educational efforts of the Aquarium seem to be designed to impart factual information about the natural history of the animals and plants on display and do not impart a very strong conservation message. Visitors gain an impression that these are marvellous and enthralling creatures. This impression may form the background for development of a protective attitude if people are later subjected to information about the plight of some marine ecosystems. It appeared to me that the opportunity to use the strong empathy for marine animals that is aroused on site to develop a concern for the future of the marine environment is not exploited fully.

Pacific Rim National Park

Pacific Rim National Park consists of three separate areas on the West coast of Vancouver Island. Two of these areas are long strips of coastline while the third is a group of small rocky islands. Most of the parks 500,000 visitors arrive in summer and visit the Long Beach section of the park. Pacific Rim has become a popular location for whale watching as grey whales and killer whales are commonly seen close to shore. A number of tour operators offer cruises and flights to see the whales. The park operates on a budget of around 1 million Canadian dollars and employs a staff of 70 people during the twelve week summer period of intensive visitation and 20 during winter. About 8% of the total budget is spent on interpretation and a further 15% on visitor services (half of which is used to fund the information centres). The major visitor centre, named the Wickaninnish Centre, contains a concessionaire-run restaurant and is unusually elaborate for a national park information centre. Often these facilities on parks in cold, wet climates act as surrogates for an actual experience of the natural setting that surrounds them, since bad weather can often deny visitors a chance to comfortably enjoy their surroundings. The principal subject of interpretation in the centre is that reliable standby...marine mammals. One entire wall of this large building is adorned with a very attractive and life like painting of whales and other denizens of the deep. this mural provides a mood setting backdrop to exhibits which explain aspects of the local marine natural history.

Interpretive effort during the brief summer period is intense with ranger-guided walks, slide presentations and a variety of other activities offered each day. The seasonal nature of the work allows interpreters to spend winter planning their activities, and to spend summer delivering them with zest. The professional standard of guided walks appeared to be consistently very high with a high level of involvement in the subject at hand encouraged and enthusiasm for the park's natural wonders subtly related back to broader environmental issues.

Park management has a strong user services orientation, and the marketing approach to public contact incorporates serious efforts to evaluate the effectiveness of programs. A common method of evaluation consists of monitoring the response to existing media of volunteers (who know that they are being monitored) using a standard pro forma. Evaluation forms and manuals on their application and analysis exist for visitor centres, pamphlets, trails and presentations.

The Pacific Ocean throws enormous amounts of litter and debris onto the park's beaches each year. Logs which have escaped their booms during timber harvesting operations form an extensive rampart along the high tide line. They have become accepted as part of the character of North East Pacific beaches and are utilised for firewood by people picnicking on the beach. The remainder of the flotsam however is removed in an annual "litter blitz" - a high profile public relations exercise using volunteers (mostly children) and coordinated by some of the parks cooperating associations. This year 240 visitors collected 3.7 tonnes of plastic bottles, ropes, nets, foam, batteries, tyres and other garbage from Long Beach. Local businesses donated prizes and the exercise was filmed for TV.

Environmental education efforts which extend beyond the immediate concerns of park management are largely oriented towards schools. An "edukit"of curriculum related environmental education material has been produced (at a cost of 20,000 canadian dollars) and distributed to schools, and local schools receive annual visits from park wardens. The large park theatre is well patronised by campers (again due to the often bad weather) and is used to deliver talks, films and lectures on the natural history of the park as well as subjects of wider relevance such as recycling, acid rain and other forms of pollution. Visiting biologists, environmental scientists and others are encouraged to give presentations to fill out the program.

CONCLUSIONS

This Churchill Fellowship took me to about 30 different reserves and institutions and allowed pragmatic demonstration and exchange of ideas with several hundred environmental education exponents and park management practitioners at all levels. A large part of the lessons learned can only be imparted in practice, indeed if this were not so then the benefits of the fellowship could have accrued from a simple study of the literature! Below (in no particular order) is an attempt to outline in point form the major findings of relevance to conservation education.

Display Design

Formative evaluation of crudely mocked up drafts and models provides valuable feasibility information on projected effectiveness of displays. Such evaluative methodology forces educators to rigorously define the purpose of displays allowing assessment of cost effectiveness before expenditure. Demographic characterisation and expectations of existing clientele is insufficient research for an assessment of the extent of the potential audience for a display. Provision of information is only effective after stimulation of interest. Information provided should be "layered", the most accessible layer designed to provoke, subsequent layers designed to yield information upon completion of a simple cognitive task (interactive). Park information centres in cold, wet climates act as surrogates for actual experience of nature and may draw visitors with limited time away from the principal feature. It is not desirable to recreate this function in Queenslands more benign climate. Corporate structure which separates field managers from production specialists leads to conflict between objectives: Designers are process oriented and focus on attractiveness and holding power of exhibit whereas managers are goal oriented and focus on information content (message). Displays designed for management purposes (eg. wayside exhibits) should be designed by a team of both designers and resource managers. Displays intended to encourage reasoned and environmentally responsible behaviour often successfully generate an interest in the subject but leave the development of responsive behaviour to chance. Generally the recreational enhancement objective of displays is easily met and evaluated but their often more important purpose of behaviour modification is poorly defined and consequently un-evaluated.

Conservation beyond the Reserves

To date over 1000 coastal and marine reserves have been declared worldwide. Most provide for the continuance of existing use while limiting park based impacts. The insignificance of arbitrary park boundaries to many ecological threats is accentuated in the marine environment since currents export many of the park's inhabitants across the boundaries into unprotected areas, and import pollutants on an almost daily basis. As a consequence, the establishment and management of reserves is only a small contribution toward the work that must be done to achieve

sustainable use of marine resources. Because the sea is vast and impossible to police, forms of persuasion other than regulation are essential; and yet few government institutions other than marine park agencies have a direct responsibility for marine environmental education. Most park management plans place public contact efforts in a priority order with visitor orientation and safety as a necessary first but off-park extension as an unfortunate last, from which position it's vital programs are usually starved of funds and remain forever on the "wish list". If marine parks are to remain relevant into the future, planners and managers will have to continually encourage efforts beyond their park boundaries.

Reserves as examples of responsible behaviour

Inherently special places are selected and managed as reserves to engender a sense of appreciation and respect for their natural setting. Visitors are often prepared to withstand a little discomfort in order to better appreciate natural values, this is certainly the case among campers! It is therefore appropriate to expect visitors to forego environmentally unsound conveniences and minor economies while on the park. Yet most reserves, even in their guidelines for market-protected concessionaires, don't encourage simple measures like coordinated transport, environmentally friendly packaging and recycling of wastes. The bulk of educational literature shows that providing example is the most potent form of teaching. A set of minimal standards should be adopted and assigned at least as much importance as is attached to graphics, corporate identity and the other hallmarks of quality.

Appropriate Presentation of Park Features

Some reserves are declared partly because they contain a remarkable natural feature, such as a waterfall or a particularly scenic stretch of coast. A great deal of the inspirational power of these places can be destroyed through inappropriate presentation. It is important to instil a certain sense of place through careful positioning of trails and vantage points, and facilities which might detract from the ambience. One of the worst examples of this kind of mismanagement can be seen at Stonehenge in England. Here one of the world's most famous archaeological relics with what was an imposing arrangement of stones, is passed closely on two sides by roaring motorways. A situation which totally robs the site of its sense of mystery and wonderment!

Careful generation of a sense of place can also be used for more pragmatic management purposes than experience enhancement. The mood that a style of presentation sets can encourage particular behaviours. At Yosemite National Park in the US a large and spectacular waterfall plummets into Yosemite Valley several hundred yards from a major road. A wide path leads from a car park at the road edge in a straight line to the base of the falls where a fence separates visitors from dangerously slippery rocks and swift currents. The most awe inspiring view of the falls is had from the carpark, with more of the falls (which are continuously visible from the path) becoming obscured from view as the base of the cliff is approached.

Finally the viewing area at the base of the falls is somewhat of an anticlimax. Disappointed at the lack of a sense of having reached a spectacular destination, a large number of visitors clamber past warning signs and explore the tumbled boulders at the base of the cliff. Several visitors die here each year. A more thoughtfully designed path which provided exciting glimpses of the falls on approach and ended at a satisfying vantage point may have saved some lives.

Introducing New Reserves

Many marine reserves are declared after being proposed by conservationist and scientific groups and are seen by extractive users of the area as a "win for the greenies" and a further loss to an often already beleagred extractive industry. Proposals for a marine reserve at the Isle of Scilly in Great Britain were bitterly opposed by the commercial fisherman's lobby, just as Florida's fishermen are actively campaigning against the proposed Florida Reef Tract Marine Reserve. These conflicts can weaken the resolve of politicians to pursue their noble intentions and often compromise the effectiveness of reserves which are declared. Much of this conflict can be avoided if the concept of a reserve is introduced cautiously and with particular attention to consultation with local industries. The British model of actively supporting and encouraging Voluntary Marine Protected Areas, which appeal to provincial jealousies and provide for wide community involvement appears to be successful in gaining support for reserve declaration. Especially when coupled with an active campaign to disseminate information on the benefits of reserves to fishermen and other "threatened" groups. Recent evidence that closed areas act as sources of recruitment for adjacent fisheries and other tangible benefits of reserves should be disseminated widely before boundaries or regulations are discussed.

Social Equity, Reserve Management & Environmental Education.

Conservation reserves are often seemingly irrelevant to some socioeconomically disadvantaged groups. Demographic studies of national park visitors show that they are not representative of the public at large, and tend to be economically and educationally advantaged. Socioeconomically disadvantaged people may not be easily able to visit reserves for recreational purposes and may not have access to the educational resources necessary to gain an understanding of their ecological importance. Many disadvantaged people are more interested in the equitable distribution of resources than in their conservation for appreciation by a priveledged few. Price discrimination, which can be used to limit the numbers of people using a scarce or fragile resource, further disenfranchises these disadvantaged groups and poses a long term threat to the integrity of the reserve's public support.

A concerted effort is required to make park recreational experiences more accessible and relevant to disadvantaged and ethnic groups, and to provide culturally appropriate educational resources which will enable an understanding of the ecological importance of conservation reserves by disadvantaged people.

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