Research Report

INTERPRETATION DURING A SCHOOL VISIT TO A NATURE RESERVE

Results of a survey of A.C.T. Year 9 students

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Abstract

Many teachers take students on visit to Nature Reserves or National Parks. The park management agency generally provides written information/ worksheets and an accompanying ranger to provide interpretation. Rarely are these visits subjected to formal evaluation in terms of achievement of environmental education objectives related to park conservation and management values. A pilot study of a school visit of Year 9 students to Tidbinbilla Nature Reserve (ACT) found that most students had a good background in terms of previous exposure to National Parks and environmental media, and the excursion provided both an enjoyable and an educational experience. However, there seemed to be a need for basic conservation and management values and ideas to be continually emphasised to ensure their full appreciation and understanding by students.

Introduction

It is common practice for teachers to take students to a National Park or similar ecological reserve: the potential value of the latter as educational resources has been discussed at length (e.g. Gilbert, 1974; Newbould, 1974; Fox, 1980; Webb, 1980), although Aldridge (1974) referred to the "curious and naive belief that taking parties of children from schools into the countryside is educationally beneficial regardless of what they do there". Fox (1980) considered that, ideally, such visits would be essential in the "rebuilding and reformulation" of environmental attitudes and philosophies towards conservation: this is the rationale for Australian park management agencies' involvement in both formal and informal park education and interpretation programs (Beckmann, 1987): most agencies generally provide written information/worksheets for school visits, and often an accompanying ranger will provide interpretation.

However, little work has been done to evaluate these visits formally in terms of achievement of environmental education objectives related to park conservation and management issues. As part of a research program investigating the effectiveness of interpretation in National Parks and similar reserves, a preliminary evaluation of a school visit to Tidbinbilla Nature Reserve (TNR) in the Australian Capital Territory was carried out in 1986.

Study Site and Methods

Study Site

Tidbinbilla Nature Reserve (TNR) comprises approximately 5500 hectares of eucalyptus forest and grassland about 40km from Canberra, and is managed by the ACT Parks and Conservation Service (part of the Commonwealth Department of the Arts, Sport, the Environment, Tourism and Territories). An unusual feature of TNR is that is contains several very large walk-through enclosures in

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which native wildlife species, namely the larger macropods, waterbirds, and koalas, are maintained in natural conditions. This virtually guaranteed viewing of generally elusive native species is the major attraction of the Reserve for most visitors.

The ACT Parks and Conservation Service describes the essential management theme of TNR as "the conservation of nature and the provision of opportunities for recreational, educational and scientific use" (Department of the Capital Territory, ACT Parks & Conservation Service, 1980). The original objective in the development of the Reserve was to create "a unique and notable area for the preservation and display of Australian flora and fauna" (Margules, 1968). Education programs within the Reserve were considered essential not only to enhance visitor enjoyment but also to contribute "towards an enlightened public sympathetic to the needs of nature conservation" (Margules, 1968). Interpretation and education in TNR is largely wildlife-orientated with a major emphasis on face-to-face contact (Fletcher, 1987). School-group visits to the Reserve are common and, with prior booking, a Reserve ranger will provide on-site interpretation.

School Visit

A half-day excursion to TNR comprised part of a series of outdoor education experiences for all Year 9 students from St. Edmund's College (Catholic High School, all-male, years 7-12) in the ACT. Although not directly linked to any specific curriculum topic the visit was intended to provide students with an opportunity to see and learn about several aspects of the Reserve. The excursion program, planned by school staff after a staff-only visit, involved:

* arrival at the TNR Visitor Information Centre (VIC).
* a 10 minute audio-visual (slide-tape) introduction to the Reserve.
* a few minutes spent in the VIC looking at exhibits and posters; a conducted (teacher and/or ranger) walk on the Turkey Hill Trail (a leaflet-guided walk based on the geology of the hill and granite outcrops adjacent to the VIC); and
* a ranger-led walk through the koala enclosure.

Each student was provided with:

* a TNR-specific interpretive leaflet on the geology of the Turkey Hill Trail, supplemented by school-devised questions; and
* a TNR-specific interpretive leaflet and worksheet on koalas; an Australian National Parks and Wildlife Service (ANPSW) leaflet on koalas.

Students were encouraged to read and complete worksheets on site. The rangers (chosen according to duty rosters) tended to use the worksheet as the basis for their interpretive talks.

Six mixed-ability student groups (ranging in size from 23 to 28, totaling 152) were involved. Five groups visited TNR on separate occasions in October and November 1986, following the basic excursion program described above: bad weather prevented one group's visit. All groups participated in a pre-visit survey, which involved a self-administered questionnaire handed out immediately prior to the visit. 5 groups (125 students) completed a similar questionnaire immediately after the visit. Students were asked to be as accurate as possible, and to give personal, rather than collaborative, answers.

The questionnaires were designed to elicit information on students' relevant backgrounds (previous visits to TNR and nearby National Parks; concepts of the value of National Parks; environmentally-related television viewing and magazine reading), knowledge (names of native and introduced mammals and pests; TNR geology; koala conservation), and visit enjoyment. As there were no explicit excursion objectives, it was assumed that the general cognitive aims of the worksheets and the effective aims of TNR interpretation were the working objectives. Knowledge questions were generally open-ended. Rangers were unaware of the specific questions being asked. As the aim of this study was to examine a typical interpretation program, no attempt was made to impose standards on conduct of visits: the rangers used their usual approaches.

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Results and Discussion

A. Pre-visit: Students' Relevant Backgrounds

There were no significant differences in pre-visit responses between visiting and non-visiting groups. These results are therefore based on all groups (n=152).

1. Previous visits to TNR and nearby National Parks

63% had visited TNR previously, 26% of these on school trips. 31% had been to Namadgi National Park (ACT), with again about a quarter during a school visits. 78% of students had been to at least one National Park in New South Wales within a half day's drive of the ACT, Kosciusko National Park being the most likely to have been visited (61%), followed by Blue Mountains National Park (49%). Overall, 92% of the students had had previous exposure to a National Park or similar reserve such as TNR, and for 55%, visits to National Parks had been part of family holidays.

This finding is in keeping with the data collected by the Australian Bureau of Statistics (1986 and pers. comm.) showing that approximately 38% of all Australians, and 44% of ACT residents, over 15 years old had visited at least one National Park or World Heritage Area in the twelve months prior to April 1986.

2. Contact with National Park rangers

47% stated that they had spoken to a ranger in a National Park (other than on a school visit). This is very encouraging as it suggests that personal contact between park staff and visitors is quite common (however, the ACT has many rangers in its urban bushland reserves, and students may have been referring to interpretive or regulatory contacts in those (rather than National Park) settings, despite the question wording).

3. Sources of environmental/wildlife information

7% claimed they always watched television programs on wildlife, 45% watched sometimes, 36% rarely, and 12% never. 54% read at least one major environmental/wildlife magazine. Results for individual programs and magazines are given in Table 1. Only 5% of the students stated that their parents belonged to any environmental association (including bushwalking or gardening clubs).

Thus, apart from previous exposure to park interpretation, and direct or indirect environmental education at school, general knowledge of the environment appeared more likely to have come from television programs than from magazine-reading or from parents who were environmental group members. This agrees with Eyers' (1978) report that 60% of Australian Year 10 students claimed their environmental knowledge came mainly from non-school sources, with 45% citing the mass media as the major source: similar findings have also been made in England (Richmond & Morgan, 1977) and in Israel (Blum, 1983). It is interesting that 82% of the students had watched the Harry Butler television programs: not only was it one of the few wildlife series to have been based on the Australian environment, but it also considered aspects of conservation and management as well as natural history.

4. Concepts of the value of National Parks and attitudes towards relevant environmental behaviour

Students were asked to give two main reasons for having National Parks. 92% gave at least one acceptable reason. Answers fell into four main categories: "preservation of wildlife"/"protection of animals" (61%); "preservation of plants and animals"/"protection of the environment/bush" (43%); "places for people to see animals"/"places for people to relax and enjoy the bush" (38%); and other reasons such as "for tourists"/"for native animal research"/"for education" (11%). The word "conservation" was rarely used, while "preservation" and "protection" were common.

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Table 1:
Relevant Television Watching/Magazine Reading Results
For Individual Programs/Magazines

TV program (year last shown in ACT)	% students (n=152)
Harry Butler series (1985)	80
Life on Earth (1985)	54
Living Planet (1986)	53
Australian Wildlife Club (1986)	28
none of these	12
Magazine	
National Geographic	47
Australian Geographic	21
Australian Wildlife	11
Habitat Australia	6
Australian Natural History	4
Ecos (CSIRO)	3
none of these	46

These reasons are in keeping with those given in the conservation literature (e.g. Lunney & Recher, 1979). The emphasis on "protection of wildlife" possibly reflected the students' pre-existing view of Tidbinbilla as a wildlife sanctuary. A relatively large proportion of students highlighted a "parks for people" rationale.

Post-visit, students were asked whether they agreed or disagreed with each of four attitude statements (1. "A good place to leave unwanted cats is in the bush": 2. "Shooting native animals for sport is ok as long as you are careful with the guns and no one gets hurt": 3. Trees and rocks are not important like animals so people should be allowed to scratch their names on them": 4. "The people of today should try to save areas of natural bushland so that people of the future can enjoy them too": identified and rated by Webb, 1980). 79% of students gave appropriate "conservationist" answers (No, No, No, Yes) to all four statements: for individual statements, the frequencies were 93%, 91%, 88% and 97% respectively. (Unfortunately, this question was not asked pre-visit).

Students were given a list of activities and asked to identify those which were allowed in National Parks (Table 2). 75% were able to identify correctly four or more activities, although 32% identified at least one prohibited activity as permitted. For example, relatively large minorities thought that collecting flowers and wood were acceptable (36% and 16% respectively). These activities are prohibited in all National Parks and most other ecological reserves, and wildflowers are protected throughout most of the ACT.

Almost all the students thus professed attitudes about environmental behaviour which met accepted environmental education objectives, although many students were confused as to what constituted environmentally unacceptable behaviour in National Parks. Eyers (1978), Richmond & Morgan (1977) and Blum (1983) similarly found that students' stated environmental attitudes were every much in keeping with expert opinions, while students' general environmental knowledge was low (interestingly, with boys being more likely than girls to give correct answers). Whether actual environmental behaviour by the students would indeed reflect their stated behaviour, and the extent to which a knowledge base is involved in their behavioural decisions, is obviously important in this context (see discussion by Eyers, 1978 and Lucas, 1982 among others).

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Table 2:
Activities Identified as Permitted in National Parks

Activity	% students identifying activity as permitted (n=152)
Bushwalking	95
Photography	94
Picnicking	91
Canoeing	66
Horseriding	53
Camping	53
Collecting flowers	33
4WD driving	16
Collecting wood	16
Trailbiking	5
Kangaroo shooting	4
Logging	3
Mining	2

B. Pre- and post-visit: Students' Relevant Knowledge

These results are based on the responses of those students who completed both pre- and post-visit questionnaires (n=125).

1. Enjoyment of visit

90% of the students stated that they had enjoyed the visit. Asked to state which of the four aspects they had most enjoyed and which least enjoyed, 59% identified the interpretive walk in the koala enclosure as the most enjoyable part, while 41% felt the Turkey Hill Trail was the least enjoyable (Table 3). As expected, different interpretive aspects of the visit appealed to different students, which justifies planning a variety of interpretive aspects within one visit.

The patterns of preference ranking were not identical for all five groups, suggesting that inter-group variability (the most obvious factor being the different rangers) was important in enjoyment ranking. For example, on both visits when a ranger did not accompany students on the Turkey Hill Trail, fewer students identified that section as "the most enjoyable". Similarly, on days when the audio-visual was preceded by a few minutes of introduction from the ranger, its rating as "the most enjoyable" was higher than on days when no introduction was made.

Undoubtedly the great majority of students enjoyed the visit, with the koala enclosure being the highlight for most. Preference ranking for different parts of the visit showed some relationship to the presence/absence of a ranger. This suggests that interaction with a ranger was perceived as enjoyable by students, either as a function of the "new face' phenomenon, or perhaps related directly to the ranger's specific input and knowledge. The relatively low ranking for the Turkey Hill walk, particularly when no ranger accompanied the group, suggested that the experience of being outdoors was not alone sufficient to generate enjoyment interest, but that this required extra input, from an interpretive ranger, and/or from an unusual experience (e.g. seeing wildlife)

2. Knowledge of native/introduced mammals and pest species

Asked to name six native mammals, 56% pre-visit, and 73% post-visit, were able to name four or more. 46% were able to name three introduced mammals pre-visit, with no subsequent change. 41% were able to name at least one pest species (plant or animal) requiring control in National Parks pre-visit: this increased to 59% post-visit. There was no specific interpretive

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objective for rangers to discuss introduced species or pests: again, however, there was inter-group variability which suggested that certain groups had been introduced to this topic, depending on the precise way in which their visit developed. These results indicate the potential scope for increased interpretation of the conservation and management problems associated with various introduced mammals and pest species.

Table 3:
Enjoyment Rating of Aspects of the Visit

Aspectof visit	% students who enjoyed this aspect most	% students who enjoyed this aspect least	mean preference ranking*
Audio-visual	14	14	1.5
Visitor Info. Centre	4	28	1.1
Turkey Hill Trail	21	41	1.2
Koala enclosure	59	16	2.1

* calculated by scoring 3 points for "most enjoyed", 0 points for "least enjoyed" and 1.5 points mid-range.

3. Knowledge specifically linked to visit

Knowledge related to geology -

Much of the outcropping rock at TNR, especially around the VIC and Turkey Hill, is granite, a fact mentioned in the audio-visual introduction, and in the interpretive leaflet on the Turkey Hill Trail. Post-visit 65% of the students knew this, compared with 20% pre-visit, indicating achievement of an obvious cognitive objective.

Knowledge related to koalas -

78% of the students responded correctly pre-visit to the open-ended question: "What do koalas eat?" (eucalyptus/gum leaves), an expected result given the animal's high profile and importance as an Australian symbol. Post-visit, correct answers were given by only 74%, although a further 17% gave imprecise answers which showed evidence of visit-gained, but misunderstood, information (e.g. "a special kind of leaf", "16 species of leaves").

Koalas are not common in the ACT. 79% of the students post-visit knew this, compared with 73% pre-visit. The status of koalas in the ACT was, therefore, apparently not clarified for those students who had given incorrect or no answers pre-visit.

One of a series of "true or false?" statements in the TNR koala worksheet stated that "Koalas are not endangered but have had their range restricted due to the destruction of suitable forest". The ANPWS leaflet similarly explained that the koala is not endangered, and the TNR interpretive leaflet further noted that "the population of koalas (in Australia) is increasing". Asked whether koalas are in danger of extinction, 24% of students gave the correct answer (no) before the excursion: post-visit, 33% did so, a very marginal increase in view of the information provided. This may indicate that the students used a subjective rather than an objective approach: students may have felt that "in danger of extinction" was equivalent to "need to be protected". These findings not only highlight students' possible misunderstanding of terms such as extinction and endangered, but also suggest that written information is not readily absorbed on-site and needs careful supplementation and appropriate emphasis by interpretive rangers.

Those students who did think

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that koalas were in danger of extinction (pre-visit n=85, post-visit n=83), or who weren't sure (pre-visit n=9, post-visit n=0), were asked to identify the most important two out of five stated potential threats to koalas (Table 4). The primary threat to koalas, habitat destruction and fragmentation, was the one most often identified pre-visit. Post-visit, koala disease had gained in relative importance as a major threat. The main source of information on the koala disease was undoubtedly the ranger: the issue was not mentioned in the koala worksheet, and, although described in some detail in the ANPWS leaflet, the latter was examined only cursorily by most students on-site.

Pre-visit, relatively high proportions of students identified shooting, poisoning and collection for zoos as threats to koalas. This raises interesting questions relating to the students' real understanding about the protection afforded to native wildlife (the shooting of koalas is illegal), food restriction (gum leaves are unlikely to be a source of poisoned bait) and the effects on animals of captivity (media emphasis on the deaths of some koalas in Japanese zoos may have been an influence here). Although there were post-visit decreases in the number of students identifying poisoning and shooting as major threats, some students still apparently had misconceptions.

The apparent albeit somewhat subtle change in the students' understanding of what constitutes the greater threat to the koala is worth considering further. While emphasising the threat by disease may be a worthwhile educational/interpretive objective, it may be potentially counter-productive in terms of explaining overall conservation strategies. The koala disease, although it can be made the subject of scientific research, could be seen as a "nature-induced" rather than "human-induced" problem: although students may indeed learn about the problem, their understanding might be that specific research is more important than general protection of habitat, despite the fact that it is the latter almost certainly leads to the stressed (overcrowded, inadequately nourished) koala populations which are more susceptible to disease. This also encompasses the more general conservation message that habitat protection is essential to protect very many other species.

Table 4:
The Most Important Threats to Koalas as Identified by Students who Believe Koalas are Facing Extinction

Major threat	pre-visit (n = 94)	post-visit (n = 83)
destruction of eucalypt forest for logging/building	80%	78%
a koala disease	52%	78%
being shot	28%	15%
being poisoned by eating poisoned bait put down for other animals	24%	16%
being captured by zoos for tourists to look at	16%	13%

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Conclusions

This pilot evaluation of a school visit to Tidbinbilla Nature Reserve showed that there are indeed educational and recreational benefits to be gained from such visits: it has also identified some areas of consideration for those concerned with nature interpretation to school groups. Visits to a National Park or Nature Reserve are likely to be very enjoyable experiences for students, particularly if they are able to observe wildlife first-hand. Students' attitudes towards conservation and environmental issues are likely to have their basis in previous visits to National Parks and interest in the relevant mass media, and interpreters may benefit from trying to gauge such knowledge and interest at the start of the visit. Ranger are probably more readily accepted sources of information than written material, at least on-site, and if possible, such face-to-face interpretation should be incorporated into at least part of the visit. It is possible, however, that students may still not gain as much in terms of understanding general conservation values as is expected from such a visit, although knowledge of specific facts may be increased: an overload of factual detail may lead to a misunderstanding or misapplication of fundamental conservation ideas unless steps are taken to ensure students have a firm knowledge base on which to build.

At a general level, interpretive rangers and teachers may need to reiterate the more basic conservation ideas and issues within the context of those specific park-related facts considered relevant to the visit. For example, all visits could include appropriate reference to: the behaviour appropriate to National Parks and similar reserves, and the rationale for such behaviour: the legislative protection of native wildlife: the differences between terms such as common, rare, endangered and extinct: habitat conservation as the single most important factor in species conservation: the necessity for careful management (and hence for prohibiting certain activities) to ensure that National Parks can survive as viable habitats, communities and ecosystems: and the existing conservation status of common native animals and plants, and the factors that might affect that status locally and nationally. By having such a fundamental conservation basis to all interpretation on school visits to National Parks and reserves, teachers and rangers could ensure that both students and managers benefit fully, and that such visits will indeed result not only in increased knowledge of facts, but a greater understanding of the whys and wherefores of conservation, and of the reasons for codes of conduct in National Parks.

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