

If they treated the whole world like a National Park: Environmental Education by teachers and rangers

Slattery Deirdre
Department of Outdoor Education and Nature Tourism,
La Trobe University Bendigo,
P.O. Box 199,
Bendigo,
Victoria 3552
e-mail d.slattery@bendigo.latrobe.edu.au

Alison Lugg
Department of Outdoor Education and Nature Tourism,
La Trobe University Bendigo,
P.O. Box 199,
Bendigo,
Victoria 3552
e-mail a.lugg@bendigo.latrobe.edu.au

If they treated the whole world like a National Park: Environmental Education by teachers and rangers

Short title: Environmental Education in National parks

Abstract

This paper analyses the role of rangers, teachers and a specialist education officer on school field trips to several National Parks. These shared encounters are commonplace events and have an important potential and actual role in environmental education, but have not been the subject of much research. Both the teachers' environmental education objectives and the possibilities offered by the park are wide: nature study, ecology, parks as natural and cultural heritage, land management and community issues and recreational activities and their consequences. However this breadth of potential activity possibly exacerbates a gap in the two cultures that meet on such encounters, a gap that needs to be addressed if the participants are to be able to maximise their shared and separate concerns.

Using semi-structured interviews, our research looked at the strengths and limitations of several school visits for both teachers and ranger. In this paper we report particularly on the importance of the ranger in the process. We suggest some guidelines for how the two parties can better operate to achieve their common and separate goals.

Key words: national parks, school visits, community participation, ranger training, teacher training

Introduction

Both schools and National Parks services recognise the significant role of education in and about National Parks. Many visitors to Parks are school groups: in fact the recent ANZECC Benchmarking Report on Park Interpretation and Education (DNRE 1999: 28) shows that the various park services in Australia and New Zealand identified schools as their second most important group of visitors. Parks recognise education's utility value: it can reduce visitor impacts or encouraging support for management programs. It also has community service value in citizens' enjoyment and appreciation of their heritage in parks (DNRE 1999: vii). Schools use Parks because prescribed content in several subjects directs attention to ecological studies, human-nature relationships, protected area management, conflict over land use and recreational activities and skills in the outdoors.

The development of environmental education across the curriculum also drives schools' interest in 'natural' places and adds a critical perspective to how curriculum and programs are shaped (Hungerford and Volk 1991, Fien 1997). Environmental education is often an overlay to other subject areas rather than being a subject area in itself, a situation that may involve some problems of teachers' knowledge and methodology (Dillon 2000, Lang 2000).

School visits to Parks: shared encounters

On field trips, practical trips and excursions to parks by school groups, two areas of expertise come into play. The teacher has a curriculum purpose, a methodology and objectives for specific learning outcomes. The ranger has expert knowledge of the ecology of the Park and skills in managing the human and other impacts on it. These two professionals also represent two institutional cultures, aspects of which overlap, but which also involve a different ethos, training, purpose and methods. For teachers the focus here is on curriculum, teaching practice and student development. For the rangers it is on interpretation, scientific training and land management.

Despite these differing ethics, intent and method, at both formal and personal levels, schools and parks share a common commitment to education and sustainable land management. In addition, both parties usually share a keen appreciation of the value of time spent in unspoiled natural environments. On the other hand, the actual detail of the purposes, expectations and practices of either group are often unstated and unexplored on such visits. Each party may assume that the other has a full and clear idea of the opportunities offered by the encounter, including responsibility for the various ingredients of success. This assumption, if not justified, can lead to potential gaps in communication and effectiveness, or at worst, outright problems for participants in the visit.

The research that led to this paper consisted of an exploratory investigation that aimed to map out some of the philosophical and practical matters that underlie environmental education encounters between parks and school groups. We examined the role of the two providers – teacher and ranger/education officer – during several Outdoor Education school visits to parks. We considered their objectives in environmental education, their practice and expected outcomes of the shared effort. Outdoor Education teachers frequently take their classes to National Parks, places where elements of the curriculum can be examined in an informed and focused environment, one dedicated to nature conservation, but where the value of the resource for recreational and educational use is also acknowledged. Their role is examined in the first of two papers that report on this research. This second paper focuses primarily on the rangers' perceptions about their role and value in relation to school visits to their park.

National Parks and education

National parks in Australia are managed at State level. They protect predominantly natural landscapes, those that are widely, if sometimes erroneously, accepted as places where impacts of post-European influence have been least. In Victoria, where this study took place, the National Parks Act (1975) states that their primary purpose is for the preservation and protection of the natural, wilderness and cultural values of the park. In this context, parks are for study of ecology, geology, and so on, relating to the conservation of the natural environment. This educational emphasis of the Act reflects the ethic of subordination of human activities to natural processes and defines the type of experience that most rangers would like to see humans having in parks.

National Parks in Victoria have a long history of citizen commitment to the 'the public interest' in parks (Hamilton-Smith 1998, Robin 1998, Slattery 2000, 2001). This commitment is supported and encouraged by park management tools for community consultation and education: that is, the driving ethic of these activities is that the parks depend on good public knowledge and appreciation of **their** parks. The main tool that has traditionally been used to address visitor education by the parks service is interpretation, defined classically by Tilden as:

...an educational activity which aims to reveal meanings and relationships through the use of original objects, by first hand experience, and by illustrative media, rather than simply to communicate factual information. (Tilden 1977: 8)

This view of interpretation fits well with the main strengths of both outdoor and environmental education, their capacity for first-hand interaction. Where it differs is in the kinds of meanings and relationship that could be conveyed in an interpretive encounter rather than an outdoor or environmental education one. In interpretation these normally focus on the ecological and cultural/historical values of the park and their meaning for current visitors. This is a different emphasis from the activity skills or personal and social development aspirations of many outdoor education programs or the problem centred critical analysis outlined by environmental education.

Outdoor and Environmental Education curriculum

The Outdoor Education curriculum at Victorian Certificate of Education (VCE) level is significantly and increasingly concerned with students' understanding of land management. It has recently integrated many aspects of environmental study with outdoor education into a new subject, Outdoor and Environmental Studies (BOS 2000). This has furthered the trend towards learning about the ecology and cultural history of places, as well as the traditional emphasis on enabling students to enjoy recreational activity whilst learning about environmental impacts – their own and others.

It is likely therefore that teachers' need for the environmental expertise of National Park staff, and the use of National Parks as outdoor education locations, will increase in the future, raising issues of the adequacy of, and processes used in, professional training and development (Dillon 2000). Meanwhile, the parks management authority, Parks Victoria, has not had a high level of support for ranger interactions with the public in recent years, preferring to replace face-to-face encounters with Webpages and contracted-out visitor services. The two Ministries responsible for the interactions of schools with parks (Education and Natural Resources and Environment) support only two teacher trained Education Officers located in parks (of which there are 36 in the State). The shortfall between these two concurrent areas of government responsibility appears to arise from reluctance to take responsibility by managers from each of the two agencies involved. A shortfall in availability of quality information and experience in the park is likely to lead to problems for Outdoor Educators and ultimately for those managing the land which they seek to use; thus making this study particularly timely and pertinent.

School visits to parks for environmental education objectives

There have been few studies of school visits to national parks from an institutional point of view, from that of the shapers of the program, the teacher and ranger. Many studies consider what students learn or how their values and attitudes are affected by their visit (Emmons 1997, Mangas, Martinez and Pedauyé 1997, Bell, Russell and Plotkin 1998, Ferreira 1998). However, these are mainly interested in assessing change by looking at the students' learning rather than at the structural aids or impediments to this educational process. In addition, these and other studies tend to consider the visit from one side or the other rather than as an interactive process between the two sets of expertise and between the two paradigms which drive the experience.

For instance, Beckman (1988) considers a Year 9 visit to a National Park entirely from the point of view of the Parks Service. She evaluates learning in the light of ranger objectives and specific information conveyed by rangers during a variety of short interpretive activities. She does not consider the role of curriculum, of the teachers' or the students' objectives, of what went before or after a park visit to contribute to its success or failure thus ignoring a major reason for the shortcomings of this visit.

The limitations of this approach are well commented on by Crocker (1991), who contests the common assumption that a park experience itself is sufficiently powerful to ensure positive environmental or educational outcomes. She sees the visit as a two-way concern, asserting that visits must be purposefully planned by the teacher in conjunction with park staff to meet the needs of the students. If attitudinal change is to be achieved, follow up and evaluation are also identified as essential processes in using National Parks for environmental education. Crocker recommends the employment of education officers in National Parks to develop specific programs for schools and the in-servicing of teachers in environmental education by the Parks Service.

Ballantyne (1998) finds that the disparity in focus and attitude that school groups bring to interpretive centres compared with other visitors means that often displays and fixed interpretation infrastructure, those interpretive tools most commonly devised by interpretation specialists, do not match their needs well. This point is also made by Tilden (1977) and Aldridge (1989). Ballantyne suggests that better understanding by interpreters of formal education processes, school curriculum content, needs of different age groups and attention to facilities and materials that suit schools needs would bring about better results from school visits to interpretive venues.

In addition, Ballantyne (summarising Knapp et al 1997) finds that although the general thrust of interpretation is to work for behaviour change, this tends to be applied to very specific site-centred objectives and short time frames, with limited carry over into other contexts. It is possible that interpreters, in focusing their goals on basic awareness aspects of environmental education, are wisely responding to the needs of visitors as they find them, not to abstract models of what 'should' be achieved. Their judgement is supported by the findings of the next stage in Knapp's research. In this, recognised experts in interpretation were asked to comment on the goals of interpretive programs from an

environmental education point of view. They strongly supported the focus that was found to exist on the 'consciousness raising' objectives of environmental awareness, sensitivity and so on rather than the more highly developed goals concerning critique of the way we live and how we can redress or prevent environmental problems.

This paper aims to look at some of these matters, specifically at how rangers see their role as interpreters in meeting the needs of environmental education face-to-face, what goals they have in such encounters and why they choose these.

Method

Since this study investigates the perceptions of teachers and national park staff it is based in a qualitative framework. It adopts a case study approach.

Four secondary school outdoor education field trips of two to four days were investigated. Schools were selected based on their intention to visit a national, and in one case, a state park, for VCE Outdoor Education. The teacher's objectives included both environmental education objectives and outdoor recreation activities (eg. bushwalking, navigation or cross-country skiing), to meet the purposes of the VCE unit being studied. The other important criterion for selection was that the teacher intended to use park staff as part of the learning process in the park setting. The park staff involved in the project were two park rangers (one in a national park and one in a state park) and a national park education officer (the same person for two school visits).

The methods of obtaining data were:

- Semi structured interviews with selected teachers and rangers before and after the park visit experience.
- Observation of the group during time spent with both the teacher and the ranger.
- Analysis of documentation relating to the environmental education aims and processes of the park visit.

Interviews were conducted with the teacher in charge of the outdoor education trip and the park ranger or education officer who interacted with the teacher and students during the trip. The interviews were taped and transcribed. Data were grouped according to themes emerging from interviews with each participant. Common and contrasting themes were identified for each group (teachers and park staff) and checked against field observations and documentation provided.

Research Findings

Rangers' objectives

Rangers were very aware of their responsibilities to Parks for educational purposes, but they differed somewhat from the teachers in their sense of what they could best offer. They were interested in what they thought the visit could achieve for the Park.

What I really try to get across to students is why we have National Parks and that they are important. But most important is who manages them and why we manage them that way. Why we bother - that's the message I'd like to get across to these students as my first priority and secondly is to give them an appreciation of issues that face the park managers.

Rangers wanted to present a positive public image of caring for the park and of ranger authority in it. They perceived that perhaps the most effective (and easy to deliver) role of the ranger was as an authority figure and representative of another worldview. It was important for students, especially those from rural areas, who might be park neighbours and future users, to see the park as an accessible part of their world, one that might even be of benefit to the farming community. This has to be seen in the context of often strong rural opposition to park formation and management as 'locking up the land', denying rural people legitimate traditional access to public land resources.

N's group coming from H-, it is pretty much a farmer orientated school so their vision of a park ranger is not what I believe to be the ideal relationship. They see us as the bad guys, locking up the forest, so if I can get kids to at least just come up and talk to us I think that's a barrier that we have broken down.

I think I can give those children an understanding of why that parcel of land has been put aside, not only for the educational values ..., it fits for the whole environment as well.... That without that reserve they might not be able to sustain their farming either.

On being asked to evaluate the time spent with the group, this ranger described how at the end of the visit:

...some of those kids came up to me which stood out I guess, that they approached me... so I was quite happy with that. ... I'd broken down that barrier so I was happy with that, that was an achievement.

In general, Rangers took for granted that they should present a solid organisational image of the value of scientific and management approaches. This was somewhat different from the curriculum perspective that requires that students critically assess the various assumptions that have shaped attitudes to the land at different times. This surely includes a critical perspective on scientific and technical management, but Rangers want to present the positive values of the park and to show that management addresses problems successfully.

Both rangers and teachers wanted students to see themselves as citizens in the park, to get a sense of the park as an historical artefact in which they could participate and for which they could influence the future. In this sense they were promoting the sense of the park as another aspect of the students' broader culture, one they may not have encountered or thought about before: 'Something to get them some ownership of it. So they feel part of it.'

The rangers' intent was to develop better citizenship in the students through appreciation of park values and support for management goals. They were concerned about the impact of large groups (including schools) frequently using the park for recreation activities without sufficient ecological understanding. Their purpose was also to develop a sense of what is appropriate enjoyment within a park setting with this important current and future user group, recreationists. The rangers wanted students to appreciate the hidden or more complex aspects of park management, the difficulties of matters such as fire management, pest plants and animals, as well as the more obvious minimal impact matters of rubbish, toilets, camp sites and so on:

I've tried to articulate to the students some of the impacts that occur in the park and how they come about. I mean they just don't appear out of nowhere ... Maybe considering the bigger picture rather than just looking at a fire on the ground - people might think of that's nice a little camp fire, nice romantic. Maybe instead of having that one image they will also think about where the wood is coming from, what's the scar going to be like? Once the fire's out what implications is that going to have on the soil and natural environment as a whole?

The teachers also recognised that rangers could add to their own and students' understanding of appropriate behaviour and re-inforce the ideas they were keen to communicate:

Now we've been here and seen the signs and talked with the rangers about needing to stick to the trails and how certain areas are now fenced off for regeneration because people have been taking those shortcuts for too long and they really make comments about people just shouldn't have been doing that. Whereas when we first come here they would have thought 'Great there is a new trail going in and a new place to hike', rather than how does this connect to the whole area.

The rangers had a wider view of the park than just their patch and role, and wanted to share this, to communicate the value of the park ecosystems and of the park system. In this sense rangers had an important curriculum of their own, although they wouldn't call it that, about broader conservation issues and students' lives:

Perhaps I've just planted the seed in their mind of things to consider in the future. Some of the associated impacts. Whereas initially they might have just seen modification of a natural environment such as a stream flow regimes to be not enough water, now perhaps they have thought about raw implications of manipulating those water flows and the other effects downstream to those current users. Just to get them thinking about cause and effect.

Rangers relating to teachers' objectives

In relation to the teachers' objectives, rangers felt more uncertain than they did about their own, although they valued the opportunity to have input to the students' experience of the park.

It helps if teachers have a background of understanding. I think they would like to impart some more technical detailed information to their students and I see that as a thing that we can provide.

But they were realistic about the constraints. The visit is only one of multiple concerns preoccupying the ranger's time: a brief opportunity to offer some information and understanding of parks and park management. The rangers recognised the limitations imposed by the time they had or were expected to offer, knowing that with the scope of material outlined by the teacher they could do little more than skim the surface of a great many issues. Because of this, there is a tendency to 'play it by ear.' They had reservations about their skills in presenting to the group, in handling the situation.

Often it is a bit hard. It depends on the groups Some groups will sit there and not take notes and won't say anything so it is really hard. It is like blood from stone trying to get them to talk to you. Other groups will be jumping out of their skin to talk to you. I don't really know how to deal with those different groups.'

As they lack the professional skill of teachers in effectively teaching complex concepts they tend to adopt a minimalist generic approach to presenting the park. This tends to be information-laden and falls somewhat short of both the practical on-ground detail and the approach to complex ideas needed for the assessment task:

I think they were interested but I think I overwhelmed them with the information I provided ... , I could have made it easier on them by not providing so much information. You always tend to think more is better, but it is not always the case.

Rangers know about ecology and park management but little about group management and educational processes. In addition they were conscious of the lack of detailed briefing between teacher and ranger and lack of knowledge of Outdoor Education curriculum. In this sense the ranger is somewhat at the mercy of the teacher on a school visit. The ranger does not know the curriculum, finds it difficult to select from or shape student and teacher knowledge and is aware that time and student interest and capacity are limited.

Rangers perceived that the quality of what is being asked of them is rising, that teachers are asking for more sophisticated material.

Nobody's just going out and kicking the footy or white water-rafting – it's getting involved in some issues associated with outdoor recreation, it's getting to the students who might be potential leaders of activities in the future about impacts on the natural environment.

However they still felt some concern that teachers don't always know enough to benefit from the park visit fully: 'You may not have any appreciation for those natural values'. They understand the need to educate the teacher as well as the students, but don't have the time or inclination to take on the extra effort required in carrying this out. This contrasted with the role of the Education Officer who saw it as explicitly part of his purpose and skills.

Role of the Education Officer

The Education Officer was able to bring out the unique opportunities for learning of both Outdoor and Environmental Education and National Parks. He could do this because he knew and understood the complexity of ecological understanding of the management issues in the park but could pitch them at a level appropriate for students. As one of the teachers observed, the Education Officer was able to do things that he couldn't, because of his role in the park:

Just the way he set up the whole session, going through step by step and also the knowledge of the area, I couldn't do that here. I couldn't set up sampling in the pond, and tracking and how people work to find information about or the research techniques needed to find out about population and health of the area. And ... to do some work in the area, bringing in the history of the area and how it should be managed. He is definitely needed in that area because I wouldn't have been able to do it and also I wouldn't be able to take the kids in there anyway.

The Education Officer was well aware of the role and value of the Park in the wider world:

There are the links with the environmental ethos which is not just while they're in Parks but when they're out of Parks. They're going to spend most of their life not in a National Park but an ideal would *be if they treated the whole world like a National Park* ... parks can provide them with an opportunity for experiences they'll get nowhere else and then they will be like an implant that they take away with them – you know like a fertiliser that keeps on dripping all the time.

Our interviews with the Education Officer highlighted the nature and extent of the 'gap' between his knowledge of the park and that of the students and teachers. In organising himself for the visit, he was able to question the teacher closely about the curriculum purpose, with specific knowledge of both the assessment task and how the park and its places and programs could match this. He explicitly recognised that teachers often lack specific ecological knowledge and so he purposely sets out to educate teachers as well as students as part of his objective:

I try to run them at two levels. One level is the student level at which I try to give them basic information and give them some reference points that the teachers can then use later on. At the second level I'm actually teaching the teacher so the teacher is up to speed on what is going on. Then they can draw upon those reference points later on, so their understanding and knowledge has increased.

The Education Officer consciously strove to establish a park management framework that the teacher could transfer to other places. He was able to select those elements about the park that best suited the group and curriculum. This included access to places and information that may not be recognised by a teacher or a ranger as valuable sites for environmental education. For instance a tour of the water supply and sewage system for the park offered valuable but usually hidden learning about impacts of people in the park. The teacher may not have looked for this and the ranger would not have considered it, as it lay outside normal material for park interpretation.

Shared responsibilities

Teachers appeared to take for granted that the ranger had a responsibility to deal with their visit, whereas the rangers were inclined to want more recognition of shared responsibility.

[There are] ... two ways to look at it. Parks Victoria do more interpretation stuff for school groups, and it's a statewide problem [of overuse] where the school applies to the park or interpretation service, or (the second way is) with the Education Department to deliver more environmental stuff in their outdoor education program so that they take away from the parks (responsibility) for interpretation... the pressure on the Park management to deliver that interpretation is put more onto the teacher.

But when pressed, this ranger accepted his role with schools, even though he felt that it was not adequately supported:

Look I think national parks have a very strong role in outdoor education as well as education as a whole. I see that as an important component of our jobs. That is where we sort of impart our ideals about our parks and management strategies. I mean management will never work unless it has the support of the community.

And this view was shared by the teachers, who valued the authenticity, the personal and specific knowledge of rangers rather than more generic information:

Yes – just someone who knows about that area. I think the ranger is the only one who can get across to the kids what is expected from them ... I can to an extent, but not in the same way the ranger can because its his backyard.

Discussion

As can be seen from the descriptions of Education Officer's contributions to environmental education above, encounters between rangers and school groups probably achieve less than they could. Our interviews with the education officer suggest that a great deal more is both possible and desirable and that this should not be hard to achieve. Although Ballantyne (1998) urges maximising the strengths of the qualities that interpretation and environmental education have in common, this needs to be based on a real acceptance of the limitations of each others' situation and approach. There are several issues here.

In arguing for more sophisticated interactions between interpreters and teachers, Ballantyne seems to be referring in general to interpretation specialists who are often people with educational training or other communication expertise. Such people, when they are employed by parks services, are usually not found in the parks working face to face, but rather in the Head Offices of parks services. There, they are able to influence practice primarily through ranger training, policy formation, or through developing tools such as displays that support and influence it rather than determine face-to-face interactions in parks. The question of quality of direct ranger expertise for visitor education therefore becomes a matter of budget allocation, of investment by the organisation in their training and support or in other interpretive tools.

As found by the ANZECC Report (DNRE 1999), most parks services do not supply a budget for interpretation that is commensurate with its stated value in their corporate statements. So how should this inadequate budget be allocated to get the greatest benefits? The ranger in the field is perhaps the most influential interpretive tool the park has, as reflected by the actual practice of parks (DNRE 1999: 33), so that the experiences rangers have to offer need to be carefully crafted and skilled, just as much as those offered by displays and on noticeboards. At present Ranger contact is a narrow conduit by which a great deal of informal, unrecognised teacher education happens. Rangers need specific schools educational materials and interpretive sites that suit curriculum needs in parks as well as enhanced training to adequately meet this function.

Too much should not be expected of a short interpretive encounter, which may be intense in quality, may light the spark of excitement and curiosity, but is necessarily limited in opportunities for development of ideas and for interactive processes. Rangers have a large amount of knowledge that they believe to be important in understanding issues and developing appreciative use of parks but only some of this can be communicated to school groups. In general the onus lies with the teacher to shape and develop programs for environmental education. They are able to utilise long time frames, to take a personal developmental focus for students, one with broad applications beyond the park.

Rangers were very aware of some limitations of their own contribution, in particular that students could not hope to understand and process all the elements involved in making sense of their own role in complex management issues in a short interpretive encounter. In addition, it would be unrealistic to expect that, even if rangers had a more finely tuned grasp on what teachers and students wanted to learn, that they would have the time and skills to shape their response to each visit around these more detailed expectations.

Further, from a critical environmental educational perspective, the rangers' presentation of their role and that of the parks agency needs to be viewed with a combination of respect and detachment. The respect is in response to the significant community and behavioural messages that can be conveyed. The detachment is necessary in order to critique the knowledge and perspective that is being offered. Teachers currently lack the finely tuned knowledge needed to develop this critique with their students, as it usually

depends on detailed understanding of social, cultural and environmental influences on park management processes.

Suggestions for ranger training

As Ballantyne points out, it is important for interpreters, whether they are rangers or those training and advising rangers, to recognise that environmental education in parks is part of a process and that parks can offer more by fitting in with that process. Some suggestions:

- Focus on cognitive frameworks that the teacher is building with the students. Perhaps this can best be understood by use of a word conscious approach aimed to build a common dialogue and to shape the kinds of experience that the park can offer students. These terms could be discussed and shared by rangers and teachers in developing the program for a school visit, and would avoid generic 'a bit of everything' ranger talks. For instance the terms 'habitat, rare, threatened, exotic and indigenous' suggest a very different park education program than 'vegetation communities, heathland, grassland, fire stick farming, burning regimes', even though both sets of words could apply to the same park.
- Simple techniques for monitoring and managing groups are an important part of ranger training. These might include small group activities and games, simple data collection techniques for specific sites or issues, observation checklists and 'tricks of the trade' in group management.
- Clear and unambiguous guidelines and booking procedures for schools visits to parks would help rangers to focus on several specific offerings for school groups based around particular themes, sites, and methods rather than a vague and generic presentation covering several topics.
- Rangers could benefit from encouraging repeat visits from the same teacher over several years, as a means of encouraging teacher development and independence. This already occurs of course, but could be encouraged more specifically.
- Joint professional development, or training opportunities through field days for teachers and rangers could encourage understanding and knowledge of each others 'patch' and improve skills.

Suggestions for park services

- Money spent on better informing and educating teachers about parks may be better invested than that on Visitor Centres and displays. In this way environmental education and interpretive goals could be more closely matched and integrated. In addition, interpretive techniques applied in non-park settings have a good deal to offer teachers in their teaching practice, as well as helping them with methods for working better in parks with their students.

- Specifically designated Education Officers who are regionally located could do a great deal to address generic professional development needs with teachers, using the skills and knowledge of both parks and teachers, as seen in the Education Officer's role in this research. In addition they could use their specific bridging role to assist with ranger development for working with school groups.
- There is a need for provision of curriculum specific teaching materials that go into more depth than the rather general interpretive materials available for most visitors. These would also be broader in their scope than interpretation normally would be, showing teachers how to develop and extend the learning possible on a park visit into broader environmental learning.
- It should be recognized that the management problems and community issues in parks are often the focus of teacher interest. For instance, materials that focus on management dilemmas or failures, sites that demonstrate 'before' and 'after' management treatment, sources of information that are critical of the park or its management are all important tools in understanding and appreciating the role of parks in the whole environment.

References

- Aldridge, D. 1989, 'How the ship of interpretation was blown off course in the tempest: some philosophical thoughts', in *Heritage Interpretation Volume 1: The Natural and Built Environment*, ed D. Uzzell, London: Belhaven.
- Ballantyne, R. 1998, Interpreting 'visions': addressing environmental education goals through interpretation, in *Contemporary Issues in Heritage and Environmental Interpretation*, eds R. Ballantyne and D. Uzzell, London: The Stationery Office.
- Beckman, E. 1988, Interpretation during a school visit to a nature reserve. *Australian Journal of Environmental Education*. vol. 4. pp. 4-9.
- Bell, A., Russell, C. and Plotkin, R. 1998, Environmental learning and the study of extinction. *The Journal of Environmental Education*. vol. 29. no. 2. pp. 4-9.
- Board of Studies. 2000, *Study Design: Outdoor and Environmental Studies*, Melbourne: BOS.
- Crocker, K. 1991. *Environmental Education on schools' visits to national parks*. Honours Thesis, Department of Education, Hobart: University of Tasmania.
- Dillon, J. 2000, On creating an environment for educational sustainability. *Australian Journal of Environmental Education* vol. 15/16 p. 127.
- Department of Natural Resources and Environment, 1999, *Best Practice in Park Interpretation and Education. A Report to the ANZECC Working Group on National Park and Protected Area Management Benchmarking and Best Practice Program*. Victoria: DNRE.
- Emmons, K. 1997, Perceptions of the environment while exploring the outdoors: a case study in Belize. *Environmental Education Research*. vol. 3, no. 3, pp. 327-44.
- Fien, J. 1997, 'Stand up, stand up and be counted: Undermining myths of environmental education', *Australian Journal of Environmental Education*. vol. 13, pp. 21-26.

- Ferriera, G. 1998, Environmental Education through hiking: a qualitative investigation. *Environmental Education Research*. vol. 4. no.2. pp.177-185.
- Hamilton-Smith, E. 1998, Changing assumptions underlying National Park systems *Celebrating the Parks: A Symposium on Parks History* at Mount Buffalo Chalet, Victoria. 16-19 April 1998.
- Hungerford, H. and Volk, T. 1991, Changing Learner Behaviour through environmental education. *The Journal of Environmental Education*, vol. 21 no.3, pp. 8-21.
- Lang, J. 2000, Tracing changes in teacher environmental education understanding. *Australian Journal of Environmental Education*. vol. 15/16, pp. 57-64.
- Mangas, V., Martinez, P. and Pedauy , R. 1997, Analysis of Environmental concepts and attitudes among biology degree students. *The Journal of Environmental Education*, vol. 29, no. 1, pp. 28-33.
- Robin, L. 1998, *Defending the Little Desert: the rise of ecological consciousness in Australia*, Carlton, Vic: Melbourne University Press.
- Slattery, D. 2000, Adult Environmental Education and Ecology. *Australian Journal of Environmental Education*. vol. 15/16, pp. 85-94.
- Slattery, D. 2001, Resistance to Development at Wilsons Promontory National Park (Victoria, Australia). In press, *Society and Natural Resources*.
- Tilden, F. 1977, *Interpreting our Heritage*. Chapel Hill NC: University of North Carolina Press.