ENVIRONMENTAL EDUCATION IN NEW ZEALAND SCHOOLS: RESEARCH INTO CURRENT PRACTICE AND FUTURE POSSIBILITIES

Volume 1: Summary of the research findings
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ENVIRONMENTAL EDUCATION IN NEW ZEALAND SCHOOLS: RESEARCH INTO CURRENT PRACTICE AND FUTURE POSSIBILITIES

Volume 1: Summary of the research findings

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EXECUTIVE SUMMARY

This report summarises the findings from the Environmental Education in New Zealand Schools research project, undertaken for the Ministry of Education by the New Zealand Council for Educational Research and the University of Waikato between June 2002 and June 2003.

The purposes of the research were to analyse environmental education practice in New Zealand schools to identify strengths and opportunities for future school practice, and to provide direction for the Ministry of Education and Government with respect to future initiatives in the planning, implementation and evaluation of environmental education in New Zealand schools. The research included three components: a literature review, a critical stocktake (survey) of nearly 200 schools involved in environmental education, and case studies of environmental education practices in eight schools and kura kaupapa Māori.

The research findings are reported in four volumes. This report (Volume 1) describes the overall research project, summarises the findings from each of the research components, and responds to the research questions. Volume 1 also highlights implications of the research for future policy, resourcing, practice, and research in environmental education in New Zealand schools. Volume 2 is the full report from the literature review, Volume 3 is the full report from the critical stocktake, and Volume 4 is the full report from the eight case studies.

LITERATURE REVIEW

The literature review explores the origins and development of environmental education during the last thirty years. The literature review describes how environmental education is related to a series of international summits and declarations about the environment and environmental issues. It also describes some of the challenges that environmental education raises for conventional practices in curriculum and pedagogy, and the problems and barriers that have hindered the integration of environmental into the formal education sector in many countries. Contemporary literature on environmental education emphasises concepts such as: education “in, about, and for” the environment”; student empowerment, responsibility, and decision-making; “action competence”; the recognition of environmental problems as society- and community-based problems; and a growing acceptance of pluralistic viewpoints about the environment.

There was little existing literature on environmental education practice in New Zealand, although some general characteristics of environmental education policy and practice in New Zealand were evident from the existing literature. These include:

- an emphasis on creating and exploiting links between programmes in schools, and extra-school agencies (e.g. regional authorities, conservation and environment societies, and other interest groups);
- the endorsement of “whole-school” approaches to environmental education;
- the advocated inclusion of Māori knowledge and values in environmental education;
• a tradition of education “in” the natural (and local) environment—e.g. through school camps, biology field trips, and learning experiences outside the classroom;

• the frequent selection of certain areas of content “about” the environment in school environmental education programmes (for example, biodiversity, local flora/fauna, nature conservation, water, air, waste and recycling, tree-planting and bush studies, and various aspects of gardening); and

• a central focus on the relationship between environmental education development, and the content of curriculum statements in the seven learning areas of the curriculum framework.

The literature review highlights some examples of international practice(s) in environmental education. Much of this literature stems from two major cross-national networks of activity involving environmental education in schools: the Environment and Schools Initiative (ENSI), and the Asia-Pacific environmental education networks. Both the ENSI and Asia-Pacific networks have generated a large amount of literature about environmental education policy, curriculum, and practice in a range of European and Asia-Pacific countries. The ENSI and Asia-Pacific networks suggested that the development of environmental education in schools is a demanding process that requires complex strategies for change. Strategies that these networks used to support the development of environmental education in schools included: international co-operation and sharing of ideas and strategies; a priority on linking environmental education resource development with teacher professional development; a transition of focus from individual school-based initiatives, towards more centralised support for environmental education; and a culture of action-research. These strategies appear to support environmental education development through an emphasis on supporting practitioners’ learning and professionalism, engaging practitioners in dialogue about the goals, aims, and purposes of environmental education, and by embedding continuous research and evaluation as a central facet of environmental education development.

Finally, the literature review gives examples of environmental education policy, practice(s) and research from six countries: Austria, the Netherlands, Norway, Australia, England, and the United States. The role of central agencies in these countries and states typically appears to evolve through a series of phases. First, there is a “mandating” stage, in which a decision is made about the policy and curriculum status of environmental education. Second, there is a “resource development, programmes and initiatives” stage, where central and regional agencies, NGOs, and other stakeholders in environmental education develop a wide array of teaching resources, services, and programmes intended to support the teaching of environmental education in schools. Finally, some countries move into a third stage, where the emphasis is on coordination of existing resources, programmes, and services, and on enhancing the quality of support for schools to make good use of these.

THE CRITICAL STOCKTAKE

The critical stocktake reports on the characteristics of 367 teachers at 193 New Zealand schools who are involved in environmental education in some way. The stocktake found that most teachers had been teaching environmental education for five years or less, although some said they had been teaching environmental education for as long as they had been teachers.
The stocktake found a great deal of enthusiasm about environmental education. The focus of teachers’ environmental education programmes tended to be education “about” the environment, with attention to encouraging students’ care and respect for the environment. Although many respondents described actions their students had taken “for” the environment, there was less evidence that student decision-making was a central facet of these actions. Many teachers indicated that they integrated environmental education into other curriculum areas, most often science, social studies, and technology. There was general support for a whole-school approach to environmental education, although only some respondents appeared to be engaged in whole-school environmental education projects and activities.

Environmental education topics and activities tended to cluster around activities in and around the school environment. Popular topics were waste management and minimisation, water studies, planting and gardening, resource management, and native flora and fauna. Environmental education was said to have a positive impact not only on student knowledge and attitudes but also their motivations for learning. It was also said to contribute to a better school and/or community environment, and to positive relationships between the school and the community.

Overall, only half the survey respondents were familiar with the *Guidelines for environmental education in New Zealand schools*. However, seventy-five percent of environmental education leaders and/or coordinators were familiar with the document.

The main restrictions on teachers’ environmental education teaching were time and resources to plan for action and to take action as part of their environmental education programmes. Some teachers also felt that the ambiguous nature of environmental education in the New Zealand Curriculum Framework created tensions for including it in their school or classroom teaching programmes.

**THE CASE STUDIES**

The case studies found a range of examples of environmental education practice in a diverse group of school contexts. The case studies included two primary schools, two area schools, one intermediate, two secondary schools, and a kura kaupapa Māori. The schools were each at different stages in their journey towards becoming an “environmental education school”, and the success and visibility of environmental education differed across the schools. However, some common themes and issues were found across the eight case study schools.

Common factors leading to the schools’ involvement in environmental education included: having one or more staff member with a personal passion for environmental education; the school’s involvement in formalised environmental education programmes (such as the Ministry of Education environmental education professional development programme); and a desire to use or protect the school’s local environment as part of the school’s teaching and learning.

Vision, leadership, and recent school changes were evident in a number of the case study schools. The schools’ values, culture, and philosophy were often consistent with the goals and aims of environmental education espoused in the international literature and the *Guidelines*. In many schools, “values” were an explicit feature of the school’s language and culture. Typically this involved “valuing and respecting yourself, valuing and respecting others, and valuing and
respecting the environment”. Māori knowledge and values had an intentional and visible role in the kura kaupapa Māori and four of the seven mainstream schools. The schools also tended to have proactive approaches to staff professional development, and encouraged student leadership and responsibility.

Environmental education practice in the case study schools typically began with activities in or near the school environment. Environmental education sometimes began to “snowball” across the school. In several cases, case study schools were committed to large-scale environmental action projects. Most of the case study schools were moving towards formalising their commitment to environmental education through its inclusion in school policy and planning documents.

Challenges and issues arising for the case study schools included:

- dependence on key people to provide energy and expertise in environmental education;
- the amount of time and energy required to sustain environmental education projects;
- getting other staff and/or Board of Trustees “on board” with environmental education;
- having sufficient resources/units/ideas for environmental education teaching and learning; and

- ensuring the sustainability of environmental education by developing school structures and policies to support it, planning for “sustainable” environmental education teaching or projects that can be sustained for successive cohorts of students; and

- having time to establish and maintain links with the community and environmental agencies.

**CONCLUSIONS AND IMPLICATIONS**

In the last section of Volume 1, we highlight implications of the research findings for future policy, resourcing, practice, and research in environmental education in New Zealand schools. Environmental education in New Zealand schools would appear to benefit from further strategies to support communication and dissemination of information about environmental education, including information about the *Guidelines*, and strategies to support networking and sharing of ideas and information about “effective” environmental education practice. Other areas for further consideration are: building on the initial professional development support some schools have received in environmental education; further consideration of the role of curriculum integration with respect to environmental education; identification of specific areas where schools need resourcing for environmental education; coordination in the development and delivery of programmes and resources to support environmental education in schools; and consideration of the visibility and status of environmental education.
INTRODUCTION

In 1998, the Ministry for the Environment developed a national strategy for environmental education entitled *Learning to care for our environment: Me ako ki te tiaki taiao* (Ministry for the Environment, 1998). The key priority for schools outlined in this strategy was to incorporate the aims of environmental education across the school curriculum. In 1999, the Ministry of Education published *Guidelines for environmental education in New Zealand schools* (Ministry of Education, 1999). This document links with *Learning to care for our environment* and shows how environmental education is a theme in all seven learning areas of the New Zealand Curriculum Framework.

The *Guidelines* promote an integrated curriculum approach to environmental education, and are intended to assist teachers and schools to plan and provide education in, about, and for the environment. However, there is no mandatory requirement for schools to teach environmental education. The extent of environmental education within the individual school curriculum is determined by the school and its Board of Trustees.

To date, the Ministry of Education has funded three specific programmes to support the *Guidelines*. The first two of these were *Environmental Education Professional Development* (Christchurch College of Education) and *Professional Development for Sustainable Organic School Gardens* (Massey University and the Soil and Health Association of New Zealand). Funding for both these programmes ended in June 2003. In 2002–2003, the Ministry-funded Environmental Education Advisors programme began. This programme funds seventeen regional environmental education advisors, whose role is to support schools and kura in their region to incorporate environmental education into the curriculum. The Christchurch College of Education was contracted to coordinate the programme.

PURPOSES OF THE RESEARCH

The Ministry of Education wanted to investigate the impact of environmental education in New Zealand schools, particularly with respect to the *Guidelines* and its related supporting initiatives. In June 2002, the Ministry of Education commissioned the New Zealand Council for Educational Research and the University of Waikato to research the implementation and impact of environmental education in New Zealand schools.

There are three purposes for the *Environmental Education in New Zealand Schools* research. The first two of these were given in the Ministry of Education’s original request for proposal. The third was added following feedback from the Ministry of Education of other reviewers on early drafts of the research. These purposes are:

- to analyse environmental education practice in New Zealand schools to identify strengths and opportunities for future school practice, and to provide information that can be used to inform New Zealand schools’ environmental education programmes;
• to provide direction for the Ministry of Education and Government with respect to future initiatives in the planning, implementation, and evaluation of environmental education in New Zealand schools; and

• to facilitate further discussion between New Zealand policy-makers, researchers, and practitioners in environmental education about the way in which environmental education in schools is conceptualised, discussed, practised, and researched in New Zealand.¹

To meet these purposes, the research addressed the seven research questions below.

**RESEARCH QUESTIONS**

1. What are key characteristics of effective practice in environmental education nationally and internationally that lead to students developing and demonstrating the skills, knowledge, attitudes, values, and actions that support the aims of environmental education?

2. What are some of the larger similarities and differences that exist between international practice and New Zealand practice, including the role of central agencies?

3. What are the key characteristics of environmental education practice in schools/kura in New Zealand at this time?

4. To what extent do environmental education programmes in New Zealand schools generally follow the planning process identified in the *Guidelines for environmental education in New Zealand schools*?

5. What kinds of student learning opportunities in environmental education occur as a result of the implementation processes undertaken by New Zealand schools?

6. What kind of relationships exist between different environmental education services and programmes for schools, and what are the potential benefits of these relationships for student learning?

7. What are the characteristics of the delivery of environmental education in the case study schools that support/do not support the goals of environmental education?

¹ The rationale for adding this third purpose emerged from comments made by reviewers and the Ministry of Education on the first draft of the literature review. For example, one reviewer said the first draft succeeded in “drawing together multiple complex strands within environmental education” but did not sufficiently address “gaps in the way the field is conceptualised both here and in New Zealand” (Reviewer comment, February 2003). Another reviewer noted “there is lots of reporting on what is being done or not done but a lack of in-depth dialogue among practitioners about the nature of EE. There is a lack of in-depth philosophizing about key concepts and ideas etc. In particular there is a lack understanding of terms like [education] ‘for’ the environment and the role of political action as well as practical action….We [New Zealand] also have little in the way of a strong thinking forum where this can happen…” (Reviewer comment, February 2003). Feedback from the Ministry of Education said “Although the guidelines provide a definition of Environmental Education and this is the last formal comment from the MOE, we would like the literature review to explore the influences on NZ understandings of EE since the guidelines were drawn to provide a contemporary view…we acknowledge that defining EE beyond official documents is problematic because of sometimes highly diverse positions, but even a sense of different perspectives/approaches would be useful for assessing the current fit of the guidelines, and the programmes…described [in the literature review].”
SCOPE OF THE RESEARCH

The research was made up of three key research components.

Component one: A review of national and international research literature on successful practices in environmental education, to compare some of the larger similarities and differences that exist between international practice and New Zealand practice.

Component two: A critical stocktake of current environmental education programmes and services in New Zealand schools, involving a survey of the characteristics of current environmental education practice in approximately 400 schools/kura in New Zealand.

Component three: Eight case studies of environmental education in selected New Zealand schools/kura.

TIMEFRAME FOR THE RESEARCH

The timeframe for the research was June 2002–May 2003 (Figure 1). The initiation of the three research components was staggered over the 11 months, with the literature review beginning first, followed by the critical stocktake, and then the case studies. NZCER took primary responsibility for the literature review, the University of Waikato took primary responsibility for the critical stocktake, and the case studies were divided evenly between the two institutions.

The first draft of the literature review was sent to the Ministry of Education and seven other people engaged in the field of environmental education in November 2002 with a covering letter requesting feedback. Feedback from six reviewers was received by February 2003, and the draft was restructured and revised to address the suggestions and points raised by the reviewers. The second draft was given to the Ministry of Education in mid–May 2003 for final feedback and comment. In June 2003, the critical stocktake and case study components were completed, and the findings of the three research components were synthesised in this report.

REPORTING OF THE RESEARCH

The research findings are reported in four volumes.

Volume 1: Summary of the research findings.

Volume 2: A review of national and international literature on environmental education practices (Bolstad, Baker, with Barker, and Keown, 2004).

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2 The peer reviewers included two members of the NZCER/Waikato University evaluation team, two tertiary educators from two different education institutions, and two people working in non-governmental environmental education organisations.
Volume 3: A critical stocktake of the characteristics of effective practice in environmental education in New Zealand schools and kura kaupapa Māori (Cowie et al., 2004)

Volume 4: Case studies of environmental education practice in eight schools and kura kaupapa Māori (Bolstad, Eames, Cowie, Edwards, and Rogers, 2004).

This document (Volume 1) provides an overview of the entire research project. It brings together the main findings from each of the three research components and responds to the seven research questions. The last chapter discusses the implications of the research for future environmental education policy, resourcing, practice, and research in New Zealand. Volumes 2, 3, and 4 give full details of each of the research components.
Figure 1

Timeline for the research components

2002 2003
Jun Jul Aug Sept Oct Nov Dec Jan Feb Mar Apr May June

Literature review
Develop literature review framework
Meet with MOE to review framework

Critical stocktake
Identification of potential case study schools
Questionnaires sent out to schools
Planning and preparing for case studies

Case studies
3 case studies
5 case studies

First draft literature review
Feedback on draft from MOE and other reviewers
Revision of draft

Second draft literature review
Critical stocktake planning and instrument design

Data entry and analysis

Second draft literature review

MOE feedback

Final version of literature review

Overview report
METHODOLOGY

The three research components were designed to provide enough information about environmental education practice in New Zealand and internationally to answer the seven research questions. Each component contributed different kinds of information towards this end. This section details the main objectives and methodology for each of the components.

THE LITERATURE REVIEW

The literature review was mainly intended to provide illumination on the first two of the seven research questions, namely:

- What are key characteristics of effective practice in environmental education nationally and internationally that lead to students developing and demonstrating the skills, knowledge, attitudes, values, and actions that support the aims of environmental education?

- What are some of the larger similarities and differences that exist between international practice and New Zealand practice, including the role of central agencies?

The literature review had four main objectives:

1. To collate existing literature on environmental education in New Zealand, and therefore, to develop a preliminary picture of the context for environmental education in New Zealand schools at this time.

2. To identify examples of environmental education approaches and practices in other countries, which can be compared to New Zealand approaches and practices.

3. To highlight some of the current issues for environmental education in New Zealand and indicate possible directions for future policy and practice.

4. To provide a foundation for the critical stocktake and case studies components of the research.

Literature review methodology

In order to make decisions about what literature to review, and how to review it, we considered two approaches to reviewing literature that have been promoted as useful for informing policy and practice: the “systematic review” and the “user review”. The systematic review methodology, adapted from research in the medical sciences, is increasingly being used in education and social policy research in the UK and New Zealand. This form of review seeks to synthesise the findings from all relevant existing research (Boaz, Ashby, and Young, 2002). The rationale for the systematic review approach is to more fully exploit the knowledge base stored within existing data and research findings, in order to support better evidence-based policy and practice decisions. In the systematic review, a thorough, unbiased search strategy is adopted to identify relevant studies, using a variety of search methods, and searching multiple, possibly overlapping, sources of information (Glanville, 2001), and the reviewing process is carried out to agreed standards (Boaz et al., 2002).
On the other hand, the user review is an emerging methodology that has developed specifically within the field of education research. The approach is relatively new, and potential models for the process are only just beginning to be reported in the literature (Bassey, 2000; Rickinson, McLeod, and Rogers, 2002). A characteristic of the user review is that researchers and research users work together to devise the methodology and parameters for the review. The user review is meant to facilitate more effective communication with the “users” of research (for example, practitioners and policymakers), by bringing together the findings of research to critically inform the thinking of a particular audience of policy-makers or practitioners, and to stimulate discussion and worthwhile educational action (Bassey, 2000). Germaine to the Environmental Education in New Zealand Schools research is a current project by the UK National Foundation for Education Research (NFER) entitled “Education for sustainable development (ESD): making research count” (Rickinson, 2002). In this project, a researcher prepared a systematic academic review of research literature on environmental education learning. The review itself took approximately one year to complete. The researcher then spent 12 months working with a small group of practitioners (primary and secondary teachers, and non-school environmental educators) to explore the practical implications and potential uses of the research findings, and ways of communicating these in engaging ways to practitioners in a “user review”. The intended outcomes of the above project are to generate an innovative document and Website for teachers, highlighting recent research relating to ESD.

A major strength of the user review approach is that it provides an avenue for accessing the knowledge and experience of practitioners, researchers, and policy-makers, while also assisting users to identify the amount and nature of research evidence available to support or contest that knowledge. However, a limitation of the user review as defined by Bassey (2000) and Rickinson et al. (2002) is the large time and budget required to produce the first-stage academic review, before the second-stage user review can be developed.

We felt that neither approach on its own would be sufficient for the current review. Therefore, our review approach fused elements of both the systematic and the user review methodology. The rationale for using this approach took into account the findings of two recent comprehensive reviews of the international field of environmental education research (Hart and Nolan, 1999; Rickinson, 2001). Several important points emerged from these two reviews:

- Recent environmental education research is complex and varied in focus, methodology, methods, and theory.
- Systematic reviews of research evidence in the field of environmental education appear to provide only general indications about what is “effective” environmental education practice, and these are strongly dependent on specific contexts and circumstances.
- There appear to be few studies which have focused on the impact or effects for students of particular environmental education programmes or practices. Even fewer studies have focused on student outcomes or impacts of regular environmental education provision within the mainstream school curriculum.
- Systematic reviews of research in environmental education can give a clear picture of what has, and has not, been researched. Their findings do not seem to translate into clear implications for policy or practice.

One further issue weighed against using only a “systematic review” approach for this review: namely, the paucity of published environmental education research in New Zealand, compared to
the amount published in the international literature. Initial searches and information from colleagues in the New Zealand environmental education community indicated that currently there is very little completed research (published or unpublished) on school-based environmental education practice in New Zealand. On the other hand, the international literature on environmental education appears to be extensive and diverse in type (Hart and Nolan, 1999).

This imbalance raised two questions for the reviewers about how to review and integrate the New Zealand and international literature. Namely:

- what criteria should we use to review and evaluate the international literature, to provide relevant and useful information for informing New Zealand policy and practice in environmental education? and
- what parameters should we use to search for and evaluate evidence of environmental education practice in New Zealand schools?

The question of “what constitutes evidence” is particularly problematic for systematic reviews of research evidence. In a critique of the “systematic review” approach in education, Solesbury (2001) points out that there are more kinds of evidence than just research evidence. For example, professional knowledge comprises not only researched knowledge, but also contextual and organisational knowledge. Some of this knowledge is explicit and documented, but much is tacit and carried in people’s heads. On the other hand, validity and availability are significant problems with unpublished knowledge. Nevertheless, a bias towards published research evidence may exclude these other important forms of knowledge. A “systematic review” approach did not seem to offer answers to either of these two questions.

Given that informing policy-makers and practitioners was of paramount importance in this research, it did not appear likely that a systematic reviewing approach would yield the sort of information required. Therefore, we used elements of the “user review” approach (Bassey, 2000) to strengthen the review’s usefulness for critically informing future policy and practice in environmental education in New Zealand. A key element of the review process was consultation with a variety of New Zealand stakeholders in environmental education during the development, writing, and revision of the review.

In the early stages of developing the literature review and the critical stocktake, we consulted with a wide range of New Zealand environmental education stakeholders, including tertiary-based environmental educators, local and regional government staff involved in environmental education, and graduate and post-graduate students currently involved in environmental education research in New Zealand. This was done through a number of face-to-face meetings, and frequent use of telephone and e-mail. Two focus groups were also convened (discussed further below). Stakeholders were informed about the purpose of the research and asked to indicate relevant material or sources which might be useful for the review.

**THE CRITICAL STOCKTAKE**

The critical stocktake sought mainly to provide evidence for research questions 2, 3, 4, and 6, namely:

- What are some of the larger similarities and differences that exist between international practice and New Zealand practice, including the role of central agencies?
• What are the key characteristics of environmental education practice in schools/kura kaupapa Māori in New Zealand at this time?

• To what extent do environmental education programmes in New Zealand schools generally follow the planning process identified in the *Guidelines for environmental education in New Zealand schools*?

• What kind of relationships exist between different environmental education services and programmes for schools?

**Critical stocktake methodology**

The critical stocktake was conducted by way of a national survey of schools believed to be involved in environmental education. A database of potential schools for the sample was developed using information from a range of providers of environmental programmes and resources, including the Ministry of Education, local authorities, and environmental sector groups. The final database of 475 schools (17.5 percent of mainstream New Zealand schools) ranged across all school types and school deciles. Three identical copies of the survey were sent to each school: one to a curriculum leader in the school, one to the environmental education leader in the school, and one to a classroom teacher of environmental education. A total of 367 responses were received from 190 schools. Forty-nine schools sent in all three responses and 74 sent in two responses.

Two focus group sessions were held to inform the development of the questionnaire. A focus group of environmental education programme and service providers was held at the New Zealand Council for Educational Research on 20 August 2002. The focus group included representatives from tertiary institutions involved in in-service and pre-service teacher education in environmental education, local and regional government agencies and NGOs involved in environmental education, and an NZEI representative. A second focus group was held at the University of Waikato on 24 August 2002. Participants included teachers from ten primary and secondary schools in the Waikato region.

The view of the focus groups was that teachers’ understanding of environmental education was a key influence on classroom practice and so the survey needed to elicit information on this. It was agreed that teachers should be asked to describe what they meant by the term “environmental education” and to outline their purposes for teaching it. The consensus was that teachers be asked for their own definition of environmental education rather than reacting to a definition provided from the *Guidelines*. In the experience of the focus group members, environmental education was often motivated within a school by an enthusiastic teacher who may or may not have the active support of other teachers or the school administration. Therefore it was proposed that teachers’ backgrounds be explored with respect to the nature of pre-service and in-service training/professional development, teaching experience and current classes taught, and experience teaching environmental education.

The teacher focus group included teachers who had experienced whole school environmental education practice and individuals who had worked in isolation to develop their own classroom environmental education programmes. Both focus groups suggested that the extent of school-wide support for environmental education be explored in the survey. Suggested questions to include were if and how environmental education was incorporated into school policies and practices, and
the nature and extent of support and involvement from the principal, staff, students, and wider community, with particular emphasis on teachers’ access to professional development.

Since a key aim of this research was to explicate current effective practice, the focus groups suggested that the questionnaire explore teachers’ sources of ideas, the extent of child initiation, and direction of environmental education activities, and what contexts, approaches, and activities had been most successful in contributing to the aims of a teacher’s environmental education programme. Additionally they suggested exploring what had contributed to their programme, and how (or if) the unit was linked to the New Zealand Curriculum Framework (Ministry of Education, 1993) and the Guidelines (Ministry of Education, 1999). The teacher focus group recommended that teachers be asked to provide a detailed account of one environmental education unit they had taught.

Both focus groups emphasised that “action for the environment” was a crucial outcome of environmental education. However, it was agreed that determining the nature of student achievements in relation to this outcome was a complex issue and this aspect would need to be explicated within the case studies. Nevertheless, it was recommended that information on teacher practice and student actions “for” the environment be sought. To elicit such information, the focus groups suggested the survey ask teachers to describe achievements and outcomes of their environmental education programmes on several levels, for example achievements for students, achievements for the class/school, and achievements for the community and the environment.

Both groups were interested to know how teachers developed and maintained links with external organisations, and which links and resources they found most useful. A further recommendation was to ask teachers what they perceived as barriers to implementing environmental education and what would help them provide better programmes.

**Structure of the questionnaire**

The questionnaire included a mixture of tick-box and short response questions, and took around 25 minutes to complete. The questionnaire was structured into sections that focused on:

- the respondent’s teaching, school background, and meaning for environmental education (Questions 1 to 9);
- current practice for environmental education at the respondent’s school (Questions 10 to 14);
- the respondent’s own goals and classroom practice for environmental education (Questions 15 to 22);
- links with external agencies or people, support, and resources used by the respondent and additional support required (Questions 23 to 28);
- any further comments.

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3 The notion of student action “for” the environment is discussed further in the literature review (Volume 2).
THE CASE STUDIES

The case studies were designed to complement the other two components of the research through their rich, contextualised descriptions of actual environmental education practice in selected New Zealand schools. The purpose of the case studies was to seek examples of “good practice” in environmental education in a range of New Zealand schools. The case studies sought to investigate the specific characteristics, contexts, and histories of environmental education practice in these schools, and to identify the potential benefits for student learning created as a result of these practices. Importantly, the case studies also allowed the research team to see examples of environmental education practice and to speak to students who had been involved in environmental education. This was the only part of the research to directly access students’ views and perceptions of environmental education, and indicate the impact of involvement in environmental education for these students.

Selection of the schools

The Ministry of Education specified that the case study schools must include at least one primary school, at least one secondary school, at least one school that has participated in the Ministry of Education environmental education professional development programme, at least one kura kaupapa Māori, and at least one school with a high proportion of Māori students in mainstream. We selected case study schools to include a mixture of school types, including rural and urban schools, high- and low-decile schools, small schools and large schools, schools with a high proportion of Māori students, and/or schools with a diverse cultural mix of students. The eight case study schools include:

- two full primary schools;
- one kura kaupapa Māori;
- one intermediate school;
- two composite (area) schools; and
- two secondary schools.

The eight case study schools are geographically spread across five regions: Northland, Waikato, Bay of Plenty, Wellington, and Canterbury. Table 1 shows summary details of the eight case study schools. Some of the schools have been given pseudonyms.
### Table 1

**Characteristics of the case study schools**

<table>
<thead>
<tr>
<th>School</th>
<th>Type</th>
<th>Roll size</th>
<th>Decile</th>
<th>Student ethnicity</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Otari School</td>
<td>Full Primary</td>
<td>147</td>
<td>7</td>
<td>NZ European/Pākehā - 40% Māori - 47%</td>
<td>Suburban</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pacific - 7% Other - 6%</td>
<td></td>
</tr>
<tr>
<td>Snapper Point School</td>
<td>Full Primary</td>
<td>183</td>
<td>6</td>
<td>NZ European/ Pākehā - 64% Māori - 32%</td>
<td>Rural</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pacific - 0% Other - 4%</td>
<td></td>
</tr>
<tr>
<td>Kamo Intermediate</td>
<td>Intermediate</td>
<td>635</td>
<td>5</td>
<td>NZ European/ Pākehā - 66% Māori - 31%</td>
<td>Suburban</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pacific - 0% Other - 2%</td>
<td></td>
</tr>
<tr>
<td>Papatūānuku School</td>
<td>Composite</td>
<td>224</td>
<td>3</td>
<td>NZ European/ Pākehā - 40% Māori - 59%</td>
<td>Rural</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pacific - 0% Other - 1%</td>
<td></td>
</tr>
<tr>
<td>Flaxwater School</td>
<td>Composite</td>
<td>534</td>
<td>3</td>
<td>NZ European/ Pākehā - 45% Māori - 51%</td>
<td>Rural</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pacific - 1% Other - 2%</td>
<td></td>
</tr>
<tr>
<td>Kura kaupapa “A”</td>
<td>Kura kaupapa Māori</td>
<td>102</td>
<td>1</td>
<td>Māori - 100%</td>
<td>Suburban</td>
</tr>
<tr>
<td>Christchurch Girls High</td>
<td>Secondary</td>
<td>994</td>
<td>10</td>
<td>NZ European/ Pākehā - 87% Māori - 4%</td>
<td>Suburban</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pacific - 1% Other - 7%</td>
<td></td>
</tr>
<tr>
<td>Riverview School</td>
<td>Secondary</td>
<td>836</td>
<td>n/a</td>
<td>NZ European/ Pākehā - 87% Māori - 1%</td>
<td>Semi-rural</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Asian - 3% Foreign fee-paying - 9%</td>
<td></td>
</tr>
</tbody>
</table>

* Pseudonym
Case study methodology

The aim of the case studies was to gather sufficient information about the school to provide:

- a description of the school’s environmental education practices, what underpins those practices, and how (and why) environmental education occurs in that school;
- what sort of barriers or challenges teachers or students have encountered as a result of their involvement in environmental education; and
- what teachers and students feel they have gained as a result of their involvement in environmental education.

Our aim was to provide an account of each school’s individual approach to environmental education as well as to draw out common themes and patterns.

A researcher from the New Zealand Council for Educational Research or the University of Waikato spent approximately two to three days in each school collecting data for the case studies. Data was collected from a range of sources. These included:

- school documents (for example, the school’s charter; policy, planning, and curriculum documents; teaching plans; meeting notes; media clippings; and examples of students’ work);
- interviews with key staff who could provide insight into the school’s environmental education;
- in some cases, interviews with other people who are involved in the school’s environmental education (for example, former principals/teachers, regional council staff, school groundspeople, or local environmental education facilitators);
- interviews with students (through informal classroom interviews, or focus group interviews); and
- classroom/school grounds visits (for example, to observe episodes of environmental education practice and/or the results of school environmental education practice in terms of school grounds development or student work).

A digital camera was used in some schools to document examples of environmental education in and around the school. The researchers sent each school a copy of their case study for comment or feedback, prior to its inclusion in the report.
SUMMARY OF FINDINGS FROM THE LITERATURE REVIEW

The literature review (Volume 2) describes the international context for environmental education, and briefly outlines the recent history, current trends, issues, and debates which characterise this field. It gives a historical/contextual overview of the development of environmental education in New Zealand, and describes the development and key features of the Ministry of Education’s environmental education policy document, the Guidelines for environmental education in New Zealand schools. Volume 2 summarises existing literature and research on environmental education practice in New Zealand, and identifies areas where there are significant research gaps.

Volume 2 also highlights examples of international practice in environmental education. These examples provide a context for comparing some of the larger similarities and differences to environmental education policy and practice in New Zealand. The main points covered in the literature review are summarised here.

THE INTERNATIONAL ORIGINS OF ENVIRONMENTAL EDUCATION

To engage with contemporary literature in environmental education, it is important to understand both the history, and the current trends, issues, and debates which characterise this field. The evolution of environmental education during the last 30 years has been shaped to a large extent by a series of global summits and international status reports that reflect changing views about the environment and the role of education in contributing to the resolution of environmental problems. Environmental education began to emerge from global environmental concerns in the 1960s and 1970s. A series of international summits and declarations, primarily driven by UNESCO from the mid-1970s, heralded changing international concerns about the environment. Rather than addressing environmental issues in isolation, the international community began to recognise that a more integrated philosophy of addressing economic and social development alongside environmental issues was needed to promote long-term environmental, economic, and social sustainability.

The development of government policy and curricula in environmental education in most countries was influenced by landmark events including the Tbilisi Declaration (UNESCO, 1978), the Brundtland report (WCED, 1987), and Agenda 21 of the Rio Earth Summit (UNESCO, 1992). The 1977 Tbilisi Declaration gave a framework, principles, and guidelines for environmental education at local, national, and international levels, for all age groups, both inside and outside the formal education sector. The three goals of environmental education adopted by 66 member states at Tbilisi were:

- to foster clear awareness of, and concern about, economic, social, political, and ecological interdependence in urban and rural areas;
- to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment, and skills needed to protect and improve the environment; and
- to create new patterns of behaviour of individuals, groups, and society as a whole towards the environment.
These goals were supported by five educational objectives: awareness, knowledge, attitudes, skills, and participation (see Table 2).

Table 2

<table>
<thead>
<tr>
<th>The five Tbilisi objectives for environmental education</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Awareness:</strong> to help social groups and individuals acquire an awareness and sensitivity to the total environment and its allied problems.</td>
</tr>
<tr>
<td><strong>Knowledge:</strong> to help social groups and individuals gain a variety of experience in, and acquire a basic understanding of, the environment and its associated problems.</td>
</tr>
<tr>
<td><strong>Attitudes:</strong> to help social groups and individuals acquire a set of values and feelings of concern for the environment and the motivation for actively participating in environmental improvement and protection.</td>
</tr>
<tr>
<td><strong>Skills:</strong> to help social groups and individuals acquire the skills for identifying and solving environmental problems.</td>
</tr>
<tr>
<td><strong>Participation:</strong> to provide social groups and individuals with an opportunity to be actively involved at all levels in working toward resolution of environmental problems.</td>
</tr>
</tbody>
</table>

The Tbilisi Declaration referred to the complex interrelationships between human social, cultural, and economic development, and the environment. Although these interrelationships were recognised in the Tbilisi statements, the Declaration suggested that protection and improvement of the environment was the ultimate purpose of environmental education. In other words, education was a means to advance environmental goals.

The Tbilisi Declaration was well-received by many governmental policy-makers, academics, and environmentalists in member states. However, the immediate impact of Tbilisi on policy and practice in the formal education sectors of most countries was generally underwhelming. This signalled an ongoing and persistent tension for the environmental education movement: environmental education was seen as a high scientific, social, and political priority by scientists, environmentalists, and academics, but it was not seen as an educational priority by those responsible for determining policy and curriculum within the formal education sector (Gough, 1997).

The re-orientation of environmental education

While environmental education continued to struggle to secure a place in formal education systems, the attentions of UNESCO and other international drivers of environmental education policy turned during the 1980s and 1990s towards issues of human poverty, economic and social development, and sustainability. In 1980, the *Strategy for World Conservation* was published (IUCN/UNEP/WWF, 1980). This document added to the view that environmental education would need to be reconceptualised to give greater prominence to the social, political, and economic root causes of environmental problems. It was also the first document to give fluency to the term “sustainability” (Tilbury, 1995). Later, the World Commission on Environment and Development’s “Brundtland report” (WCED, 1987) further highlighted the need to integrate
environmental concerns with economic and social development and political contexts. The Brundtland report focused specifically on the needs and interests of humans, asserting that all humans should be able to achieve their basic needs. With appropriate technological and social changes, it was deemed possible to achieve social equity, economic growth, and environmental maintenance simultaneously. The Brundtland report provided a key statement on “sustainable development”, famously defining it as:

…development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Since the Brundtland report, international discourse about the wellbeing of the environment has been inextricably bound to issues of sustainable development.4 Over time, the term “environmental education” has increasingly been supplanted in the international literature by terms like “education for sustainable development” or “education for a sustainable future”.

The 1992 Rio Earth Summit

The most significant landmark in redirecting the international agenda for environmental education was the 1992 Earth Summit (UN conference on Environment and Development) in Rio de Janeiro. Building on the recommendations of the Tbilisi Declaration and the Brundtland report, Agenda 21 of the summit called for the re-orientation of environmental education towards sustainable development. Proposed activities included:

- That governments, in co-operation with all sectors of society, prepare strategies aimed at integrating environment and development as a cross-cutting issue into education at all levels within three years.
- That curricula be thoroughly reviewed to ensure a multidisciplinary approach, with environment and development issues and their socio-cultural and demographic aspects and linkages, with due respect given to community-defined needs and diverse knowledge systems, including science, cultural, and social sensitivities.
- That every school be assisted in designing environmental activity work plans, with the participation of students and staff.
- That governments should affirm the rights of indigenous peoples, by legislation if necessary, to use their experience and understanding of sustainable development to play a part in education and training (UNESCO, 1992).

ENVIRONMENTAL EDUCATION IN THE FORMAL EDUCATION SECTOR

In the 1990s, many governments responded to these international summits and declarations, often after pressure from the environmental education community of interest, by implementing some changes or amendments to environmental and educational policy or curriculum. In some countries, the responsibility for environmental education was taken primarily by ministries of the

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4 It should be noted that “sustainable development” has been criticised as a theoretical concept by some authors (for a summary, see Turner, 1997).
environment, rather than ministries of education, and environmental education policy development focused on integrating environmental education across all community sectors (consistent with the principles of Agenda 21). Whichever branch(es) of government were primarily responsible for environmental education policy development, changes to environmental education policy and curriculum in the 1980s and 1990s seemed to yield modest change, if any, to regular practices within mainstream schooling systems.

Despite the introduction of new policies and curricula to support environmental education, in many countries, environmental education continued to languish at the margins of mainstream schooling, competing with other priorities. Researchers and theorists in environmental education began to examine the reasons why environmental education was not easily integrated into mainstream education, and how schools might deal with the inherent challenges that environmental education raised for conventional approaches to curriculum and pedagogy. To do so, researchers and theorists sought to articulate and define the aims and characteristics of environmental education within a framework of educational theory. A number of authors contributed to a body of literature which articulates the goals and characteristics of environmental education, and their implications for school-based practice. (e.g. see Elliot, 1994, 1995, 1999a, 1999b; Fien, 2000; Fien and Greenall Gough, 1996; Fien and Tilbury, 1996; Gough, 1997; Jensen, Schnack, and Simovska, 2000; Scott, Bruun Jensen, and Pereira, 1998; Scott and Reid, 1998; Tilbury, 1995, 2001a). In particular, these authors have sought to identify the implications of the “re-oriented” environmental education of the 1990s (in the wake of the Rio Earth Summit) for schools.

**Challenges for curriculum and pedagogy in schools**

The re-oriented environmental education certainly poses significant challenges to curriculum and pedagogy in schools. Tilbury (1995) defines the “new” environmental education, environmental education for a sustainable future (EEFS), as being:

- Relevant
- Holistic
- Values-orientated
- Issues-based
- Action-orientated
- Critical education.

The “action-orientated” aspect is perhaps the most widely accepted of these six characteristics. It is often stated that environmental education comprises three dimensions: education in the environment, education about the environment, and education for the environment. The “in-about-for” classification was Lucas' (1979) attempt to categorise the different meanings that had been given to the term “environmental education”. The concept was widely adopted within the environmental education literature, and it is often asserted that genuine environmental education

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5 Although other authors (Ahlberg, 2003) attribute “in-about-for” to an earlier paper on outdoor education (Donaldson and Donaldson, 1958).
only takes place when the real intention is education for the environment (Fien and Greenall Gough, 1996).

Education “for” the environment

Education for the environment denotes an action-oriented approach where students work towards the resolution of environmental questions, issues, and problems (Fien and Greenall Gough, 1996). Fien (1994) locates this kind of environmental education within the critical theory tradition of education. Critical theory directs analysis of environmental problems towards identifying social interests and forces which contribute to, or sustain, the degradation of the environment. Critical theory is “emancipatory” in the sense that it seeks to enable teachers and students to identify and critique the social structures which influence their own and others’ thoughts and actions, so that they might make choices that are not constrained by these influences.

A socially critical approach sees environmental education as having a transformative function. Through socially critical environmental education practice, students and teachers may begin to identify and challenge existing structures which contribute to the creation or perpetuation of environmental problems. Concepts such as “socially critical environmental education” and “action competence” (Jensen and Schnack, 1997), have become part of the accepted theoretical framework in contemporary environmental education literature.

Action competence

The Royal Danish School of Educational Studies has articulated a widely influential concept of the new environmental education in the notion of “action competence”, meaning students’ abilities to act with reference to environmental concerns (Breiting and Mogensen, 1999; Jensen and Schnack, 1997). The action competence approach is underpinned by the view that environmental problems are structurally anchored in society, and therefore have to be understood as community issues with conflicting interests at several levels: individual, social, and structural. Thus, environmental education must help students to identify, expose, and analyse all three levels of conflicting interest, and how they affect the environment, so that they might take actions which address the root causes of environmental issues (Breiting and Mogensen, 1999).

Action competence promotes the idea that the purpose of environmental education is not simply to modify students’ behaviour (Jensen and Schnack, 1997). Behaviour-modification approaches are those which seek to influence the behaviour of students in a previously determined direction, without necessarily allowing students to consciously choose whether or how to make a behavioural change. Jensen and Schnack argue that it is not and cannot be the task of the school to improve the world with the help of pupils’ activities. Instead, environmental education activities must be judged in terms of their educational value, according to educational (rather than purely

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6 Critical theory directs analysis of environmental problems towards identifying social interests and forces which contribute to, or sustain, the degradation of the environment. Through socially critical environmental education practice, students and teachers may begin to identify and challenge existing structures which contribute to the creation or perpetuation of environmental problems (Fien, 1994).
environmental) criteria. The approach is underpinned by a democratic view of education. It is bound to the notion of “participation”:

In a democracy, the members are not spectators, but participants; not equally active participants in everything all the time, naturally, but always potential participants who decide for themselves in what and when they will be involved (Jensen and Schnack, 1997).

In this way, the “action competence” approach emphasises that environmental education must aim to involve students as active participants in all aspects of the environmental education experience. Students must be supported to identify problems, determine solutions, and take action in a way that empowers them to become competent (and willing) participants in future actions that contribute to the solution or avoidance of environmental problems. Wals (1994) emphasises that the learning value of environmental education experiences must be seen in these long-range terms.

...it does not mean that without immediate action the learning process has failed, but it does mean that the learner develops an action-readiness or action-propensity; the ability and willingness to act when the conditions are right (Wals, 1994, p. 138).

Wals and others (Wals, 1994; Wals, Arjen, and Alblas, 1997) have developed a model to support the implementation of “action-taking” environmental education: the action research and community problem-solving (AR&CPS) model. This model involves students, teachers, and environmental educators in a “research triangle” as each group engages in a process of inquiry and reflection, revolving around an issue that is considered to be relevant by members of the school community.

…this means that students investigate a local environmental issue of their own interest (e.g. water quality, school beautification, school violence and safety), teachers investigate ways to improve their own teaching (e.g. working in groups, utilising community resources, conflict management), and outside facilitators who co-ordinate the research triangle, investigate contemporary issues in environmental education research (e.g. students’ perceptions of nature, student empowerment, curriculum design) (Wals, 1994, p.140).

There are many views in the literature as to why practices such as those in the AR&CPS model have generally failed to take root in most environmental education in schools (e.g. see Benedict, 1999; Rauch, 2002; Scott et al., 1998; Scott and Reid, 1998; Sterling, 2001; Tilbury, 2001b). It has been argued that the “transformative” goals and aims of environmental education are irreconcilable with existing “reproductive” structures of schooling (Stevenson, 1987), or at the least, that environmental education challenges deep-seated concepts of knowledge, learning, and the disciplines (Benedict, 1999). By the same token, environmental education has been identified as a potential breeding ground for innovation and educational reform in schools(Elliot, 1999b; Rauch, 2002). The international literature suggests that implementing environmental education in schools often requires significant changes for teachers, learners, and other partners in the school education.

There are different views in the literature about how such changes can be encouraged and supported. Walker (1997) argues that, in the case of environmental education, critical theory is more useful as a way of critiquing practice than changing practice.
Educational researchers have carefully portrayed cases of exemplary environmental education practice, theorised about how practice could be improved, and worked with practitioners to implement environmental education in their schools. The key issue, then, is why has research in environmental education had so little influence on the learning and teaching of environmental education in schools? (Walker, 1997).

Walker contends that critical theory research approaches in environmental education are inadequate as tools for changing teaching practice because they do not take teachers’ own theories about teaching, learning, and curriculum into account, nor do they adequately recognise and accommodate the conditions and constraints of teaching practice. As a result, Walker suggests that socially critical environmental education will only be implemented in schools where there is already a coherence between practitioners’ views and theories about learning and curriculum, the structures and constraints of their school or classroom teaching environment, and socially critical environmental education theory. Where there is no such coherence, Walker predicts that socially critical environmental education will fail to be implemented, because socially critical theory does not provide a mechanism for practitioners to change their theories and practice.

**Local interpretation of environmental education**

A common theme in the contemporary environmental education literature is the notion that all those involved in environmental education should be empowered to participate in discussions, voice their opinions, and reflect on their roles throughout the environmental education process. Many authors believe that environmental education itself must be seen as an evolving process, rather than a fixed goal (Tilbury, 2001a), which requires local interpretation and debate (Sauvé, 2002; Scott et al., 1998). Responsible decision-making in a pluralistic society implies that learners must be capable of interacting with individuals and groups who think or act differently than they do (Lijmbach, Margadant-van Arcken, Van Koppen, and Wals, 2002), and there is a growing focus in environmental education literature on the acceptance and recognition of pluralistic views of both the environment and education. Gough (1997) describes environmental education as not only marginalised within formal education systems, but also an historically marginalising discourse which has been dominated by western cultural conceptions of the environment. Sauvé (2002) asserts that there are many ways that the “environment” can be viewed: for example, the environment as nature, as a problem to be solved, or a resource to be managed, or a system to understand, or a community project, and so on. Different cultural groups also have different ways of relating to the environment. These multiple ways of viewing the environment each hold implications for environmental education.

**Summary of the international context for environmental education in schools**

This brief account of the history, trends, and issues in contemporary environmental education literature illustrates several important points. First, it is clear that views and perspectives about environmental education have continued to change and develop over time. It is also clear that the history of environmental education is strongly tied into wider social, political, environmental, and cultural discourses. Second, environmental education is a field that has developed mostly outside the mainstream education system, and certainly outside the traditional areas of curriculum. Gough
(1997) describes environmental education as one of several forms of “adjectival education” (such as peace education, health education, and social education), that have developed in this way.

Environmental education was originally conceived in the 1960s and 1970s as a tool for solving environmental problems. Along the way, environmental education has had to establish a place for itself within or alongside existing educational frameworks. Theorists have sought to define what environmental education means in educational (as opposed to only environmental) terms, and to understand how environmental education can or should impact on educational policy, curriculum, and practice. Whether or not environmental education is inherently in conflict with conventional structures of schooling (as some have argued), it certainly poses real challenges for policy, curriculum, and practice. Although a large body of literature and research on environmental education has built up over the last few decades, changes in school practice have been much harder to detect. The question of how environmental education can effectively become an authentic part of schooling raises further questions about what kind of changes are required within schools, and how change processes can be promoted and supported. There is a growing tendency in the environmental education literature to move away from seeking universal answers to these questions. Much contemporary literature leans towards the view that environmental education can not be effectively implemented in schools without discussion among all those who have a stake in local environmental education, including those who are to participate as teachers and learners, about the goals, purposes, and meaning of environmental education for local contexts.

**THE NEW ZEALAND CONTEXT FOR ENVIRONMENTAL EDUCATION IN SCHOOLS**

International summits and declarations, as well as New Zealand’s own environmental management policies and obligations to the Treaty of Waitangi, have influenced environmental education policy developments in New Zealand. Grass-roots support for environmental education has also been strong. Prior to the introduction of the *New Zealand Curriculum Framework*, several initiatives and conferences, facilitated by environmental education communities of interest, aimed to promote environmental education in New Zealand schools. Environmental education continued to lack a formal place in the curriculum when the *New Zealand Curriculum Framework* was introduced in 1993. However, the Framework acknowledged that schools could adapt their curriculum to take account of local needs, priorities, and resources, and that the curriculum must help students to be adaptable and play their full part in a changing environment, with reference to environmental and other concerns.

The release of the *Guidelines for environmental education in New Zealand schools* in 1999 gave direction for schools interested in integrating environmental education into their curriculum. The Guidelines reflect the influences on New Zealand’s environmental education policy development described above, with, for example:

- its focus on environmental education being “in” and “about” the environment, as well as “for” the environment;
- its specific emphasis on interdependence, sustainability, biodiversity, and personal and social responsibility for action; and
- the significance given to Māori knowledge and the Treaty of Waitangi.

The Guidelines also reflect the structure of the *New Zealand Curriculum Framework*, with strong emphasis placed on linking environmental education to the mandated learning areas, and the

**Previous New Zealand research on environmental education in schools**

Our searches of the literature found that current New Zealand research on environmental education in schools is scarce, although graduate and post-graduate studies are increasing. The existing field of New Zealand environmental education research includes studies of environmental education in schools, and studies that have focused on environmental education involving community agencies, local and regional government, and other groups working outside or alongside the school sector.

The literature review found some notable gaps in the existing knowledge base about environmental education practice in New Zealand schools. New Zealand studies relating to environmental education in schools have investigated themes such as: teachers’ views of environmental education; personal characteristics/attributes of teachers committed to environmental education; curriculum areas in which environmental education is taught; and identifying problems or barriers for the implementation of environmental education in New Zealand schools (Bravo, 2001; Buchanan, 1996; Chidlow, 1997; Chronis, 2001; Hodgetts, 2000; McConnell, 1998; van Rossem, 1995; Vowless, 2002). Several surveys sought to identify characteristics of environmental education practice in New Zealand schools. However, none of these studies gives a clear overall picture of the current status of environmental education in New Zealand schools, nor details about specific environmental education practices or their subsequent impacts or effects for students.

A few recent studies have begun to document environmental education teaching and learning practice (and the development of such practice) in New Zealand schools (Chapman, 2000; Keown, McGee, and Carstensen, 1995; Keown, McGee, and Carstensen, 1999; Mardon and Ritchie, 2002; McLean, 2002). However, New Zealand research on learners and learning in environmental education appears mainly to comprise studies of learners’ knowledge, awareness or understanding *about* the environment or environmental issues, or students learning *in* the environment. There appears to be a lack of research that directly investigates the perceptions or learning outcomes of students engaged in education “for” the environment. Overall, the review found a lack of comprehensive research on the processes or outcomes of regular school-based environmental education practice(s) for students within New Zealand schools.

**Characteristics of environmental education in New Zealand schools derived from the literature**

Six general characteristics of environmental education in New Zealand schools seemed to be supported by the available literature. These six characteristics are as follows:
Characteristic 1: An emphasis on creating and exploiting links between programmes in schools, and extra-school agencies (e.g., regional authorities, conservation and environment societies, and other interest groups).

Characteristic 2: The endorsement of “whole school” approaches to environmental education.

Characteristic 3: The advocated inclusion of Māori knowledge and values in environmental education.

Characteristic 4: In practice, a tradition of education “in” the natural (and local) environment—e.g., through school camps, biology field trips, and learning experiences outside the classroom.

Characteristic 5: The frequent selection of certain areas of content “about” the environment in school environmental education programmes, and an abundance of resource materials to support these (for example, biodiversity, local flora/fauna, nature conservation, water, air, waste and recycling, tree-planting and bush studies, and various aspects of gardening).

Characteristic 6: A central focus on the relationship between environmental education development, and the content of curriculum statements in the seven learning areas of the curriculum framework.

Characteristics 1–3 are primarily features of environmental education policy, articulated in documents such as the Guidelines, and also through supporting documents and resources such as Enviroschools, the Eco-school, and the two Ministry-funded environmental education professional development programmes. However, there is currently little research to indicate how these characteristics translate, if indeed they do, into curriculum and practice in New Zealand schools. By contrast, characteristics 4 and 5 are primarily features of environmental education practice in New Zealand schools, supported by existing research evidence. Characteristic 6 is primarily a feature of environmental education curriculum in New Zealand, which advocates its integration with the essential learning areas. However, we found little research that examined how this plays out in practice in New Zealand schools.

**Significant research gaps**

The literature review highlighted several areas where little or no New Zealand research was found. These included areas of “mainstream” environmental education practice, such as:

- the impact of teacher pre-service and in-service environmental education on teachers’ subsequent teaching practice, and on environmental education practice in the schools in which they teach;
- the impact or outcomes for students of participation in special environmental education programmes offered to New Zealand schools or to students outside the regular school programmes, and their relationship to regular school teaching programmes;
- the impact of the involvement of external agencies or people on New Zealand schools’ own environmental education programmes, and the actual outcomes or effects of this for teachers and students; and
• the long-term impact or effects of environmental education provision for New Zealand students within regular school programmes.

A large research gap was also found regarding environmental education in relation to Māori knowledge and values, and in relation to Māori students.

**DIRECTIONS FROM THE INTERNATIONAL LITERATURE**

The literature review highlighted some examples of international practice in environmental education, which were useful for comparing some of the major similarities and differences in environmental education policies, practices, and research in New Zealand.

Environmental education has often faced issues of marginalisation in formal education systems. At the same time, international events like *Agenda 21* have exerted strong pressure on governments to develop environmental education policies and curricula, often with slow results. Consequently, the environmental education community has relied heavily on national and international networking as a means of sharing ideas and strategies to further the implementation of environmental education in schools, and for leverage to promote governmental policy developments in environmental education. The literature review described two major cross-national networks of activity involving environmental education in schools: the Environment and Schools Initiative (ENSI); and the Asia-Pacific networks anchored by UNESCO-ACEID and Griffith University.

**ENSI**

Environmental and School Initiatives (ENSI), is a decentralised international network initiated in 1986 by OECD/CERI. Ensi’s aim is to:

…support educational developments that promote environmental understanding, active approaches to teaching and learning, and citizenship education, through research and the exchange of experiences internationally (Elliot, 1999a, p.1).

ENSI involves voluntary co-operation of mostly European member countries. It has no official legal status, and cannot pass legally binding resolutions. Governments of member countries pay annual contributions to fund the ENSI work programme, but the practical realisation of focus projects is organised and funded by the national education authorities of member countries. Each member country has a national co-ordinator, who is responsible for keeping contact between their government and ENSI, and for organising the national ENSI activities along the ENSI work programme (OECD/CERI, 2001).

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7 Organisation for Economic Co-operation and Development, Center for Educational Research and Innovation.
Asia-Pacific environmental education networks

Several significant initiatives in environmental education originated in the Asia-Pacific region. Two particularly significant environmental education initiatives across the region during the last decade have been:

- an initiative focused on strengthening teacher environmental education; and
- a research project investigating young people’s views of the environment and environmental issues.

New Zealand researchers and educators have participated in both of the Asia-Pacific projects, but New Zealand has not been part of the ENSI initiative.

Lessons from the ENSI and Asia-Pacific environmental education networks

Both the ENSI and Asia-Pacific networks have generated a large amount of literature about environmental education policy, curriculum, and practice in a range of European and Asia-Pacific countries. These include: action-research reports and case studies written by teachers or teacher educators; university-based studies and evaluations; national country reports on the policy status of environmental education; and international conference and workshop reports that synthesise national country reports and provide a global perspective on the progression of environmental education across countries.

A synthesis of this information indicates some of the factors which have helped and hindered the implementation of environmental education in schools, across different nations, over time, with a particular focus on strategies aimed at moving environmental education from the periphery of the school system and into mainstream practice.8

The ENSI and Asia-Pacific networks suggested that the development of environmental education in schools is a demanding process that requires complex strategies for change. Strategies that these networks used to support the development of environmental education in schools included:

- international co-operation and sharing of ideas and strategies;
- a priority on linking environmental education resource development with teacher professional development;
- a transition of focus from individual school-based initiatives, towards more centralised support for environmental education; and
- a culture of action-research.

These strategies appeared to support environmental education development through an emphasis on supporting practitioners’ learning and professionalism, engaging practitioners in dialogue about the goals, aims, and purposes of environmental education, and by embedding continuous research and evaluation as a central facet of environmental education development.

8 For full details about ENSI and the Asia-Pacific environmental education networks, see Chapter Six, Volume 2.
Environmental education profiled in six countries

The literature review (see Chapter Seven, Volume 2) describes examples of environmental education policy, practice(s), and research from six countries: the Netherlands, Norway, Austria, Australia, England, and the United States. Each country profile was assembled to describe environmental education practice at the national/systemic level (in particular, the role of central government and official environmental education policy); at the school organisation level, and where possible, at the pedagogical level. The following is a brief summary of five of the country profiles.

The Netherlands

The Netherlands country profile suggested that quality enhancement of environmental education requires a co-ordinated approach across government and society. Since 1986, there has been a co-ordination of environmental policies in the Netherlands across several government ministries, including the Ministries of Environment, Education, and Agriculture. Three successive waves of initiatives have been launched by the ministries:

- **1986–1992**: Development and national piloting of a cross-disciplinary core curriculum for environmental education, “Teaching for sustainable development”. National attainment targets and textbooks were re-written and school environmental education co-ordinators were trained.

- **1992–1995**: A broad implementation campaign was undertaken in which dozens of NGOs were paid to design and produce materials for schools. Evaluations of this activity found that most primary and 25 percent of secondary schools claimed to integrate environmental education into their daily practice. However, there was evidence that there were wide differences in perception of the meaning of “environmental education” as a concept, and what this meant in practice.

- **1996**: Establishment of an initiative which had three aims: 1) to improve the quality of environmental education activities, rather than focusing on sheer quantity of environmental education projects; 2) to broaden the scope of environmental education across society; and 3) to enhance the professionalism of environmental education organisations.

The most important aspect of the last initiative was a shift in the methodology that policy interventions employed to effect change. Rather than focusing on achieving pre-set quantifiable targets (for example, as in the first two waves of initiatives), the third wave of initiatives aimed to create structures to support development of quality processes, dialogue, and education. In the Netherlands, this was said to have led to a “process model” rather than an “implementation model” of environmental education development. The process-based approach, which focuses on enhancing the professionalism of those contributing to environmental education, appeared to produce some innovative approaches that could have positive spin-offs for schools, when schools were themselves involved in the “process”. For example, one innovative project, the “school profiling” approach, was developed as an exercise to enhance the professional development of teacher educators and pre-service teachers. The “school profiling” process required schools to ask themselves a series of questions about what they felt was important for students to learn, and then to make changes to curriculum and structures within the school accordingly. These questions were:
• What ideal image do we have of the pupil leaving school after eight years?
• In what ways does the culture of the school promote the pupil’s education?
• How is the characterisation of the school recognisable from the layout of the school and its surroundings?
• What are the main points of the school curriculum which characterise the choice that has been made?
• Which out-of-school contacts do we need to realise the type of education we desire?
• Which particular qualities does the characterisation require from individual teachers?

In the Netherlands project, the teacher educators drafted school profiles, and enlisted student teachers and primary schools to design and implement a “learning landscape” within a school which would fit with the school’s “profile”. Schuurmans (1999) describes some positive outcomes for teacher educators and student teachers who participated in this initiative. Student teachers appeared to have become confident and competent designers of good education, often exceeding the expectations of their lecturers. The impact on the schools is less clear; however, it should be noted that the purpose of the project seems to have been to develop the professional capability of teacher educators and student teachers, and to develop and trial the “school profiling” process itself. The next planned step in this pilot initiative was to infuse the idea of school profiling into the education of school principals.

Norway

The Norway country profile showed evidence of strong central leadership and a co-ordinated plan for environmental education development in schools. Steps taken to support this included the introduction of compulsory environmental education for pre-service teachers, revisions to the national curriculum, and a mandatory in-service development programme for teachers. The Norwegian education ministry has taken a strong leadership role in the support and institutionalisation of environmental education into mainstream schooling, and hosted a 1999 ENSI conference on this issue (Ministry of Education Research and Church Affairs (Norway), 1999). Norway has also assumed a large role in the Nordic MUVIN project (MUVIN is a Norwegian acronym for Environmental Education in the Nordic Countries).

As was the case for most European environmental education initiatives, by the early 1990s, there was still little in the way of evaluative research on the processes and qualities of environmental education in Norwegian schools. In 1992, Norwegian researchers associated with the MUVIN project embarked on a longitudinal study that aimed to give “a realistic description of environmental education” in the primary schools of two regions in Norway (Christensen and Kristensen, 1996, p. 6). The study was intended to assist with the evaluation of the national in-service teacher education programme, which would be implemented from 1994 onwards, by providing some baseline information with which to compare any subsequent changes stemming from the national programme. Baseline data was collected on environmental education in primary schools in two regions in 1993/1994, prior to the introduction of the mandatory in-service teacher education programme. Data from headmasters, teachers, and students suggested that many teachers lacked proficiency in environmental education. For example, only about 10 percent of those surveyed had attended the compulsory 40-hour courses. Topics most often covered in environmental education included “appreciation of nature”, “pollution”, and “ethics and values”.

Environmental education in New Zealand schools

Volume 1: Summary of the research
Low priority was given to topics such as regional planning, environmental legislation, the cultural environment, environmental conflicts, and economics. Schools also reported infrequent co-operation with outside groups or agencies. Schools tended to put emphasis on practical work in environmental education. However, two-thirds of teachers reported seldom or never using project work in their general teaching, and several schools had project-based teaching that did not involve student decision-making or problem-solving.

In 1995/1996, 34 schools were approached to undertake at least one project related to the theme of “conflicting interests in the use of natural resources” (Endresen, 1996). The process of project-oriented education was thought to be a new phenomenon for many Norwegian schools. In recognition of this, an external consultant was attached to each school to help them plan and carry out the projects.

An important element of the MUVIN projects is that they should not simply be a one-off event in the life of a school. The idea is that the experiences gained through MUVIN should lead to a changed educational practice throughout the school. The school administration is a central part of the effort. It must make sure that time is set aside for discussions with personnel, that the project is evaluated and that any new practices are published in the school's planning documents (Endresen, 1996).

Unfortunately, follow-up evaluations of these initiatives are currently only published in Norwegian and were not accessible for this review (Terje Kristensen, personal communication, October 2002).

Austria

The underpinning view of environmental education in Austria, as it is manifested through official Austrian governmental policies and programmes to support and promote environmental education, is one of “socio-ecological environmental education” (Rauch, 2002). That is, rather than seeking to train students to perform environmentally sound behaviour, learners should be able to develop an understanding that environmental issues are structurally anchored in society, and therefore have to be understood as community issues with conflicting interests at several levels: individual, social, and structural.

Austria has been notable in its support and involvement in ENSI, and the Austrian “ecologisation of schools” (ECOLOG) project is one of the most written-about ENSI projects. The pilot phase of the project began in 1996 (phase 3 of ENSI) with 22 Austrian schools. The “ecologisation of schools” initiative was a whole school environmental education approach associated with teacher action-research. At the beginning of the project, the Austrian government commissioned a literature review of models and experiences gained from other whole school approaches to environmental education but could find little published information. Therefore, information about whole school approaches was solicited directly from schools, teachers, experts, and other

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9 In fact, the ENSI initiative was launched in response to a proposal put forward by the Austrian Minister of Education in 1984 that environmental education be a priority in future educational development (OECD/CERI, 1995).
organisations in a variety of European countries. This information was synthesised to distil some key features purported to define and support the ecologisation of schools (Table 3).

Table 3

Features of the ecologisation of schools

(Rauch, 2000, p. 253)

<table>
<thead>
<tr>
<th>Features of the ecologisation of schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecologisation is understood as a comprehensive project and is integrated in the material household management of the school, with goals and values, as part of teaching and learning at school.</td>
</tr>
<tr>
<td>Action-orientated and reflective forms of teaching are developed and applied, where pupils learn actively (e.g., by generating local knowledge) and take over responsibility for shaping things or processes.</td>
</tr>
<tr>
<td>Ecologisation is organisational development that is characterised by the following: communication, co-operation and teamwork (including a conflict management culture) of all players (head teacher, teachers, pupils, non-teaching staff, external persons), as well as joint assignment of decision-making powers and responsibilities. Schools see themselves as learning organisations.</td>
</tr>
<tr>
<td>The development process is subject to continuing on-site evaluation (quality development).</td>
</tr>
<tr>
<td>Initiatives are supported. The main elements of a supporting structure are material and non-material incentives, a supportive and encouraging head teacher and school administration, external experts, who may be consulted in case of need, internal counselling teachers or co-ordinators, and the chance to exchange experiences with teachers and schools at regional, national and international levels.</td>
</tr>
<tr>
<td>The development of a constructive relationship with the local community or neighbourhood (opening-up of the school to the outside world), with the school as a place of teaching and learning for the local community.</td>
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</tbody>
</table>

The “ecologisation of schools” is deemed to require both pedagogical changes and school organisation changes in order to achieve “sociological” as well as “ecological” outcomes. However, analyses of teachers’ action-research reports from this initiative suggests that many of the school initiatives focused primarily on “ecological goals”, interpreted in a narrow sense as the cost-efficient use of physical resources. This was at the expense of broader “socio-ecological goals” of environmental education, related to the development of students’ critical thinking skills, identification of the root causes of environmental problems, and willingness to take responsibility for actions towards solving these problems. For example, two primary teachers’ action-research case studies of their schools’ involvement in the ECOLOG project (Breidler, 1999; Eder, 1999) provide narrative accounts of the social/organisational level changes that occurred within their schools over two years. The teachers describe increased teamwork between teachers, more positive relationships between pupils, teachers, and the school caretaker, and more constructive working relationships between the school community, parents, and the local community. A weakness of these two case studies is that there is no direct or critical evaluation of how the school’s “ecologisation” process translated into environmental education learning opportunities or outcomes for students. In both teachers’ case studies, it is unclear to what degree students were engaged in decision-making processes in their school.
Australia: New South Wales

Environmental education in New South Wales features an interagency policy which explicitly co-ordinates the school-based and non-school-based components of environmental education. The state is unique in having a mandatory requirement for an integrated environmental education policy in schools, the School Environmental Management Policy (SEMP).

Another recent initiative of the NSW Department of Education and Training (DET) is to support the development of “learnscape”s in selected New South Wales schools. Learnscape is a school grounds feature, for example, an edible garden, or a wildlife corridor, where a learning programme has been designed to permit users to interact with the environment. In 1998, The School Learnscape Trust was established in New South Wales to promote and develop the concept of learnscape and implement pilot projects. The trust, in association with the Environmental Education Unit of the NSW DET, provided support to 20 schools identified by the department to receive support during 1998 and 1999 (School Learnscape Trust, 2000). Learnscape are intended to be more than just features of the school grounds. Rather, the perceived value of the learnscape lies in the planning, development, and maintenance process. In principle, the learnscape:

...is a means of implementing environmental education across the curriculum and a step to deeper co-operation between schools and their communities to fulfil the concepts of the regional ecological sustainable development (ENSI, 2002).

NSW DET curriculum and policy statements indicate that learnscape s are a way of strengthening environmental education in schools. However, one early evaluation suggests that the success of the “learnscape” initiative is contingent on teachers viewing learnscape development as a “process” which provides opportunities for student learning in environmental education, rather than simply a “feature” in the school grounds. Skamp and Bergmann (2001) interviewed six teachers at a primary school and 20 teachers at a secondary school in New South Wales, to investigate teachers’ perceptions of the value and impact of learnscape s in their schools, and the extent to which teachers used the learnscapes. Both schools were in the early stages of a learnscapes project. At the time of the study, learnscapes were not documented in either of the school’s key learning area policies or programmes, and only three teachers referred to them in their written teaching plans. In general, teachers in the two schools were not aware of the state-level or school-level environmental education documentation.

While the majority of teachers were strongly supportive of the learnscapes projects in their school, Skamp and Bergmann found most teachers were not using the learnscapes regularly. Although most teachers associated the learnscapes with student learning, they made only occasional and oblique references to “environmental education” in reference to the learnscapes. Student involvement in learnscape development involved either membership in a small, school-wide learnescape-planning group (for a few students), or participation in surveys seeking preferences for school ground changes (for most students). Teachers thought that involvement in the planning group had helped students learn co-operative skills, how to become unified as a group, use lateral thinking, and consider practicalities in planning. However, most teachers did not relate learnscapes process actions to the action strategies for environmental education as described in the state’s environmental education curriculum documents. That is, students’ “acting locally” in the development and use of the learnscapes was not consciously linked to “thinking globally” about
larger environmental and sustainability issues, nor how students might apply the knowledge and skills gained through the project to future environmental action or problem-solving.

England

Although high-level government policy in England appears to be moving towards strategies for sustainable development, environmental education is not mandatory for schools in England and there appears to have been little uptake of environmental education practice in most English schools. When the National Curriculum was introduced in England and Wales in 1990, environmental education was identified as one of five cross-curricular themes. However, the sheer volume of change that schools underwent to implement the new National Curriculum quickly led to a marginalisation of all the non-statutory, cross-curricular themes, as schools prioritised their activities based on the new assessment and accountability requirements (Scott and Reid, 1998). Some of these demands were reduced when implementation of the National Curriculum was formally reviewed in 1994, leading to a reduction in the content and time-allocation requirements of the statutory curriculum on schools.

The next few years saw a flurry of governmental policy activity relating to environmental education. In 1996, the Schools Curriculum and Assessment Authority (SCAA) published a government document for teaching environmental education within national curriculum subjects: Teaching Environmental Matters through the National Curriculum. In 1996 the Council for Environmental Education (CEE), an NGO, produced a document Our world – our responsibility: environmental education, a practical guide (RSBP/CEE, 1996). This document was intended to give schools guidance on how to develop a whole school environmental education policy, and was written with the approval of DfEE to coincide with and complement Teaching Environmental Matters through the National Curriculum (Gayford, 2000).

Non-governmental organisations have been important in the support of environmental education in UK schools. However, as a varied group of organisations with a range of specific environmental issues, the UK has faced challenges co-ordinating the interactions of NGOs with schools.

Scott and Reid (1998) assert that attempts by central and local government and other environmental organisations to stimulate and steer environmental education in English and Welsh schools for the past 25 years have achieved only isolated pockets of success. Scott and Reid suggest the government’s environmental education policies are unlikely to be effective unless schools are provided with better advice and support. They argue that documents like Teaching Environmental Matters through the National Curriculum (SCAA, 1996) and Our world – our responsibility (RSBP/CEE, 1996) fail to help schools identify how environmental education policies might be established, developed, and achieved. In particular, they give inadequate guidance for schools in terms of: visioning – how do you (the school community) set about determining what your environmental education goals should be?; implementation – having established your goals, how might you set about achieving them?; and holism – how do you educate others in a way that increases your own understanding and wisdom? Unless these areas are addressed, Scott and Reid doubt that the government’s espoused environmental education policies can become policies that schools can use.
SUMMARY OF FINDINGS FROM THE CRITICAL STOCKTAKE

The critical stocktake (Volume 3) reports findings from an analysis of 367 survey responses from 193 schools in environmental education. The critical stocktake provides data on the characteristics of school-level and classroom-level environmental education practice in these schools, and outlines the views and perceptions about the meanings, purposes, and achievements/outcomes of their environmental education programmes. The main points covered in the critical stocktake report are summarised here.

CHARACTERISTICS OF SCHOOLS AND TEACHERS WHO RESPONDED TO THE SURVEY

Schools involved in environmental education

The surveys were sent to a non-random sample of 475 schools believed to be involved in environmental education. Three copies of the survey were sent to each school: one to a curriculum leader in the school, one to the environmental education leader in the school, and one to a classroom teacher of environmental education. A total of 367 responses were received from 190 schools. Fifty-one schools sent in three responses and 70 sent in two responses. Eight face-to-face interviews were conducted in lieu of a postal survey in three kura kaupapa Māori.

Characteristics of survey respondents

As might be expected from a purposive sample of schools with some involvement in environmental education, the majority of the 367 survey respondents reported a high level of involvement in and enthusiasm for environmental education. The respondents were a very experienced group with 59 percent having more than 15 years teaching experience. Despite this, almost 75 percent of respondents reported they had been involved in environmental education for less than five years. Nearly forty-five percent reported that they had been involved for less than two years, suggesting there may be an association between their involvement in environmental education and the publication of the Guidelines for environmental education in New Zealand schools (Ministry of Education, 1999), and/or participation in professional development in support of the Guidelines. Nearly 20 percent of respondents reported they had been involved in environmental education for as long as they had been teaching; for 42 respondents this was for over 15 years.

It is important to remember that the survey did not provide a definition of “environmental education”, and so respondents had to decide for themselves whether or not they were doing environmental education. There was some indication that respondents may have been participating in environmental studies and actions for the environment without labelling them as environmental education. For instance, discussions with the five schools that queried the basis for their inclusion in the stocktake revealed they were engaged in activities such as recycling and gardening. In addition, one survey respondent explained:
I feel that although I have not been following the *Guidelines* I have still been covering aspects of environmental education in the various topics I cover under social studies, technology and science. We look at impact of man on the Amazon River and mangroves, recycling, and waste etc. (Full primary – curriculum leader)

**Teacher involvement in environmental education professional development**

Over half of the respondents had had training in environmental education with most reporting having in-service training. Responses highlighted a range of training sources, including *Guidelines* professional development, other Ministry of Education programmes, and programmes delivered by local authorities, botanic gardens, and a range of community groups. Very few reported pre-service training.

**Table 4**

*Summary of respondents’ environmental education training*

<table>
<thead>
<tr>
<th>Type of training</th>
<th>% of respondents (n=367)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No training</td>
<td>48</td>
</tr>
<tr>
<td>In-service only</td>
<td>44</td>
</tr>
<tr>
<td>Pre-service only</td>
<td>6</td>
</tr>
<tr>
<td>In-service and pre-service</td>
<td>2</td>
</tr>
</tbody>
</table>
Table 5

*Type of in-service training reported*

<table>
<thead>
<tr>
<th>Type of training</th>
<th>% of respondents who described their training (n=169)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Education environmental education professional development</td>
<td>39</td>
</tr>
<tr>
<td>Regional and city councils</td>
<td>15</td>
</tr>
<tr>
<td>Enviroschools</td>
<td>9</td>
</tr>
<tr>
<td>Tertiary qualification in environmental education</td>
<td>7</td>
</tr>
<tr>
<td>Outdoor education programme</td>
<td>6</td>
</tr>
<tr>
<td>GLOBE</td>
<td>4</td>
</tr>
<tr>
<td>Botanic Gardens</td>
<td>4</td>
</tr>
<tr>
<td>Sustainable Organic School Gardens</td>
<td>2</td>
</tr>
<tr>
<td>Other providers</td>
<td>18</td>
</tr>
</tbody>
</table>

**Enthusiasm for environmental education**

Respondents’ descriptions of student, school, community, and their own achievements indicated that many respondents gained a great deal of satisfaction from their involvement in environmental education. This may be an attribute of the sample but nevertheless, respondents indicated they experienced a sense of satisfaction from seeing their students enjoying learning about, and taking action for, the environment. Another source of satisfaction was their belief that the changes engendered in student attitudes would have a positive impact on the environment in the long term. Respondents valued their greater involvement and interaction with parents and the local community and appreciated the kudos that flowed from this. They felt that student and school action for the environment had tangible benefits for the community. For example:

Environmental Education in our school has ‘grown’ very fast and permeates through a whole range of areas. It supports our values programme and is integrated into the programme. We give it ‘high priority’ for community information getting parents and wider community on side. Next year, zero waste and global monitoring is our focus. Excellent! (Full primary – principal)

As a school principal I feel that this new initiative in our school is without doubt one of the more exciting developments for some time. The capacity of environmental education to enable adolescent (low decile) kids to engage in hands on learning is wonderful. Our early involvement has also brought about
Meanings and purposes attached to the term “environmental education”

The survey asked respondents to describe how they understood the term “environmental education”, and their own purposes for teaching it. Comments were analysed in terms of the five aims, three dimensions, and four key concepts of environmental education outlined in the *Guidelines for environmental education in New Zealand schools* (Ministry of Education, 1999).

Table 6

<table>
<thead>
<tr>
<th>Five Aims</th>
<th>Four Key Concepts</th>
<th>Three Key Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aim 1: students to develop awareness and sensitivity to the environment and related issues.</td>
<td>Interdependence</td>
<td>Education in the environment</td>
</tr>
<tr>
<td>Aim 2: students to develop knowledge and understanding of the environment and the impact of people on it.</td>
<td>Sustainability</td>
<td>Education about the environment</td>
</tr>
<tr>
<td>Aim 3: students to develop attitudes and values that reflect feelings of concern for the environment.</td>
<td>Biodiversity</td>
<td>Education for the environment</td>
</tr>
<tr>
<td>Aim 4: students to develop skills involved in identifying, investigating, and problem solving associated with environmental issues.</td>
<td>Personal and social responsibility for action</td>
<td></td>
</tr>
<tr>
<td>Aim 5: students to develop a sense of responsibility through participation and action as individuals, or members of groups, whānau, or iwi, in addressing environmental issues.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Responses were dominated by a concern with “education about the environment” (Aims 1 and 2). In terms of respondents’ meanings and purposes:

- over two-thirds of the mainstream respondents mentioned the development of student knowledge, understanding, and awareness of the environment and environmental issues (Aims 1 and 2);
- one-third of respondents described the development of student values and attitudes towards the environment (Aim 3);
- around 20 percent listed student actions for the environment in their definition of environmental education. Thirty-three percent mentioned student action when explaining their purposes for teaching environmental education (Aim 5);
- a concern with interdependence and personal and social responsibility was evident in a third of responses;

more connecting with our wider community than any other curriculum area. Very enthusiastic about our involvement. (Intermediate/decile 2 – principal)
just over a fifth of the responses specifically mentioned the concept of sustainability and/or a concern with the future; and

- biodiversity was mentioned by less than one percent of respondents.

The *Guidelines* indicate that a balanced environmental education programme needs to include the three dimensions of “in”, “for”, and “about” the environment. Less than 20 percent of those who described what the term environmental education meant to them, and why they taught environmental education, described all three dimensions. This raises questions about how the respondents view the interaction of the three dimensions.

Interestingly, the four key concepts figured more prominently in responses from the kura kaupapa Māori respondents. They emphasised their personal and familial involvement with the environment more than respondents in the mainstream schools and considered the four key concepts to be in line with Māori worldviews and with the principles underpinning *Te Aho Mātua* (Mataira, 1997). It needs to be remembered, however, that data from kura kaupapa Māori participants was generated via face-to-face interviews, most lasting for over an hour.

**CHARACTERISTICS OF ENVIRONMENTAL EDUCATION PRACTICE IN NEW ZEALAND SCHOOLS AND KURA KAUPAPA MĀORI**

The literature review and focus groups indicated that the implementation of environmental education is often constrained by the current structure of schools. Therefore, information on environmental education practice was sought at two levels – school systems and classroom practice. This section sets out the key findings on each of these levels.

**At the level of school systems**

**Inclusion in school policy and planning documents**

Where environmental education is included in school documents, this tends to be through departmental curriculum plans (64 percent) or school strategic plans (36 percent) and to a lesser extent in school charters or Board of Trustee policies (around 25 percent of responses). Environmental education did not feature significantly in either student reporting or teacher appraisal.
Table 7

Inclusion of environmental education in school policy, curriculum, and assessment documents

<table>
<thead>
<tr>
<th>Type of documentation</th>
<th>Yes (%)</th>
<th>No (%)</th>
<th>Not sure (%)</th>
<th>No response (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>School charter</td>
<td>23</td>
<td>32</td>
<td>30</td>
<td>15</td>
</tr>
<tr>
<td>Board of Trustees policy</td>
<td>26</td>
<td>28</td>
<td>32</td>
<td>14</td>
</tr>
<tr>
<td>School strategic plan</td>
<td>36</td>
<td>24</td>
<td>28</td>
<td>12</td>
</tr>
<tr>
<td>Departmental plan</td>
<td>64</td>
<td>15</td>
<td>13</td>
<td>8</td>
</tr>
<tr>
<td>Teacher appraisal</td>
<td>17</td>
<td>54</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>Student reporting</td>
<td>26</td>
<td>42</td>
<td>12</td>
<td>20</td>
</tr>
</tbody>
</table>

Lack of inclusion at the systems level was of concern to some respondents who proposed that school-wide policies and planning in support of environmental education would help them teach a better programme.

We’re really only starting with environmental education. Our big problem was that we had lots of ideas and we’re already doing ‘bits and pieces’ but nothing was cyclic or cohesive. We’re trying now to fit it into our cross curricula plans as school-wide topics that obviously incorporate our long-term plans. Also we need a long-term environmental plan/policy etc. (Full primary – curriculum leader)

Sustainability of environmental education

As has been pointed out, environmental education is relatively new within most schools although it would appear a few of the sample schools have sustained an involvement in environmental projects over a number of years. Units described as ongoing for some years involved recycling, worm farming/composting, gardening, and planting.

Faxed responses from five schools stating they would not take part because the person involved in environmental education had left the school suggests that when environmental education is promoted by an enthusiastic individual, its long-term viability is not assured.

Most respondents (58 percent) reported environmental education is taught throughout the year with timetabling largely left up to teacher choice, suggesting that environmental education was not part of formal and/or collegial planning in most schools. Some respondents considered that environmental education needs to be incorporated into school policies and planning to be viable.

Planning is crucial to long-term success and time is needed for excellent careful planning & integration of environmental education. (Full primary – curriculum leader)
Currently it is reliant on an already busy teacher doing extra work to lead the programme in our school. If it is to be sustainable, time needs to be given to development and funding needs to reflect that!! (Full primary – principal)

Whole school approaches

The Guidelines support the development of whole school approaches to environmental education, and whole school approaches are widely advocated in the international literature in environmental education. Interestingly, only 12 percent of the environmental education units described by survey respondents (n=30) included a whole school approach, usually in conjunction with Board of Trustees and principal support, although this was more evident in primary than in secondary schools.

There was evidence that participants endorsed a “whole school” approach to environmental education. Whole staff professional development, including the development of greater understanding of environmental education by the principal and/or Board of Trustees, was seen as a way of increasing “ownership” and involvement by the whole staff (n=30).

This is on the fringe of curriculum. Trying to get a school-wide unit off the ground requires lots of work and commitment by all staff. Unless a strong leadership decision is made, or there is a curriculum requirement, unity here is hard to attain. (Contributing primary – teacher)

Integration with curriculum areas

The Guidelines provide examples of how environmental education might be integrated with and across curriculum areas. Integration, notably with science, social science, and technology, was reported as the most common means of school provision of environmental education. This was reported by around 80 percent of primary and secondary Year 9–15 respondents, and 60 percent of intermediate and secondary Year 7–15 respondents. It is difficult, however, to know how respondents construed “integration”: that is, whether they meant environmental education was integrated within a single curriculum learning area, or integrated across two or more curriculum learning areas. It seems likely that the secondary Year 9–15 respondents viewed it as involving the integration of environmental education into either science, social sciences, or technology. A comment from one respondent certainly indicated this was the case.

In teaching science at all levels we incorporate EE into different topics and do not necessarily do a big project on one specific topic. (Secondary – head of department)

Nearly 70 percent of respondents (n=245) who described a unit they considered effective in meeting their environmental education programme purposes said the unit integrated environmental education with science. Twenty percent of the units integrated science, social science, and technology. Fifteen respondents (4 percent), all from primary schools, reported the unit they described as effective was integrated with all seven curriculum areas.
Respondents requested more integrated units and professional development to help with the development of integrated units appropriate for respondents’ local contexts. The Guidelines unit examples were identified as useful in this regard.

In-school support and leadership

A third of the respondents reported they were the environmental education leaders or co-ordinators, suggesting that environmental education was accorded some leadership status in their school. Just over two-thirds of the environmental education leaders held other leadership positions in their school, indicating support for environmental education at the principal and senior management level. A small number of respondents stated that an environmental education co-ordinator was needed in their school.

Approximately half of the respondents claimed general support from principals, deputy/assistant/associate principals, curriculum leaders, and caretakers/grounds staff. Within school support was reported in more primary and intermediate schools than secondary schools. Some respondents, however, identified lack of principal and/or senior management understanding and support of environmental education as a barrier to their teaching a better environmental education programme. This implies that principal/senior management support is important, possibly because of the status of environmental education as an optional subject.

Two hundred and forty-five of the 367 survey respondents described an environmental education unit they had taught. Three-quarters of these said the unit had involved fellow teachers and/or the principal in some way. Caretakers and groundspeople played a role in just over 30 percent of these units, particularly those described by respondents from contributing and full primary schools.

Other support

Respondents from primary schools indicated that the environmental education unit they described was actively supported by parents and Boards of Trustees. A third of respondents who described “effective” environmental education units indicated that local councils, particularly regional councils, provided support and/or were involved in their environmental education unit. The Department of Conservation and a wide range of community groups such as local trusts, iwi, and environmental interest groups were also significant supporters.

Characteristics of classroom-level environmental education practice

A focus on certain areas of content “about” the environment

Respondents described a wide range of environmental education topics and activities. As existing literature on environmental education practice in New Zealand has suggested (see Bolstad, Baker et al., 2004), popular topics included:

- waste management and minimisation (30 percent);
- water studies (fresh and marine) (24 percent);
- planting and gardening (16 percent);
• resource management (9 percent);
• native flora and fauna (9 percent);
• global issues such as the Greenhouse effect (4 percent);
• the school environment (3 percent); and
• arts and culture studies (4 percent).

Most topics were offered across all age groups, but gardening, worm-farming, and recycling were predominantly at primary school levels. A similar range of topics to those listed above were identified by respondents from kura kaupapa Māori, although they pointed out they did not consider they taught environmental education as a learning area in its own right. The units they described explicitly drew on Māori concepts and traditions, usually through the direct involvement of kaumātua and/or families.

The inclusion of activities "in" the environment

Most of the units (92 percent) described as effective in delivering environmental education involved students learning “in” the environment. Units such as recycling, worm-farming and gardening were conducted within the school, and units in water studies and native flora and fauna involved students in activities and actions in the local community. When explaining why they taught environmental education, many respondents focused on its benefits to the school and/or local community. A number of teachers suggested that:

Schools should start with their school grounds, giving students the opportunity to be hands-on and have a sense of ownership and belonging. Their enthusiasm is infectious. (Full primary – curriculum leader)

Activities that include student action “for” the environment

The survey prompted respondents to describe how their environmental education topic had involved students taking action “for” the environment. A variety of student actions were reported, including cleaning up and recycling litter, gardening, planting native trees and plants in the school and along waterways, and writing letters to businesses, community groups, and government departments. Some topics such as resource management and global issues were less likely to yield reports of student actions, but were said to contribute to students identifying and planning for action, and changing student attitudes towards environmental issues.

Twelve percent of respondents indicated the environmental education units they described included student decision-making and/or student-directed action. One respondent reported in a further comment that student-driven projects were “authentic” and this served as a “powerful motivator”.

The success of our environmental programme comes from the fact that it is student-led. The students decide on an action we should take to improve our environment and the teachers help it to happen. The student-driven projects make it authentic for them and this is a powerful motivator. (Intermediate – curriculum leader)
Achievements

Respondents reported a range of achievements for students, for themselves as teachers, for the school, and for the community that accrued from their environmental education units. The development of knowledge about, and awareness of, the environment and environmental issues dominated respondent descriptions of achievements for their students (91 percent of respondents). Just over 60 percent described increased student respect for their environment, or the development of student values and attitudes towards the environment. Thirty percent of respondents reported student action for the environment as an achievement. Other student achievements named were a sense of satisfaction and empowerment, and student enjoyment of learning.

Water and recycling topics were associated with students’ achievements in, for, and about the environment. Student empowerment and satisfaction were a feature of student achievements in the gardening, planting, and recycling units possibly because these topics were also associated with student decision-making and outcomes for the school environment as a whole.

Teachers’ involvement in environmental education not only contributed to teachers’ understanding of the environment and environmental issues but also to the development of teaching strategies. These could range from experience in planning field trips to teaching in a more “action-focused” way that led to greater student motivation. Other notable achievements were teacher satisfaction in student learning and development of environmentally-friendly student attitudes.

For schools and the community the main achievements were improved school environments and improved teamwork and community building within the school, and building relationships with the community. These outcomes were described mainly in connection to planting, recycling, gardening, and water topics respectively.

LINKS, SUPPORT, AND RESOURCES

Consistent with Step 4 of the planning process for environmental education detailed in the Guidelines, respondents indicated they worked with a range of outside services and programmes. Just over 30 percent of the respondents used LEOTC in their environmental education programmes. The TKI Website had been accessed by almost 30 percent (29 percent). Both the Ministry of Education environmental education professional development programme and the National Waterways project were used by just over a quarter of respondents. Given that just over half of the respondents reported they had had in-service environmental education training, local bodies and other community groups appear to account for much of this training. Less than 20 percent of the respondents used the other resources listed (TKI EE, GLOBE, and SOSG). Regional, district, and city councils were most frequently mentioned as providers of environmental education training, or as supporters or participants in school and classroom environmental education programmes. Other important links, support, and resources were provided by other environmental agencies, community environmental groups, trusts, iwi, and the community. These groups were reported as making a valuable contribution to school and classroom environmental education programmes. “Effective” environmental education units often included opportunities for students to listen to and question environmental sector professionals.
Our school has many environmental projects from planting of organic heritage fruit trees, olive growing and processing, worm farms etc. Tremendous support from caretaker, council, environmental organisations. (Full primary – curriculum leader)

Time constraints and school-based hindrances such as curriculum overcrowding, lack of leadership and support, school location, and lack of funding were perceived to be the main barriers to forming links with supporting organisations in environmental education. Communication difficulties arising from different work patterns exacerbated any difficulties and so did mismatches in goals and expectations. For instance, an outside organisation may not appreciate the constraints imposed by a school timetable and might have a purely environmental rather than educational focus. Perhaps for this reason, a strong recommendation from respondents was that a central database of materials, programmes, services, and people be established by the Ministry of Education, possibly on the Internet. None indicated they were aware of the New Zealand environmental education directory (Ministry for the Environment, 1999).

Almost half of the respondents judged the adequacy of funding to be “inadequate” and a further quarter judged it as “somewhat inadequate” to meet the needs of their environmental education programmes. However, nearly two-thirds (62 percent) assessed teacher access to information to be “adequate” or “reasonably adequate”, and over half of the respondents (58 percent) said that their access to resource materials was “adequate” or “reasonably adequate”. In considering these responses, however, it needs to be remembered that the sample was of schools with some involvement in environmental education as identified by providers of environmental education programmes and services and so a high satisfaction rate might be anticipated.

Nearly two-thirds (60 percent) of those who commented on the adequacy of government policy described it as either “somewhat inadequate” or “inadequate”. As respondents did not elaborate on their view it is not possible to determine the reason for the perceived inadequacy. However, some respondents indicated that the non-mandatory status of environmental education was an issue for them. This is discussed further below.

**SUPPORT NEEDED FOR THE PROVISION OF ENHANCED ENVIRONMENTAL EDUCATION**

Factors identified by respondents as having the potential to help them teach a better environmental education programme fell into two main categories, one practical and the other more policy-based.

**Practical help with the teaching of environmental education**

The first form of help requested by respondents addressed issues to do with their own knowledge and awareness (of the environment, environmental issues, and teaching) and with teaching and taking action within environmental education. The main practical help requested was:

- better/more teaching resources;
• additional funding to assist with the costs of field trips, equipment, and teacher release time for planning and action, and further professional development for themselves and their colleagues;
• help with planning for integration; and
• opportunities to work with “experts” and/or for these individuals to work with their classes.

Respondents teaching in kura kaupapa Māori considered their programmes would benefit from more resources for teaching and professional development consonant with the Māori world view in te reo Māori. Five percent of respondents suggested that they would like to share ideas between schools and with environmental education agencies. Some respondents indicated they would like more access to current professional development and programmes, and others that their participation in professional development for environmental education had been a stimulus for serious development of environmental education in their school.

We have been involved in environmental education without calling it that but are at a new beginning of our journey forward in environmental education with being involved in the pilot schools project in 2003. (Full primary – curriculum leader)

Alongside this there was some indication that the structure of school timetables constrained what respondents were able to do as part of their environmental education programmes. As one pointed out, it is difficult to undertake a project in one-and-a-half hours.

The ambiguous status of environmental education in the New Zealand Curriculum Framework

The other factors respondents thought would help them provide more effective environmental education programmes flowed from the ambiguous status of environmental education in the New Zealand Curriculum Framework. Respondents identified both curriculum overcrowding and the non-mandatory status of environment education as issues in this regard. Some respondents, presumably those who were lone enthusiasts and/or from schools where there is only limited support for environmental education, suggested that their programmes would benefit from greater in-school leadership (from the principal, an environmental education co-ordinator, and/or the Board of Trustees) and from whole staff involvement. Respondents from both primary and secondary schools noted that, while environmental education was a valuable area of learning, there really was not enough time to do the subject justice given the perceived “over crowded curriculum”.

There needs to be some way to balance school programmes as there are far too many curriculum areas for a teacher to do ‘justice’ to. (Contributing primary – teaching principal)

The issue for our school is the ‘crowded curriculum’ hence a decision for 2003 to remove the current option subject called Environmental Education. In 2003 we plan to ‘map’ the teaching in other subjects of environmental education to see if there are gaps. (Secondary – deputy principal)
Many of the respondents explained that integration was the only way they could include environmental education in their programme, suggesting that the integration of environmental education into classroom learning was often up to the individual teachers who saw an opportunity to do so. Respondents indicated they saw environmental education as a valid “extra” whilst others saw it as an “add-on” that competed for their attention with other government initiatives.

We are already VERY BUSY and not looking to extend curriculum whilst acknowledging the value of the programme. I regard it as currently being a valid ‘extra’ and a strand to informally include, emphases in existing programmes.

(intermediate – deputy principal)

Some primary school respondents (6 percent) pointed out that environmental education competed for their attention with the numeracy and literacy initiatives.

Few teachers seem to be motivated to include environmental education - perhaps as the ‘new’ [numeracy] initiative has gone around schools this year, an environmental educator could speak to schools to encourage and expand a knowledge base to inspire teachers to include environmental education in their programmes. (Intermediate – teacher)

Likewise, a secondary school respondent cautioned any introduction of environmental education would need to be carefully planned so as not to clash with the National Certificate of Educational Achievement (NCEA).

Environmental education is a long overdue initiative, but nonetheless welcome and well conceived. However it needs to be made mandatory for schools to formulate and carry out environmental policies, audited by ERO, within a few years. Careful implementation is essential and it must not be botched by ‘clashes’ with NCEA implementation demands on teachers’ time and energy!

(Composite/restricted composite – teacher)

There was some suggestion that environmental education could be made mandatory in schools although others cautioned it is “as much a state of mind” as a structured programme.

I am not sure schools can cope with adding yet another curriculum add on. The best option for environmental education is to continue to educate/inform teachers over a variety of curriculum areas about environmental issues etc.

(Secondary – head of department)

**THE ROLE OF THE GUIDELINES FOR ENVIRONMENTAL EDUCATION IN NEW ZEALAND SCHOOLS**

Half of the respondents indicated a familiarity with the *Guidelines for environmental education in New Zealand schools*. This is somewhat lower than might have been expected given the sample. In particular, half of respondents from schools that had participated in Guidelines’ training were unaware of the document or not familiar with its contents. Respondents who held an environmental education leadership position in the school, or had participated in environmental education in-service training, were more familiar with the *Guidelines* than other respondents.
Mainstream school respondents’ descriptions of the meanings they held for environmental education and the purposes they sought to achieve were consonant with the aims and dimensions of the *Guidelines*.

Respondents from kura kaupapa Māori foregrounded their personal and familial sense of connection with the environment, indicating that the Māori worldview and *Te Aho Matua* (the principles underpinning kura kaupapa Māori) are consonant with the four key concepts of environmental education.10

Forty percent of those who commented on the *Guidelines* found them useful or very useful for planning. The usefulness of the *Guidelines* for planning was related to awareness of the document, with just over 60 percent of those who were familiar or very familiar with the *Guidelines* reporting they found them useful or very useful for planning. The *Guidelines* were considered to be useful for focusing planning and for supporting cross-curricular integration through the provision of examples of units of work.

> The curriculum links in the back of the Guidelines are really helpful. More suggestions like that would be good. Suggestions for making environmental education an ‘umbrella’ over other curriculum areas would be useful. (Contributing primary – principal)

The survey did not specifically ask which (if any) individual components of the *Guidelines*’ eight-step planning process teachers used, although commentary on what would help them teach a better environmental education programme suggests support for steps 3, 4, and 5 (developing links to the curriculum, and links with other agencies or people involved in environmental education) was important to respondents.

**DIRECTIONS FROM THE CRITICAL STOCKTAKE FINDINGS**

**Respondents’ views of environmental education**

Respondents saw environmental education primarily in terms of education “about” the environment with a secondary focus on students coming to respect and care for the environment. Student actions “for” the environment were less frequently mentioned in respondents’ definitions of environmental education, their stated purposes for teaching environmental education, and their descriptions of student achievements in environmental education.

The *Guidelines for environmental education in New Zealand schools* (Ministry of Education, 1999) were seen as useful by those who were familiar with them (about half of the respondents), particularly those who were environmental education leaders or co-ordinators.

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10 Some of the differences between mainstream and kura kaupapa Māori responses may be due to the different way the data was collected, namely, a written survey (mainstream schools) versus face-to-face interviews (kura kaupapa Māori).
Characteristics of environmental education in New Zealand schools and kura kaupapa Māori

The critical stocktake suggests that environmental education in New Zealand schools:

- involves a wide range of activities;
- includes student participation in activities outside the classroom, particularly in the school grounds but also in the local environment;
- involves students taking practical action such as gardening, planting, and clearing up litter in the school grounds and local community along with monitoring waterways, students making and implementing decisions and students advocating in the home and community;
- is thought by teachers to contribute to a better school and/or community environment, and to enhance school-community relationships;
- enhances student knowledge and understanding of the environment and environmental issues and develops student values and attitudes towards the environment;
- may involve an enthusiastic individual or small groups of teachers or the whole school (principal, staff, student interest groups, and caretaker);
- may involve the wider school community, particularly parents and Boards of Trustees;
- involves the use of environmental education service and programme providers, particularly local authorities;
- may involve environmental sector professionals; and
- may involve community-based environmental and service groups.

Challenges and issues for environmental education practice

Respondents identified the following as challenges or issues for their involvement in environmental education:

- the non-mandatory status of environmental education;
- the challenge of integrating environmental education into other learning areas;
- the need for whole school support and involvement;
- the need for in-school leadership (from the principal and/or an environmental education co-ordinator);
- the need for further professional development for themselves or for their colleagues;
- the need for resourcing in the form of environmental education units and the equipment needed to take action “for” the environment; and
- the need for funding for teacher release time to plan, prepare and share ideas, make contact with support people, and be involved in action “for” the environment.
SUMMARY OF FINDINGS FROM THE CASE STUDIES

The case studies report (Volume 4) describes examples of environmental education practice in eight New Zealand schools and kura kaupapa Māori. Each case study is reported in full in Volume 4. Themes and issues from the eight case study schools/kura are described here under four main areas:

- Factors contributing to the initiation of environmental education in the case study schools
- Common features of the school contexts
- Characteristics of environmental education practice in the case study schools
- Challenges and issues arising for the schools.

FACTORS CONTRIBUTING TO THE INITIATION OF ENVIRONMENTAL EDUCATION IN THE CASE STUDY SCHOOLS

Personal passions and professional development in environmental education

In all the schools, there was at least one person on staff who had a personal interest or passion for environmental education. In most cases, two or three people (teachers and/or a principal) were the main initial force for developing environmental education in the school. At least one of these people (usually the designated environmental education co-ordinator) had participated in the Ministry of Education’s environmental education Guidelines professional development training. In some cases, teachers found out about the professional development through existing personal networks and connections with the local environmental education community of interest, or through school advisers or tertiary environmental educators. In other cases, teachers stumbled across the professional development through good luck or good timing, but recognised an opportunity to link the environmental education professional development with what they were already doing (or trying to do) in their school. One school had no involvement with the Ministry of Education environmental education professional development. In two schools, at the time of the case study, the lead environmental education teacher was on study leave to deepen their knowledge and qualifications in environmental education.

Role of the Guidelines and involvement in formalised environmental education programmes

The lead environmental education teacher(s) in each school endorsed the Guidelines, and used these as the basis for planning and implementing the school’s environmental education. In at least two cases, the lead environmental education teacher had not known the Guidelines existed until they encountered them outside the school. In most cases the lead environmental education teacher had tried to educate other staff, for example, by distributing copies of the Guidelines to all staff or all heads of department, or leading whole staff meetings about environmental education. Staff who had not participated in environmental education professional development often recognised
the *Guidelines*, but were not directly familiar with their contents. Some teachers were aware of the three key dimensions (education in, about, and for the environment) or other aspects of environmental education outlined in the *Guidelines*, because the environmental education co-ordinator had taken staff through these.

Six of the case study schools were environmental education professional development “Pilot schools”, and two were, or were about to become “Enviroschools”. Although lead environmental education teachers in the case study schools often said environmental education had been part of their own teaching for a long time, environmental education had only become significant in most of the schools during the last two or three years. Staff in the case study schools described the opportunity to be part of a formalised environmental education programme as a significant source of motivation and inspiration to formalise the school’s commitment to environmental education.

**The local context and environment**

The local environment was a significant trigger for environmental education for most of the schools. Many of the schools saw environmental education as an opportunity to promote students’ sense of connection and responsibility for the local surrounding environment. At least two schools were engaged in the care and protection of an existing stand of native bush on the school site, and several schools were replanting native trees and plants on the school grounds. Two schools were next door to coastal or estuarine environments. Maintaining or enhancing the school grounds, planting and caring for gardens, and litter and waste management, were important issues for several schools. The cultural and historical significance of the local environment was also important to several of the schools, particularly those that placed a high value on including Māori knowledge and values in the school culture.

**COMMON FEATURES OF THE SCHOOL CONTEXTS**

**Vision, leadership, and triggers for school change**

The principal’s role appeared crucial for the development of environmental education in several schools. Interestingly, at least four of the eight schools had undergone a change of principal in the last five years. In at least two schools, a previous principal had been a key player in instigating the school’s environmental education, and the new principal was committed to sustaining environmental education in the school. In other cases, principals lent active or passive support to whichever staff were the key players in environmental education in the school.

In addition to changes of principal, several schools had undergone a significant school culture change in the last five years. The scale and depth of change varied, from whole schools re-examining their core values, and making many changes to policy and practice, to the gradual broadening in the kinds of learning experiences available to students. Some of the triggers for change included: the sense that the school needed to change to better meet the needs of students or the local community; the retirement of long-serving teaching staff and the subsequent appointment of new staff; and a zoning change, leading to a more diverse student demographic. The relationship between environmental education and these wider school changes differed across schools. In some cases, the development of environmental education was a fundamental
component of the school’s culture shift/re-orientation. In other cases, the changing culture of the school created a fertile bed in which environmental education could begin to flourish. In at least one school, a significant culture change was occurring over the top of an existing commitment to environmental education. Although this school’s commitment to environmental education remained, the culture change (a re-orientation to bring the school into a closer relationship with local iwi) meant that environmental education sometimes had to compete with other priorities in terms of staff time and energy.

**School values, culture, and philosophy**

Most staff and students in the case study schools spoke highly of the culture of their school. A common feature across many of the schools was that values were an explicit part of the school’s language and practice. The specific culture and values differed across the schools: Māori values underpinned the culture of the kura kaupapa Māori; Christian values underpinned another school’s culture; Montessori philosophy contributed to the values and culture of yet another school. Being rural was a significant aspect of three schools’ cultures.

At least two schools (a primary school and a kura kaupapa Māori) were part of formalised “values education” networks, and had committed to school-wide professional development in values education. The values and culture of the schools were often visible during the case study visits, for example, in the interactions between principals, teachers, other staff, and students; or in visual displays on the walls of classrooms, staffrooms, or assembly halls. In many schools there was a strong consistency of perspectives between principals, teachers, students, and others associated with the school. In general, it was easier to identify shared views, perspectives, and practices in the primary/intermediate schools and the kura kaupapa Māori, than in the secondary and composite schools.

**Values in relation to the environment**

Many of the schools described themselves as “environmental” schools. In some cases the schools had some kind of written vision statement which identified “the environment” or “care for the environment” as a key pillar or core value of the school. Care and respect for the environment was often seen as fitting naturally alongside the schools’ emphasis on students’ care and respect for themselves, and care and respect for other people. Maintaining a safe social and emotional environment for students was clearly important in most of the schools.

**The role of Māori knowledge and values**

Obviously, Māori knowledge and values wholly underpinned the culture of the kura kaupapa Māori. However, Māori knowledge and values also had an intentional and visible role in the culture of four of the seven mainstream schools. Each of the four schools had between 30 and 55 percent Māori students, and two schools also had rumaki (Māori immersion classes) within the school. The status of Māori knowledge and values in one school had gone from slight, to prominent, in just the last 18 months. Some of the ways that Māori knowledge and values were integrated into various schools’ cultures included:

- using Māori words and names throughout the school;
• adopting Māori customs for welcoming visitors, blessing new spaces, or meeting with the community;
• compulsory learning of te reo Māori for staff and students;
• timetabling kapa haka or waiata practice into the school week;
• whānau (mixed-age) groupings in classes;
• negotiating a special protocol for local kaumātua and kuia to come into the school; and
• considering the current and historical significance of the school’s local environment for local iwi and hapū.

The other three mainstream schools did not identify Māori knowledge and values as having a major focus across the school, although it was said to feature in some subjects/classrooms or cultural activities in the school. One school had approximately 30 percent Māori students. Two schools had fewer than 5 percent Māori students. Some staff from each of these schools regretted the school’s lack of emphasis on Māori knowledge and values, and in some cases indicated that the school was beginning to place a higher priority in this area.

Proactive approaches to staff professional development

There was a strong emphasis on whole staff professional development in three or more of the schools, where the focus of professional development was explicitly on teaching and learning. Some of the schools had regular whole staff professional development meetings to talk about teaching and learning practice. One secondary school was about to establish a staff teaching and learning group that would meet regularly to discuss such issues. One intermediate school’s principal had a philosophy of encouraging teachers’ “passions”, and supporting their professional development in whichever areas were of interest to them.

Student leadership and responsibility

While principals and staff at most schools talked about the importance of student leadership and responsibility, the degree to which this was manifested in practice varied across schools. At several schools, there was a clear and consistent commitment to student leadership and encouraging students to take responsibility for their own learning and behaviour. One intermediate school principal aimed to develop a “school of leaders”, and felt that every person in the school, from students to teachers, should have a say in deciding what and how things happened in the school. Teachers in another primary school took pride in the level of trust and responsibility given to students. Other ways that student leadership and responsibility were manifested in the schools included: students being encouraged to give speeches and presentations to audiences outside the school (for example, students and teachers from other schools, or regional councils); and classroom “values contracts”, devised by teachers and students as a set of rules and principles for acceptable behaviours.
Characteristics of Environmental Education Practice in the Case Study Schools

Focusing on the School Environment

All but one of the schools initiated their environmental education with a strong focus on the school grounds and school environment. As already noted, most of the schools had direct access to local natural environments such as native bush, beaches, and estuaries, and used these as environmental learning contexts. Most schools engaged in some form of gardening and associated activities (worm farming, composting, organic methods), particularly with primary- and intermediate-aged students. Native plants and trees were commonly used. In at least three schools, primary students had planted and nurtured their “own” native plant in a school re-landscaping exercise. Primary teachers often talked about gardening and planting activities as a way of establishing children’s sense of connection and care for the environment. Several schools were interested in Māori medicinal use of plants and trees.

Litter management, recycling, school grounds improvement, and waste reduction also figured prominently in most of the schools. For some schools, controlling litter was a constant battle, which did not seem to change despite the school’s environmental education activities. However, at least one school had little or no problem controlling litter. Some schools were moving towards “zero waste”, and had established “radical” measures to reduce and recycle as much school waste as possible. One school had made an arrangement with the local shop to have a “plastic free” day once a week, where students did not bring any plastic food wrappings into the school grounds.

Snowballing and Layering of Environmental Education Activity

One or two classrooms, taught by the lead environmental education teacher(s), formed the epicentre for environmental education in most of the schools. Often, environmental education began to “snowball” across the school and into other classrooms. This could occur through environmental education teachers sharing unit plans and resources with other teachers, or through the initiation of school-wide practices like recycling and composting. In the primary and intermediate schools, there was often a layering of environmental education activities. For example, a few classrooms might be engaged in extensive environmental education projects and activities. Students from other classrooms might be involved through extra-curricular activities (a gardening club, a student environmental committee, or “intensives” programmes). The whole school might be involved in recycling, composting, gardening, etc. The proportion of staff and students actively involved in environmental education in each school, at any given time, varied. At some of the primary schools, the kura kaupapa Māori, and one composite school, there were efforts to make environmental education a whole school movement. At one secondary school, environmental education comprised one specialist environmental education NCEA subject. At another secondary school, environmental education was mainly taught within individual subjects such as science, biology, geography, and outdoor education, and was only just beginning to be viewed as an explicitly integrating strand across curriculum areas.
Curriculum integration and curriculum planning for environmental education

It was normal practice in the primary and intermediate schools to teach an integrated curriculum. Environmental education was usually infused into plans for teaching and assessing the mandated curriculum learning areas and the essential skills.

Although environmental education was not subject to the same assessment requirements as other learning areas, some primary and intermediate schools used curriculum planning templates which featured explicit environmental education learning goals. In one school, where environmental education was mainly practised in two or three out of twenty classrooms, environmental education teachers had given their unit plans and resources to other teachers in their school to use.

Environmental education was most often linked to science, social studies, technology, and health, but also featured in English, mathematics, and the arts. One secondary school taught environmental education as a subject in its own right, primarily integrating science/biology and social studies/geography concepts and assessment standards. An area school had successfully integrated environmental education across the primary school but had found it more difficult to do so in the secondary school. In both secondary schools, lead environmental education teachers saw environmental education as an opportunity to increase the amount of curriculum integration generally in the school.

Usually, the environmental education co-ordinator took responsibility for building environmental education into curriculum planning at classroom level, syndicate level, or school-wide level. At one primary school, the entire year’s teaching was built around a theme (water) which lent itself to a whole-year environmental education focus. The kura kaupapa Māori planned to build its curriculum around a major environmental education project the following year.

Commitment to large-scale environmental action projects

Environmental education involved a large-scale action project in many of the schools. These projects were unusual compared to normal teaching and learning practice in terms of the time and energy required to carry them out. The primary school which built an entire year’s teaching around the theme of “water” had every class in the school working on a major project about improving the health of a local stream over several terms. Two or three classes at an intermediate school undertook a major project to plan, design, and construct an “Island of Life” (a stand of native plants to attract birds and insects) in the school grounds. The kura kaupapa Māori chose to focus their environmental education on the care and protection of a local island. To this end, staff, their families, and the school prefects planned to camp on the island the week before school started. Once school began, every other student in the school would have the experience of living on the island. At one secondary school, students were going to plan and carry out their own action project over a term or more.

In several schools, whole class projects involved students (guided and supported by teachers) identifying an environmental issue, making decisions, liaising with sponsors, community agencies, or the media, and executing actions identified as necessary for reaching their environmental goals. However, student-led projects sometimes encountered difficulties. In one composite school, a student-led environmental education project to enhance the school grounds ran into difficulties when other members of the school community overrode the decisions and actions of the students and teachers involved. In another secondary school, teachers and students...
both commented that students did not normally have the opportunity to have input into how their classroom teaching and learning should happen, and that the environmental education class was unusual in this respect.

**Support within the school and school community**

The overall level of support for environmental education from other staff within the school varied between schools. In some schools, all or most staff, even those not centrally involved in environmental education, were said to support environmental education in the school. In other schools, staff who were not leaders in environmental education were more disinterested, apathetic, or suspicious of environmental education. In some schools, the caretakers’ support was an important enabling factor.

There was a range of levels of support and involvement from the school community. At one school, the students’ end-of-year performance was built around their environmental education project, and through their performance they shared their experience with their parents and family.

**Support from local environmental education people or agencies, and the media**

Regional councils supported environmental education projects, either through the involvement of regional council staff, or through financial sponsorship, in at least three case study schools. Several schools actively sought out sponsorship and media coverage of their environmental education activities from the local community.

A high point for two schools was the opportunity to send a small group of students to international environmental education conferences, to talk about their school’s environmental education activities.

**Formalising environmental education into school policy and planning**

Several of the case study schools were on the verge of formalising their commitment to environmental education into school policy and/or charter documents. Lead environmental education teachers were often concerned that environmental education was dependent on their continued involvement, are were keen to see environmental education more deeply embedded in the school’s planning and practice. At one composite school, the former environmental education co-ordinator (primary school) stepped back so that a secondary teacher could take on this role and bring environmental education further into the secondary school. At an intermediate school, the role of environmental education co-ordinator had been held by a succession of three teachers, each of whom felt that environmental education was now firmly embedded into the school.

**Challenges and issues arising for the schools**

The main issues and challenges for the schools were:

- dependence on key people to provide energy and expertise in environmental education;
• the amount of time and energy required to sustain environmental education projects;
• getting other staff and/or Board of Trustees “on board” with environmental education;
• having sufficient resources/units/ideas for environmental education teaching and learning;
• ensuring the sustainability of environmental education by developing school structures and policies to support it, planning for “sustainable” environmental education teaching, or projects that can be sustained for successive cohorts of students; and
• having time to establish and maintain links with the community and environmental agencies.
RESPONSE TO THE RESEARCH QUESTIONS

This section draws together the findings of the literature review, the critical stocktake, and the case studies, and responds to the seven research questions.

1. **What are key characteristics of effective practice in environmental education nationally and internationally that lead to students developing and demonstrating the skills, knowledge, attitudes, values, and actions that support the aims of environmental education?**

**International research**

The literature review found a wide range of perspectives on what constitutes effective environmental education practice. The last thirty years has seen the growth and development of a body of literature that has established environmental education’s theoretical/philosophical goals, what these means in educational/pedagogical terms, and what the implications are for schools. This body of literature indicates that “effective” environmental education:

- is education in, about, and for the environment;
- is relevant, holistic, values-orientated, socially critical, issues-based, and action-orientated;
- helps students to recognise that environmental problems are structurally anchored in society, and therefore have to be understood as community issues with conflicting interests at individual, social, and structural levels;
- focuses on the development of students’ “action competence” and treats students as active participants in all aspects of the environmental education experience;
- supports students to identify problems, determine solutions, and take action in a way that empowers them to become competent (and willing) participants in future actions that contribute to the solution or avoidance of environmental problems; and
- often involves a complex process of change for teachers and schools to achieve.

Despite finding examples of environmental education projects and initiatives in a range of countries, the literature review found very little research evidence for the effectiveness (or otherwise) of environmental education in terms of outcomes for learners. There may be two reasons for this. First, the literature suggests that the ideal outcomes of environmental education for students (i.e., knowledge, skills, awareness and sensitivity, attitudes, values, and ability to act) may be difficult outcomes to measure in the short term. Most existing studies of student learning in environmental education have concentrated on evaluating outcomes such as gains in students’ knowledge about the environment and environmental issues, and to a lesser extent, changes in students’ attitudes towards the environment. However, the notion of “action competence” (Jensen and Schnack, 1997) suggests that ultimately the effectiveness of environmental education might be assessed by learners’ action/reaction to an authentic environmental issue some time (perhaps years) after they have participated in an environmental education learning experience at school. Because such long-term evaluation is difficult to do, it would seem necessary to develop an array...
of assessments that would help teachers to evaluate the impact of school-based environmental education for students while they are still at school.

Second, initiatives which have sought to increase the effectiveness or impact of environmental education in schools often focus on developing (and evaluating) teachers’ understanding of the goals and aims of environmental education, and supporting teachers to become more reflective about their teaching practices. These initiatives also often involve partnerships and networks between schools, tertiary educators, and people from the environmental education community of interest. Research associated with these initiatives has often focused on exploring teachers’ views and perceptions of environmental education, or identifying factors that help or hinder the implementation of environmental education. Again, there has been less attention to evaluation of the effectiveness of these initiatives for students.

Finally, the literature suggests that the kinds of practices deemed to support good environmental education, such as whole school integrated approaches, are often in conflict with conventional school organisation and structures, and are not necessarily easily implemented in the mainstream of schooling. Where environmental education initiatives have been successful in schools, it is often in the form of “pilot” projects, with marginal impact for the majority of schools. Recognising this, some international environmental education groups are seeking to identify strategies to move environmental education “from the pilot to the mainstream” (Ministry of Education Research and Church Affairs (Norway), 1999).

Evidence from New Zealand

The critical stocktake and case studies suggest that effective environmental education practice in New Zealand schools often involves:

- key staff who are dedicated to environmental education;
- whole school involvement with support from the principal/senior management and/or the Board of Trustees, parents, and school community;
- the development of school policies and plans to give environmental education an official status in the school;
- integration of environmental education into school curriculum, classroom learning, and regular school practices;
- whole staff professional development, and good staff understanding of the goals and aims of environmental education;
- strong links with environmental education people and agencies, and people in the environmental sector (e.g., gardeners, recyclers, landscapers); and
- student involvement in planning, decision-making, and action.

The critical stocktake suggested that the views and perceptions that underpin environmental education practice in New Zealand schools and kura are not always fully consistent with the goals and aims of environmental education explicated in the international literature. For example, most survey respondents saw environmental education primarily in terms of education “about” the environment with a secondary focus on students coming to respect and care for the environment. Although survey respondents described a range of student actions “for” the environment including gardening, recycling, and environmental advocacy in the home and community, there was less
evidence that survey respondents considered student decision-making or student choice as a central facet of action “for” the environment.

By contrast, student action “for” the environment featured prominently in the case study schools. Although staff at the case study schools talked about the importance of student leadership and responsibility, the degree to which this was manifested in environmental education practice varied across schools. The case study schools were at different points in their development of environmental education. Some were just starting their involvement in environmental education, while others had been developing their environmental education programmes for three or more years. Most of the schools engaged in a wide range of ongoing activities relating to planting, gardening, recycling, and sustainable waste management. However, projects at some schools involved students (guided and supported by teachers) identifying an environmental issue, making decisions, liaising with sponsors, community agencies, or the media, and executing actions identified as necessary for reaching their environmental goals. (Examples in Volume 4 include: Kamo Intermediate School’s “Islands of Life” project; Otari School’s stream protection project; the transformation of “nothing areas” at Papatūānuku School; the Project Crimson tree-planting project at Snapper Point School; and the “Major action project” for Year 12 “Sustainable futures” students at Christchurch Girls’ High School.)

2. What are some of the larger similarities and differences that exist between international practice and New Zealand practice, including the role of central agencies?

The literature review discusses environmental education as a “marginal” form of education, which has struggled to secure a place in the formal education system in many countries. The environmental education movement is strongly linked to global environmental priorities and many of its core principles are derived from international statements including the 1977 Tbilisi Declaration and Agenda 21 of the Rio Earth Summit. In the 1980s and 1990s, governments in various countries responded to their obligations under international summits and treaties (and to pressures from the environmental education community) by implementing new or revised environmental education policies and curricula.

In most countries, environmental education networks and the environmental education community of interest play a large role in promoting and supporting strategies for environmental education. The literature review described two examples of international networks (ENSI and the Asia-Pacific networks) that have connected interested individuals and provided an incubator for ideas, sharing, theorising, and resource development in environmental education. However, these networks are not in a position to mandate policies, and environmental education has not always been seen as educational priority within the formal education sector.

Some national and state governments appear to have taken a strong leadership role in bringing environmental education into the formal education system (e.g., the Netherlands, Norway, Austria, New South Wales, and Wisconsin). The role of central agencies in these countries and states typically appears to evolve through a series of phases. First, there is a “mandating” stage, in which a decision is made about the policy and curriculum status of environmental education. At this stage, environmental education may be made a compulsory or optional “integrating” strand of the curriculum. New textbooks or “Guidelines” documents for teaching environmental education may be produced accordingly. There may also be mandates for compulsory pre-service or in-
Second, there is a “resource development, programmes, and initiatives” stage, where central and regional agencies, NGOs, and other stakeholders in environmental education develop a wide array of teaching resources, services, and programmes intended to support the teaching of environmental education in schools. Evaluations of the effectiveness or impact of these initiatives for school environmental education practices during this stage tend to find positive impacts only in a limited number of schools, with many teachers generally unaware of their existence. The initiatives may produce superficial changes to school policies or the school grounds, but few changes to teaching and learning practices, or the views which underpin them. Teachers may not know where to access environmental education programmes, services, and resources, or feel they are not appropriate or relevant to the school curriculum. Schools may perceive a lack of co-ordination between environmental education providers, and choose not to engage with these providers.

Finally, some countries move into a third stage, where the emphasis is on co-ordination of existing resources, programmes, and services, and on enhancing the quality of support for schools to make good use of these. In the Netherlands, for example, this is said to have led to a “process model” rather than an “implementation model” of environmental education development, where the goal has been to create structures to support development of quality processes, dialogue, and professional development.

In New Zealand, both the Ministry of Education and the Ministry for the Environment have been involved in the development of policies and initiatives to support environmental education. This is sometimes perceived to have resulted in a division of effort and a lack of co-ordination between the two ministries. Each ministry has funded programmes and initiatives to support environmental education, with the Ministry for the Environment programmes largely focusing on local government and the community sector, and the Ministry of Education programmes focusing more specifically on the school sector. New Zealand has many environmental education “stakeholders”, including people from central and regional government, NGOs, schools, tertiary institutions, tangata whenua, and other groups with an interest in environmental issues. Recent reports on the effectiveness of networking in environmental education in New Zealand (Mardon, 2001; McClelland, 2000) suggest that it can be complex to establish and maintain links between these different stakeholders. In part, the complexity has arisen because of stakeholders’ different motivations, interests, and activities in environmental education, particularly with many stakeholders working outside the formal school sector. Respondents to the critical stocktake described difficulties including not knowing the names of people or organisations they might contact, or not having enough time to make these contacts. Communication with outside agencies could be difficult when teachers were only available during breaks or after school.

International examples of successful environmental education suggest that efforts need to be made to co-ordinate across sectors/agencies, particularly when multiple agencies seek to engage with schools. For example, the Netherlands, the UK, and Australia have all established groups or

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11 This comment was made by several environmental education stakeholders whom we contacted during the development of the literature review and critical stocktake, and also by reviewers to the draft literature review in February 2003 (see Volume 2).
initiatives to co-ordinate activities, material, and resources across sectors. Some stocktake respondents suggested this sort of co-ordination was needed in New Zealand.

With the push for holistic approaches in schools that involve people and agencies from across the community, there needs to be an understanding by all participants of what environmental education is and the roles that different partners can take in contributing to sustainable environmental education in schools. In New Zealand, creating links with community agencies still relies on the school’s ability to translate or incorporate outside expertise into effective environmental education learning situations. Interactive professional development between teachers and community agencies with a stake in environmental education could assist external people and agencies to work with schools in a way that promotes education for the environment and raises the level of education for all participants.

3. What are the key characteristics of environmental education practice in schools/kura in New Zealand at this time?

The critical stocktake suggests that environmental education in New Zealand schools:

- involves a wide range of activities;
- includes student participation in activities outside the classroom, particularly in the school grounds but also in the local environment;
- involves students taking practical action such as gardening, planting, and clearing up litter in the school grounds and local community along with monitoring waterways, students making and implementing decisions and students advocating in the home and community;
- is thought by teachers to contribute to a better school and/or community environment, and to enhance school-community relationships;
- enhances student knowledge and understanding of the environment and environmental issues and develops student values and attitudes towards the environment;
- can lead to the development of new teaching approaches, including those that value student leadership and decision-making;
- may involve an enthusiastic individual or small groups of teachers or the whole school (principal, staff, student interest groups, and caretaker);
- may involve the wider school community, particularly parents and Boards of Trustees;
- involves the use of environmental education service and programme providers, particularly local authorities;
- may involve environmental sector professionals; and
- may involve community-based environmental and service groups.

The case studies suggested that environmental education flourishes in schools where there is an existing culture of care and respect for self, care and respect for others, and care and respect for the environment. Factors contributing to the initiation of environmental education in the case study schools included: having someone with a personal passion for environmental education; the school’s involvement in a formalised environmental education programme (such as the Ministry of Education environmental education professional development programme or Enviroschools);
and a desire to promote students’ sense of connection and responsibility for the local surrounding environment. All but one of the case study schools initiated their environmental education with a strong focus on the school grounds and school environment. Often, environmental education began to “snowball” across the school and into other classrooms. This could occur through environmental education teachers sharing unit plans and resources with other teachers, or through the initiation of school-wide practices like recycling and composting.

Some common contextual features in many of the case study schools included:

- vision, leadership, and a whole school culture change intended to better meet the needs of students, or the local community;
- “values” being an explicit part of the school’s language and practice;
- having some kind of written vision statement which identified “the environment” or “care for the environment” as a key pillar or core value of the school;
- recognising a role for Māori knowledge and values in the school’s culture and practices; and
- a strong emphasis on whole staff professional development, with a focus on issues related to teaching and learning.

Several of the case study schools were on the verge of formalising their commitment to environmental education into school policy and/or charter documents. Lead environmental education teachers were often concerned that environmental education was dependent on their continued involvement, are were keen to see environmental education more deeply embedded in the school’s planning and practice. The overall level of support for environmental education from other staff within the school varied between schools. In some schools, all or most staff, even those not centrally involved in environmental education, were said to support environmental education in the school. In other schools, staff who were not leaders in environmental education were more disinterested, apathetic, or suspicious of environmental education.
4. To what extent do environmental education programmes in New Zealand schools generally follow the planning process identified in the *Guidelines for environmental education in New Zealand schools*?

The eight steps are:

**Table 8**

*Process for planning environmental education programmes within the New Zealand Curriculum Framework*

(from Ministry of Education, 1999, pp. 17–20)

| Step 1: | Identify student needs |
| Step 2: | Review current programmes |
| Step 3: | Identify new opportunities for the inclusion of environmental education within the New Zealand curriculum |
| Step 4: | Identify possible links between school programmes and initiatives undertaken by regional and local councils and by community agencies |
| Step 5: | Decide how environmental education will be managed within the framework of the New Zealand curriculum |
| Step 6: | Develop programmes based on effective teaching and learning approaches |
| Step 7: | Select appropriate resources to support teaching and learning programmes |
| Step 8: | Plan how evaluation will be carried out |

The critical stocktake and the case studies found that the *Guidelines* were perceived as useful by those who were familiar with them, though this was usually only the environmental education co-ordinator and possibly one or two other teachers in the school. Environmental education co-ordinators often used the *Guidelines* as the basis for planning the inclusion of environmental education in school-wide curriculum plans.

Involvement in formalised environmental education programmes (e.g., Ministry of Education environmental education professional development) was often a stimulus for going through this 8-step process. There was evidence that steps 1–7 were often achieved. Step 1 was particularly noticeable in several of the case study schools, where “student needs” in the broadest sense seemed to drive the school’s initiation into environmental education. These schools considered questions like: “What do we value in our school? What kind of person do we want our school to produce? How is our school serving the needs of our students or our local community?” Often, the answers to these questions were:

- We value our local environment and our local community.
- We want our students to be full participants in society, and be able to make good decisions and choices in the future.
- We want to give our students a broad curriculum where they will experience authentic and meaningful learning, where they will contribute their own views and ideas, experience
leadership and input into decision-making, and develop personal and social responsibility for their actions.

Environmental education was seen as a tool for achieving all of these aims.

Steps 3–5 seemed to be important in the stocktake and case study schools, but were also identified as areas where more time/support may be needed (see the response to research question 6 below). Two points were raised regarding Step 6. Some teachers felt their involvement in environmental education helped them to develop new strategies that were extremely successful in promoting student enjoyment and satisfaction in learning; other teachers felt they needed more professional development in both pedagogy and knowledge to enhance their environmental education programmes. Environmental agencies and regional and local councils were seen as extremely useful for sourcing resources (Step 7), although many teachers in the stocktake and the case study schools wanted more resources and environmental education teaching ideas.

Of all the planning steps, Step 8 was the least evident. Staff in the case study schools could articulate what their environmental education aims/goals for students were, and some thought carefully about how such outcomes could be achieved through teaching practice. However, evaluation of students’ learning outcomes or achievements as a result of environmental education was generally anecdotal, based on teachers’ observations of students’ pride, motivation, enthusiasm, and desire to share their environmental education successes with the wider community. Intended environmental education student outcomes were sometimes included in curriculum planning (for example, see the curriculum plans used by a teacher at Kamo Intermediate, Volume 4). However, many teachers said they would like more rigorous evaluation and monitoring of students’ environmental education learning/outcomes, in order to “justify” student learning but also as a way to improve schools’ environmental education programmes and practices.

5. What kinds of student learning opportunities in environmental education occur as a result of the implementation processes undertaken by New Zealand schools?

The critical stocktake findings indicate that New Zealand teachers provide a range of student learning opportunities under the auspices of environmental education. Most (92 percent) of the units described by respondents involved activities “in” the environment (i.e., outside the classroom). This was usually on school grounds, although some students were involved in cleaning up the local environment, planting native trees or plants, monitoring the health of local waterways, and planting along the margins of these. New Zealand students appear to have opportunities to learn “about” the environment through a range of activities that include research projects, discussion with environmental sector professionals, community groups with an interest in the environment, and field trips.

In some instances, students had opportunities to present their environmental education learning to the class, school, their families, and the wider community. This was said to raise students’ or the school’s profile in the community. There was some evidence of student leadership, decision-making, and the input of students’ own ideas in relation to actions such as setting up recycling systems, or planning and planting gardens. Environmental education units with a focus on global
issues tended to involve students discussing or identifying strategies or solutions for environmental problems, with less evidence of students actually taking an action.

The case studies illustrated some rich examples of environmental education where student input, leadership, and decision-making were at the forefront of environmental education activities (for example, see those listed in response to research question 1). Students involved in these projects often described immense pride in their undertakings. Many felt they had learned more about the environment through involvement in these activities than they might have in a classroom. They also talked about learning how to actually “do” something—for example, how to:

- cultivate a garden, compost system, or a worm farm;
- develop landscaping plans;
- approach businesses, councils, or Boards of Trustees with a funding proposal;
- liaise with the media; or
- find ways to communicate an environmental message to the wider community.

For a handful of students at two of the case study schools, involvement in environmental education gave them the opportunity to go to international competitions or conferences on children and the environment. Environmental education offered students at the case study schools opportunities to learn in a very different way to normal teaching and learning practice. For example, students in the Year 12 NCEA “Sustainable Futures” class at Christchurch Girls’ High commented on how unusual it was to have a discussion-based teaching style, where they could contribute their own ideas and opinions, and have some input into what they would learn (and do) in their course. At Kura Kaupapa “A”, environmental education created an opportunity for students’ school learning to connect with their own and their school’s history/ancestry/whakapapa.

6. What kind of relationships exist between different environmental education services and programmes for schools, and what are the potential benefits for student learning of these relationships?

New Zealand environmental education is currently characterised by a range of relationships between agencies and schools. Some of these relationships have come about through central government initiatives (for example, Sustainable Organic School Gardens and the National Waterways project), some through local government initiatives (for example, Enviroschools, WaiCare, and other regional council environmental education programmes). Schools reported these programmes were particularly valuable as they often included readily usable resources that were suitable for students and teachers. They also provided a structure and a context for teaching environmental education. The advantage of these types of programmes for students was that they involved well-designed projects that provided education in, about, and for the environment, often set within a relevant local context. They allowed both teachers and students to access knowledge that may not reside within the school, and gave students opportunities to learn about the roles of particular agencies in relation to environmental issues.

Other relationships between agencies and schools have been initiated on an individual basis, often through personal relationships between a teacher and a member of an agency such as DOC. These have resulted in school-specific programmes that rely on the relationship between willing and
knowledgable individuals. The potential benefits to students of these school-specific relationships appear to equal those developed through the structured programmes. However, these relationships are at greater risk of unsustainability should either individual withdraw from the relationship.

Enhancement of structured relationships would increase the likelihood of student benefits from environmental education programmes. Respondents in the critical stocktake indicated that time to form relationships on an individual basis limited their programme development. They saw the need to develop better relationships with not only expert providers, but also with peers engaged in similar programmes. There was an indication that some form of central co-ordination of resources that included mechanisms to build beneficial relationships, and share ideas, would be of value to teachers.

7. What are the characteristics of the delivery of environmental education in the case study schools that support/do not support the goals of environmental education?

See responses to research questions 1–6.
KEY IMPLICATIONS OF THE RESEARCH

The three purposes for the Environmental Education in New Zealand Schools research were:

• to analyse environmental education practice in New Zealand schools to identify strengths and opportunities for future school practice, and to provide information that can be used to inform New Zealand schools’ environmental education programmes;

• to provide direction for the Ministry of Education and Government with respect to future initiatives in the planning, implementation, and evaluation of environmental education in New Zealand schools; and

• to facilitate further discussion between New Zealand policy-makers, researchers, and practitioners in environmental education about the way in which environmental education in schools is conceptualised, discussed, practised, and researched in New Zealand.

Implications from the research findings are reported here under four headings: implications for policy, implications for resourcing, implications for school practice, and implications for research.

Implications for policy

The visibility and status of environmental education

• If environmental education is to be a priority area in the New Zealand curriculum, the Ministry of Education should explicitly consider the visibility and status accorded to environmental education.

The research found that some teachers were concerned that, because environmental education was non-mandatory, it did not receive as much attention and resourcing as other parts of the curriculum. Whole school approaches might be supported by increasing the visibility and value accorded to environmental education, to encourage teachers to recognise it as a worthwhile addition/enhancement to the required curriculum\textsuperscript{12}.

Integration with the New Zealand Curriculum

• Environmental education in New Zealand schools would benefit from further consideration of the role of curriculum integration with respect to environmental education. For example, further explication or guidance on the purposes for integration, and the relationship between curriculum integration and the goals, aims, and characteristics of environmental education.

The research suggests that environmental education was integrated with the mandatory curriculum areas, either through integration within a single learning area, or integration across two or more learning areas. The stocktake suggests that some teachers saw integration as the only legitimate way of fitting environmental education into their existing curriculum requirements. In some

\textsuperscript{12} One way to achieve this could be to support some schools to develop as “centres of innovation” for environmental education. Similar centres have recently been established in the early childhood sector.
schools, environmental education was seen as a tool for promoting curriculum integration more widely within the school. Some teachers felt they needed more help/support for how to integrate environmental education into the curriculum.

**Communication of ideas, and awareness of the Guidelines and related initiatives**

- Environmental education in New Zealand schools would benefit from further strategies to support communication and dissemination of information about environmental education, including information about the Guidelines, and strategies to support networking and sharing of ideas and information about “effective” environmental education practice.

This is supported by the case studies which found that teachers often had limited awareness of the Guidelines until discovering them by chance or through attendance at an environmental education professional development session. The research found that raising teachers’ knowledge and awareness of environmental education programmes and services (and the Guidelines), particularly when supported by professional development, stimulated many schools to initiate major environmental education programmes. The stocktake also found that, even in schools identified as involved in environmental education, there were teachers who were not aware of the Guidelines.

**Building on initial professional development**

- Professional development for only one or two staff members in a school may be insufficient to enable environmental education practice to be sustainable. Consideration should be given to support for whole-school professional development which builds on the initial professional development of “key” environmental education teachers.

Whole school approaches to environmental education need the support and involvement of the whole staff. This is difficult to achieve when only some staff have an understanding of the aims of environmental education. School environmental education co-ordinators often suggested that whole staff professional development was needed so that their colleagues would be in a better position to support the school’s environmental education initiatives. The research found that some environmental education co-ordinators felt they needed more support (e.g., professional development or release time) to act as professional development providers for other staff in their schools.

**Co-ordination**

- Environmental education in New Zealand schools would be enhanced by a more co-ordinated approach to policy and programme development between the Ministry of Education, the Ministry for the Environment, and the Ministry of Research, Science, and Technology.

Better co-ordination in the development and delivery of programmes and resources to support environmental education would reduce duplication of effort, and reduce the difficulties some schools have encountered identifying sources of resources or support for their environmental education programmes. In several countries discussed in the review of international literature, this level of coordination helped in the transition from an “implementation” model of environmental education development, where the focus is on the development of policies, resources, and programmes to support environmental education, to a “process” model, where the goal is to create structures to support development of quality processes, dialogue, and professional development to enable those involved in environmental education to get the most benefit from existing environmental education resources, programmes, and people.
Implications for resourcing

The research findings suggest that resourcing for schools’ environmental education programmes is typically needed in the following areas:

- Resourcing to support environmental education teaching (e.g., release time for teachers’ own planning, school or departmental planning, and staff professional development).
- Resourcing to support whole class or whole school environmental education action projects (e.g., for equipment, travel, and materials).
- Resourcing to support sharing, liaison, and communication (e.g., with outside agencies and people, and within and between schools).
- Resourcing for student-initiated environmental action projects (i.e., not necessarily having to come through teachers).
- Resourcing to bring expert involvement in school environmental education programmes.
- It appears that attention is needed to enable sharing of ideas and knowledge between kura kaupapa Māori and other school types. A lack of Māori perspectives and input has been highlighted as a concern among environmental educators in New Zealand (see Volume 2: Bolstad and Baker, 2004, p. 44). Although several “mainstream” case study schools aimed to incorporate Māori knowledge and values in their environmental education, very few respondents in the stocktake indicated that this was the case. Seeing how environmental education occurs in kura kaupapa Māori contexts may assist “mainstream” schools to reconsider both the current role, and the potential role, of Māori knowledge and values in their environmental education (and other) school practices.

Implications for school practice

If schools wish to place a priority on environmental education, the research suggests the following important considerations.

- Some schools may need to re-evaluate the role of environmental education “for” the environment to ensure that student input and decision-making are central facets of the action process.
- Development of school policies for environmental education, and the formal incorporation of environmental education into school policy and planning documents, is important to reduce dependency on one or two individuals, and to secure long-term whole school commitment to environmental education.
- Whole school approaches with whole school commitment are best established when the principles underpinning the school’s environmental education are grounded in the school’s own culture, values, and philosophies.
- Activities such as gardening, planting, waste management, and other activities in or near the school grounds appear to develop students’ sense of pride, ownership, and respect for their immediate environment. Activities that render tangible physical changes to the environment enable students to see evidence of the difference their actions have made, and can raise support from parents and the community.
Further issues for consideration for schools are:

- To evaluate whether environmental education teaching practices promote long-term learning value for students (i.e., whether they act to develop students’ “action competence” and ability to be decision-makers with regard to environmental issues in the present and the future).
- To find ways to evaluate or assess in the “short term” that students are developing knowledge, skills, attitudes, values, and abilities to take action.
- To design sustainable long-term environmental education programmes or projects that can involve successive cohorts of students over time.
- To reconsider what environmental education means at different ages or levels, what sort of knowledge, actions, responsibility, and leadership students might take at different ages or levels.
- To identify school-based structures that constrain or complicate environmental education practice (e.g., timetabling issues, existing subject divisions, existing planning or assessment practices), and determine school-wide strategies for changing, modifying, or working around these structures.

**Implications for research**

This research lends general support for the notion that environmental education is most sustainable in the context of whole school approaches, where environmental education is infused across multiple layers of school activity, and becomes embedded in the school culture, rather than being dependent on the efforts of one or a few committed individuals. Prior to this research, there was only a small amount of formal research on environmental education practice in New Zealand.

There are still many specific areas where little is known. For example:

- What changes and pathways are evident in schools’ involvement in environmental education over time?
- What are effective ways to support New Zealand schools to develop environmental education programmes and practices that are sustainable in the long term?
- What are appropriate or effective approaches to environmental education for students of different ages and different levels of schooling?
- What are the short-term and long-term impacts or outcomes of students’ involvement in environmental education, and how can these best be evaluated?

The form and purpose of future research in environmental education would benefit from further discussion and collaboration between New Zealand schools, researchers, policymakers, and environmental education stakeholders.\(^{13}\)

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\(^{13}\) A reviewer of an earlier draft of this research commented: “Although [further research in environmental education is needed] we need to be clear about the purpose of research. Who needs it, what for and in what form is it most useful to them. The lack of formal (for want of a better term) research may in part point to a need for an informal system that allows all EE participants to contribute to the pool of knowledge (about EE and sustainable schools).
and have access to it. Although there is little recorded research on EE in New Zealand, personal experience tells me that there is a huge wealth of knowledge contained in the experiences and stories of students, teachers, facilitators, government and non-government agencies. Conventional methods of evaluation or research seem to tend towards surveys and long written reports that are inaccessible to most participants and focus on gathering rather than disseminating information. There is a need for a process that is accessible and useful and enables a diversity of knowledge to be shared and built upon.”
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