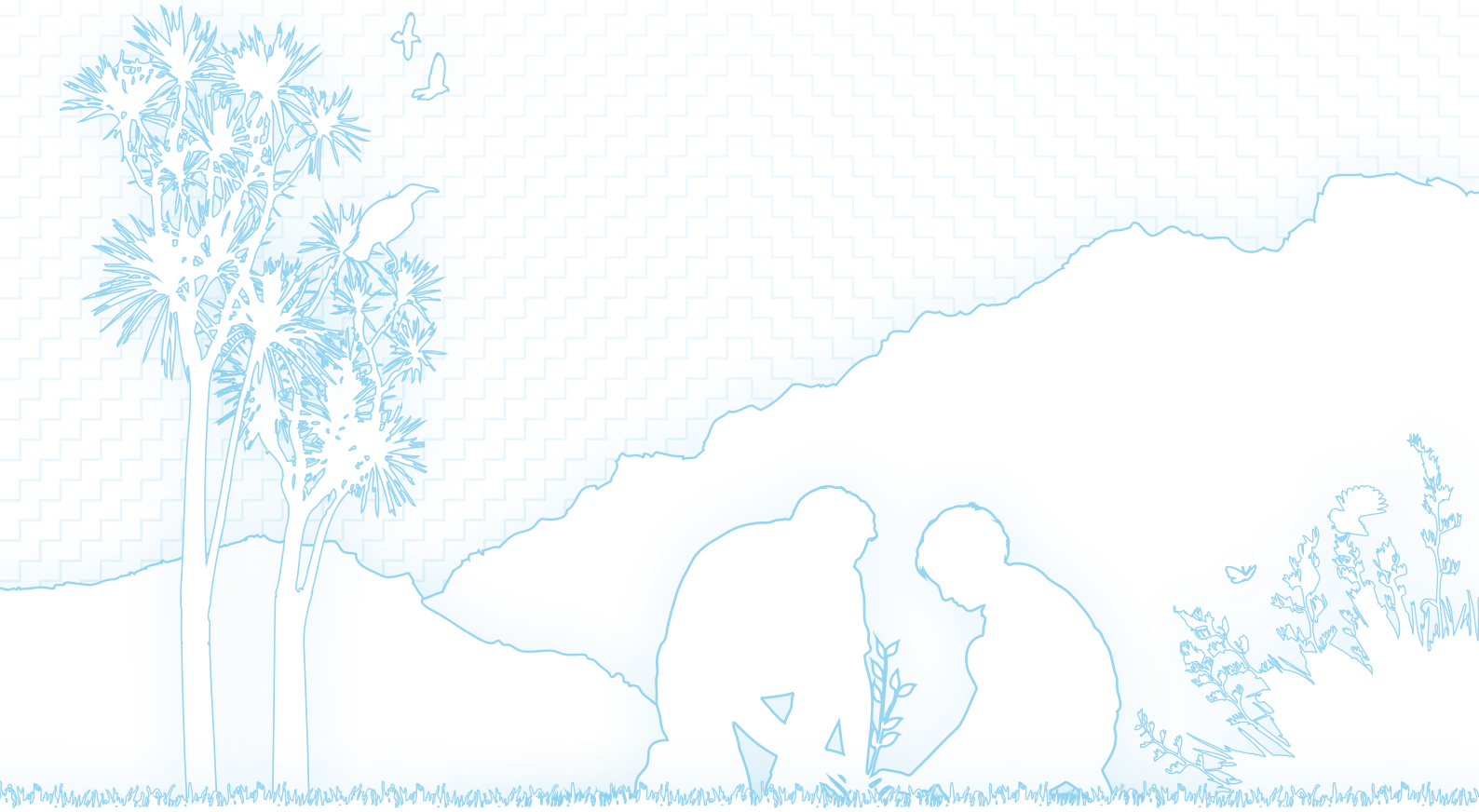
Environmental education in New Zealand schools

Research update 2015

Rachel Bolstad, Chris Joyce, and Rosemary Hipkins



New Zealand Government

NZCER
Rangahau Mātauranga o Aotearoa

Environmental education in New Zealand schools

Research update 2015

Rachel Bolstad, Chris Joyce, and Rosemary Hipkins

New Zealand Council for Educational Research
P O Box 3237
Wellington
New Zealand
www.nzcer.org.nz

ISBN 978-1-927231-64-7

Acknowledgements

The research team would like to thank everyone who contributed to this research, including the workshop participants and the Advancing EE Steering Group for the valuable contributions to and feedback on this report. We would especially like to thank: Jenny Ritchie, Sandy Bell-Jameson, Michelle White, Bridget Glasgow, Jocelyn Papprill, Sally Birdsall, Heidi Mardon, Glynne Mackey, David Mules, Sasha Matthewman, Pam Crisp, Gill Stewart, Jan Cox, Ally Bull, Chris Arcus, Micheline Evans, Ellen Hampson, David Irwin, Chris Duggan, Sian Carvell, Andrea Taylor, Toni Watts, Matthew Stanford, Mark Oster, Andrew Innes, Hilary Chidlow, Hilary Iles, Kerryn Penny, Heidi Mardon, Chris Eames, Davina Hunt, Sandra Cubitt, Ben O'Meara, Mike Mendonca, and Sarah Murray.

Table of contents

Tables

Appendices

Executive summary

This report seeks to update the findings from a large multi-method study of environmental education (EE) in New Zealand schools just over a decade ago (2002–3). The 2015 update involved two areas for new data collection: literature on New Zealand environmental education published since the original study, and three research workshops with a selection of key people knowledgeable about current EE practice and developments over the past decade.

A key challenge for any research in this area stems from the cross-curricular nature of EE as a context for learning: EE could occur anywhere in the curriculum, involving learners at any level of schooling or early childhood education (ECE). This study addressed that challenge by seeking out some identifiable "hotspots" for EE activity, and seeking insights from people who have been heavily involved in research or practice across schools, ECE, and tertiary EE over the past decade. While the information gathered for this research update can only provide a partial picture of current EE practices in New Zealand, we present it as an initial analysis that could be built on in collaboration with key cross-sectoral stakeholders.

Key messages for understanding EE from a system level

- EE is inherently cross-sectoral, involves multiple diverse stakeholders, and connects with wider national and global interests in the relationship between humans and the natural world. In seeking to advance EE it is therefore important to look at the relationships between the key government sectors that provide support for EE, and how this connects with regional government and non-governmental (including business and community sector) support for EE, and the contributions each can make to the shared goals of advancing EE.
- EE practice in schools and early childhood settings is often situated within a web of other national and localised connections including local government, community providers, businesses, charitable foundations, and other people and groups connected with specific natural environments, natural sciences, and environment- and conservation-focused projects and programmes. These diverse stakeholders have various reasons for seeking to engage young people with the environment, and provide support for EE practice in a variety of ways including financial resources, project opportunities, knowledge and expertise in environmental and conservation contexts, teaching resources, mentoring and facilitation, and connections and networks.
- Towards the end of the 20th century there was a "re-orientation" of EE in the direction of education for sustainability (EfS). This was a major development period for EE/EfS theory, practice, and research and laid the foundation for some of the practices we see in New

Zealand education today. However, the growth of research and practice knowledge over the past two decades has not necessarily led to consistent understandings about, and approaches to, EE/EfS across all schools and early childhood settings.

- *The New Zealand Curriculum* (NZC) and its antecedents give mixed signals about the priority schools should give to EE/EfS within and across their teaching programmes. The diffuse positioning of EE/EfS in New Zealand's national curriculum is not unusual by international standards, although the national curricula in some countries give schools a more explicit mandate for building EE/EfS into school programmes.
- In other countries, EE/EfS typically evolves 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 (note that this does not necessarily lead to EE being "mandatory").
  - Second, there is a "resource development, programmes and initiatives" stage, where central and regional agencies, non-governmental organisations, and other stakeholders in environmental education develop a wide array of teaching resources, services, and programmes to support environmental education in schools.
  - Finally, some countries move into a third stage: "coordination", where the emphasis is on coordination of existing resources, programmes, and services, and on enhancing the quality of support for schools and early childhood settings to make good use of these. Our analysis suggests that New Zealand hovers around the edge of this third stage.

What strategies have been used to advance EE in New Zealand?

The activities that have been undertaken to establish and sustain EE/EfS practice in New Zealand schools and early childhood settings over the past few decades have included various efforts to:

- identify how EE/EfS aligns with the intentions of the national **curriculum** and how it can be expressed in school-based curriculum, teaching, and learning
- develop EE/EfS **understanding and capability** within schools and early childhood settings, and amongst the teaching profession (pre-service and inservice)
- build and effectively disseminate **EE/EfS practice knowledge** to assist continuous development and spread of EE/EfS knowledge and practice within and across schools and early childhood settings
- establish and sustain **networks and partnerships** that support learners' and teachers' access to knowledge, resources, environments and contexts for EE/EfS
- develop a more coherent and **coordinated central policy framework**, aligning across Ministry of Education, Ministry for the Environment, and Department of Conservation priorities to support and give direction to EE/EfS.

This research update indicates that while there have been many pockets of progress and development across all of these areas over the past 11 years, this progress is unevenly spread and has often lacked high-level coordination.

There is also evidence of recurring challenges that stem from the inherently complex nature of the endeavour. Is it clear how we can most effectively shape meaningful EE/EfS learning experiences and pathways for learners across formal education systems? There does not seem to be a straightforward answer to this question. While everyone seems to agree that EE/EfS is important, environmental sustainability challenges are some of the most complex challenges of our time. Questions about how we understand human relationships to the environment, and how societies should use natural systems to appropriately balance current and future needs, can be contentious. Because the wider context for EE/EfS (in society) is complex, so are the challenges for how to address them in education settings.

Our analysis of data from the new literature and workshop discussions suggests a mixed picture of successes and challenges for EE today. Findings include:

- continued growth in the Enviroschools network, and consistent/growing demand for Enviroschools and other structures to support school-based practices
- a growth in partnerships with NGOs, foundations, and businesses
- notable energy around EE/EfS in New Zealand early childhood education
- the emergence of research and practice around place-based pedagogies and calls for reconceptualising education "in" the environment (outdoor education)
- opportunities and challenges associated with EfS and the NCEA
- opportunities and challenges for realising the potential for EE/EfS in *The New Zealand Curriculum*
- increased visibility of innovation, whole-community projects, long-term projects
- challenges in funding and support for roles that facilitate and support schools and early childhood settings' access and use of EE/EfS opportunities (churn in the professional networks that support schools and early childhood settings' EE/EfS practice)

In the long term, a sustained policy interest in supporting and evaluating developments in EE/EfS over time could include more regular opportunities for lateral sharing of practice knowledge across and between sectors.

We conclude that there is now a substantive body of published knowledge (research and teacher resources) that is relevant for supporting New Zealand teachers to develop EE/EfS practice. There is also a substantive amount of practice knowledge distributed amongst teachers, facilitators, and learners who have had opportunities to work in EE/EfS, and evidence that this practice knowledge is being shared laterally across and between some schools and early childhood settings where possible. However, challenges for continuing to advance EE/EfS across the system are:

- how to ensure that teachers across all year levels and areas of the curriculum can effectively access and utilise this knowledge* in order to integrate EE/EfS into school curriculum and practice in ways that are locally responsive to the needs and contexts of their learners and communities and help to realise the intentions of the NZC,** *Te Marautanga o Aotearoa*, and *Te Whāriki.*
- how to monitor and evaluate progress in efforts to advance EE, given the cross-curricular nature of EE/EfS, the decentralised nature of school curriculum design and implementation, and the complex question of whether or how to most appropriately monitor New Zealand students' learning opportunities and learning gains in EE/EfS over time.
- how to determine equity of access and opportunity for EE/EfS that is engaging and meaningful for all learners across the system.
- how to share responsibilities and coordinate work across key stakeholder domains to maximise the effectiveness and impact of this work in supporting EE/EfS in schools and early childhood settings.

Our recommendation is to frame next steps in terms of a goal of building a more connected, future-oriented EE/EfS system. A key message here is the need to take a whole-system perspective, bring together relevant stakeholders to consider what each can contribute to the collective challenge of advancing EE, set shared goals to work towards, and form agreed indicators of what "success" looks like in terms of strengthening EE/EfS across the system. Key learnings from similar work to strengthen science education across the system may be useful in this process.

---

* And generate and share new practice knowledge.

** For example, ensuring that EE/EfS approaches maximise learners' opportunities to develop as "confident, connected and actively involved" learners who are, "connected to the land and environment", "participants in a range of life contexts", "contributors to the well-being of New Zealand—social, cultural, economic, and environmental" and other key aspirations of NZC.

1. Introduction

The Ministry of Education (MoE), the Department of Conservation (DOC) and the Ministry for the Environment (MfE) are working together to advance environmental education (EE) in New Zealand. They have agreed on a number of actions to actively engage young people in environmental education, one of which is to evaluate the current state of conservation/environmental education in New Zealand to identify barriers and opportunities for supporting environmental education in schools.

In moving forward, it is important to build from what is already known. Just over a decade ago (in 2002–3) the New Zealand Council for Educational Research (NZCER) and the University of Waikato were contracted by the Ministry of Education to undertake research into environmental education in New Zealand schools. The research included three components: a literature review referencing over 165 published documents, a critical stocktake (survey) of nearly 200 schools involved in environmental education, and case studies of environmental education practices in eight schools and kura. At the time, the study represented a significant drawing together of knowledge about the past, present, and possible future directions for school-based EE. The findings were published in four volumes of research in 2004.[1]

In early 2015, NZCER was asked to provide an update to the original piece of research. Much has changed in the 11 years since the first project was undertaken. To provide a focused, cost-effective, and timely piece of work it was agreed that rather than reprise the full methodology used in the earlier study, the update would comprise two focused approaches for new data collection:

- preparation of an annotated bibliography of new literature on New Zealand environmental education published since the 2004 review
- convening half-day workshops in Wellington, Hamilton, and Christchurch with a small sample of key people heavily connected with environmental education research and practice in New Zealand schools, tertiary, and early childhood education, to canvass their knowledge about current practice and developments in the sector since the original piece of research was undertaken.

This report draws together key findings from the two data sources to provide a high-level summary of new information about the current landscape for environmental education for young New Zealanders, focusing on the opportunities and challenges for continuing to improve and

[1] See Bolstad and Baker, 2004; Bolstad, Cowie, & Eames, 2004; Bolstad, Eames, Cowie, Edwards, and Rogers, 2004; Cowie, Eames, Harlow, and Bolstad, 2004.

support EE. The update draws primarily on new literature, along with information from key participants who have been closely engaged with policy and practice development in this field over the period covered by this update. We also comment on the limitations of this update report (see Chapter 2) and recommendations for further research and strategy work to build from this report (see Chapter 6).

A note about terminology

This report uses the terms environmental education (EE) and education for sustainability (EfS) to reflect the currency of both terms in New Zealand practice. However, it should be noted that each term has particular histories and connotations and may lead to different approaches to shaping students' learning opportunities. For example, EE can connote a broad range of student learning activities in, about, and for "the environment", often with an emphasis on students' interactions with and understanding of the biophysical environment. Education for sustainability tends to signal a more integrative, critical educational approach that additionally focuses on the social, economic, cultural, and political patterns and contexts that shape human interactions with the biophysical environment, and foregrounds the goal of critically informed action as an outcome of EfS. While these distinctions are important, the terminology itself can be and often is used fluidly. The significance of the terminology and how it has related to evolving EE/EfS practices over time in New Zealand schools and early childhood settings is discussed further in Chapter 3.

2. Methodology for the update

The research update was compiled between February and May 2015. The methodology for the two key research activities is described below.

Preparation of annotated bibliography

We used Endnote to construct a repository for new research, commentaries, and other relevant literature on EE in New Zealand published since the 2002–3 study. The searchable Endnote library file generated for this project is presented alongside this report so that details for each of the entries can be viewed. The library itself can also be updated over time.

Search parameters

We searched for papers and articles published since the 2002–3 study, focusing almost exclusively on New Zealand-based publications, and early childhood, primary and secondary sectors, as well as pre-service teacher training. These searches picked up published research, as well as "grey literature"—for example, descriptive articles about specific examples of what is happening in schools and early childhood settings (e.g., in the Education Gazette), and reports and information from organisations such as the Department of Conservation and Enviroschools.

We began our search with a range of sources that included Google Scholar, the New Zealand Educational Theses Database, the New Zealand Council for Educational Research's research papers, Ministry of Education research reports, various journals for environmental educators and researchers (e.g., *New Zealand Education Gazette; New Zealand Science Teacher; Environmental Education Research; Australian Journal of Environmental Education; set: Research for Teachers;* and *Physical Educator—Journal of Physical Education New Zealand).* We used a snowballing process to build lateral connections from the papers we found. Other publications were suggested by participants in the workshops and other people in the EE sector spoken to during the research period.

To keep the project within time and budget scope, we used our judgement to select the most relevant and accessible literature for inclusion in the Endnote file.

Search terms and keywords

Building from the key search terms used to locate papers, we built a typology of keywords to enter into the Endnote file so that it can function as a searchable database. First-tier search terms were derived from different focuses of environmental education. Some further search terms were added to cover aspects of teaching and learning such as school levels, pedagogy, and relevant aspects of *The New Zealand Curriculum*. The full list of keywords used in the Endnote library is given in Appendix 1.

The Endnote file

For each entry a short summary of the research, evaluation or commentary was entered in the "Notes" field in Endnote. The summaries are tailored to the areas of interest for this research update, so they do not necessarily include all of the findings or recommendations from a particular piece of work. Each summary was structured under one or more of the following three questions—"What is happening [in EE]?", "What has changed [since 2002–3]?" and "What needs to change [to advance EE]?" These headings can also be used to filter items within the searchable Endnote library.

Half-day research workshops

We convened three half-day workshops with small groups of key contacts working in EE/EfS. Potential participants were identified through NZCER's existing professional contacts, and a "snowballing" methodology was used to pick up other recommended contacts from those networks. We also sought recommendations from the Ministry of Education, Ministry for the Environment, and Department of Conservation and contacted people identified through our searches of recent New Zealand literature. Potential participants were sent an information letter and consent form (Appendix 2). There was a very positive response from those who were contacted and most participants who were able to make the workshop dates agreed to take part in the project.

The workshops were convened in Wellington (11 participants), Hamilton (8 participants), and Christchurch (13 participants), with some participants travelling to the workshops from other cities. The 32 participants included primary and secondary teachers, university researchers, facilitators and educators from local and regional councils, LEOTC providers, and voluntary/community organisers. We sought participants who could comment on what they have seen across many schools and/or early childhood settings. For a variety of reasons, including timing of workshops and teaching schedules, some teacher participants who were keen to take part could not attend on the days, so most participants were EE/EfS facilitators, researchers, teacher educators, or EE/EfS programme managers. Participants' affiliations included the following organisations: primary and secondary schools, Ministry of Education, Enviroschools,

Department of Conservation, New Zealand Association of Environmental Educators (NZAEE), Ministry for the Environment, the University of Waikato, the University of Auckland, Victoria University of Wellington, Auckland Council, Reconnecting Northland, Christchurch City Council, Environment Canterbury, Environment Southland, Christchurch Polytechnic Institute of Technology, University of Canterbury, and EcoOtago.

The workshops were built around a qualitative methodology called "mediated conversations"(Cowie & Hipkins, 2014) in which participants are invited to bring stories and artefacts from their work to share with the other participants, and small group conversations are mediated (focused) by what the participants bring to share. This methodology ensures that conversations, while guided by the intentions of the research, are grounded in the realities of participants' work. Researchers observe and record, and then build on these preliminary conversations, to co-construct insights pertinent to the research questions. This method is particularly suited to research in dynamic practice contexts because the researchers find out how the practitioners understand and work with the constructs being explored while simultaneously building common ground to move these understandings forward.[2] For this reason, participants typically experience mediated conversations as rich professional learning and networking, in addition to serving a useful research purpose.

At the conclusion of each workshop, participants were asked to reflect individually or collectively on four key questions (Table 1) and provide written responses for the research team to collect.

Table 1 **Reflection questions for workshop participants**

Thinking about the EE stories/examples/programmes/practices that we have heard today:
1. How widespread or typical are the approaches and practices we have heard about today? *(Please add any comments you think are important for us to gather)*
2. Where are the gaps—what have we missed ? *(What else do we need to look at?)*
3. Looking to the future—what are the critical issues and key needs for supporting EE in New Zealand schools?
4. What's different compared with ten years ago? *(What's significantly changed, what's not, what is important to notice about the past decade of EE?)*

Limitations of the study

The information gathered for this research update can only provide a partial picture of current EE practice in New Zealand. One key challenge for any research in this area stems from the cross-curricular nature of EE as a context for learning: EE could occur anywhere in the curriculum, involving learners at any level of schooling or early childhood education. Practices could involve

[2] For a recent example that used the same methodology, see the report for the Ministry of Education that scoped challenges of assessing New Zealand secondary students' international capabilities http://www.educationcounts.govt.nz/publications/schooling/144533

whole schools or single classrooms, could be occurring within or outside schools, in the classroom curriculum or in co-curricular activities, and could engage learners in a variety of different programmes supported or facilitated by different external providers. Any research that seeks to draw out a national picture of current practice will only be able to uncover and examine some areas of activity, while undoubtedly missing others. This was true even with the more comprehensive data collection approach used in the 2002–3 research.

The methodology for this study addressed this challenge by seeking out some identifiable "hotspots" for EE/EfS activity from which to draw out current practice knowledge. However, as one participant in the 2015 workshops commented "there is a lot of awesome stuff [going on] that is under the radar". Similarly, this update provides more information about the *presence* of EE/EfS practices in schools and early childhood settings than its absence. Another workshop participant suggested the important questions to ask here are:

> Where is EE *not* happening? What's the difference between schools where it's working well and schools where it's not? What role can people working in EE play in supporting it to happen more effectively? (Workshop participant, Enviroschools facilitator)

The data gathered in this update provides some insights but cannot provide quantifiable information on these questions. The literature and workshops also surfaced insights and questions about what constitutes quality EE/EfS practice, and what this looks like across such diverse contexts (school levels, curriculum areas, contextual focuses, and so on). Recent practice-based examples from the literature and workshops are discussed in Chapter 5.

In the long term, a sustained policy interest in supporting and evaluating developments in EE/EfS over time could include more regular opportunities for lateral sharing of practice knowledge across the sector. Based on our experiences compiling the 2002–3 research and this research update, we suggest this could provide a cost-effective and practical supplement to the growing body of published research knowledge and other documented information about current practices.

3. Four key messages from the 2002–3 research

This chapter recaps four high-level messages from the 2002–3 research still relevant to understanding general issues and opportunities for EE today. These are described below and discussed in more detail through the chapter.

1. EE is inherently cross-sectoral, involves multiple diverse stakeholders, and connects with wider national and global interests in the relationship between humans and the natural world. In seeking to advance EE it is therefore important to look at the relationships between the key government sectors that provide support for EE (notably education, environment, and conservation) as well as how this connects with regional government and non-governmental (including business and community sector) support for EE.
2. Towards the end of the 20th century there was a "re-orientation" of EE in the direction of education for sustainability (EfS). This was a major development period for EE/EfS theory, practice, and research and laid the foundation for some of the practices we see in New Zealand education today.[3] However the growth of research and practice knowledge over the last two decades has not necessarily led to consistent understandings about, and approaches to, EE/EfS across all schools and early childhood settings.
3. *The New Zealand Curriculum* (Ministry of Education, 2007) and its antecedents[4] give mixed signals about the priority schools should give to EE/EfS within and across their teaching programmes.[5] The diffuse positioning of EE/EfS in New Zealand's national curriculum is not unusual by international standards, although the national curricula in some countries give schools a more explicit mandate for building EE/EfS into school programmes.
4. In other countries,[6] EE/EfS typically evolves 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.[7] Second, there is a "resource development, programmes and

---

[3] The caveat is that these practices are not necessarily consistently present across all New Zealand schooling. This will be discussed further in Chapter 5.

[4] *The New Zealand Curriculum Framework* (Ministry of Education, 1993).

[5] This could also be said of other aspects of the curriculum that are intended to *thread across* all learning areas (Hipkins, 2013).

[6] The 2002–2003 research included a comparative analysis of literature from six countries: Austria, the Netherlands, Norway, Australia, England, and the United States.

[7] Note that the "mandating" stage does not necessarily result in decisions to make EE/EfS "mandatory". Different countries have taken different approaches.

initiatives" stage, where central and regional agencies, non-governmental organisations (NGOs), and other stakeholders in environmental education develop a wide array of teaching resources, services, and programmes to support environmental education in schools and early childhood settings. Finally, some countries move into a third stage: "coordination", where the emphasis is on coordination of existing resources, programmes, and services, and on enhancing the quality of support for schools and early childhood settings to make good use of these. The 2002–3 research and subsequent update data suggests that New Zealand hovers around the edge of this third stage.

Unpacking the four key messages

Why is it important to look at policy, practice, and developments both *inside* and *outside* the education sector?

EE is inherently cross-sectoral and connected with wider national and global interests in the relationship between humans and the natural world. Contemporary environmental education began to emerge from global environmental concerns in the 1960s and 1970s, notably a series of international summits and declarations which heralded changing international concerns about the environment.[8] While these concerns stemmed from a science base, the international community began to recognise that rather than addressing environmental issues in isolation, a more integrated philosophy of addressing economic and social development alongside environmental issues was needed to promote long-term environmental, economic, and social sustainability.

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 environment, rather than ministries of education, and environmental education policy development focused on integrating environmental education across all community sectors.

The 2002–3 literature review (Bolstad & Baker, 2004) outlined how cross-governmental drivers for EE played out in New Zealand, with strategic leadership for EE/EfS emerging in various ways from the Ministry for the Environment, the Ministry of Education, and the Department of Conservation, with some coordination across ministries.[9] The current commitment from all three of these central agencies to undertake actions to advance EE suggests an ongoing effort to align priorities and coordinate current work programmes to this effect.

---

[8] These include the United Nations Conference on the Human Environment (1972), the Intergovernmental Conference on Environmental Education (1977), the Rio Earth Summit (1992), and subsequent mega-summits on sustainable development (e.g., Rio 2012).

[9] See Bolstad and Baker (2004), pp. 28–35.

As well as connecting across different central government policy sectors, EE practice in schools and early childhood settings is often situated within a web of other national and localised connections including local government, community providers, businesses, charitable foundations, and other people and groups connected with specific natural environments, natural sciences, and environment- and conservation-focused projects and programmes. These diverse stakeholders have various reasons for seeking to engage young people with the environment, and provide support for EE practice in a variety of ways including financial resources, project opportunities, knowledge and expertise in environmental and conservation contexts, teaching resources, facilitation, and connections and networks.

One additional point to note is that diverse stakeholder interests in EE/EfS may flow from a mixture of different discourses and ideas about young people and the environment. For example, while some stakeholders' interests are tied to particular environmental, sustainability, or science learning goals, other stakeholders may also have a commitment or interest in the empowerment and development of young people as active citizens, leaders, and contributors to decision making in matters that affect them (or their futures). Still other discourses position young people in terms of their current and future consumption and consumer choices, or as future participants in the workforce. EE/EfS is an area in which these different discourses frequently intersect, particularly around the notion of developing students' capabilities to make informed decisions and take actions in relation to environment and sustainability challenges now and into the future.

One challenge for EE/EfS is the potential for tensions and disagreements to arise from the intersection of these different discourses (Mueller & Tippins, 2015). Different groups may have different ideas about what "good" EE/EfS looks like, and what sorts of long-term goals and potential outcomes should be aimed for. This is natural, because people have very different views on many matters, including humans' relationship to the environment, how society and the economy should grow and develop, and education's role in (re)producing or transforming society (Bolstad, Roberts, & McDowall, 2009). It is beyond the scope of this review to unpack these discourses in detail, except to note that they are discussed extensively across the EE/EfS literature. A second comment we will make is that some of the deeper theoretical discourses that underpin youth citizenship and development may be less familiar in formal educational sector discourses about learners and learning. This may be because formal education systems have *traditionally* tended to focus more on learners' knowledge-acquisition goals and less on active citizenship and youth development goals. The latter goals also have the potential to be disruptive as they can involve learning to challenge existing power relationships and how power is shared, for example between children/young people and adults, or between people and groups who have different access to power and authority in society. The challenge of ensuring children and young people consistently have access to participation in decision making, and that decisions and action-taking are suitably well-informed by knowledge, often surfaced as a theme in the literature and workshop conversations in relation to the EE/EfS goal of young people "taking action" as part of their learning (see Chapter 5).

The cross-sectoral, multiple-stakeholder nature of EE is one of its defining characteristics.[10] The information gathered in this research update suggests that efforts to advance EE in schools and early childhood settings should seek to effectively leverage off these existing relationships and connections. This leaves open the question of which specific activities fall within the remit of each policy sector, and how joint responsibilities for EE advancement can be most effectively managed between central government and other key stakeholders and supporters of EE/EfS.

What underpinned the "re-orientation" of EE towards EfS?

Through the 1990s and early 2000s, the literature indicates that in many countries environmental education remained at the margins of mainstream schooling, competing with other priorities.[11] Through the final decades of the 20th century, researchers and theorists in environmental education began to examine the *reasons* environmental education was apparently not being integrated into mainstream education in systematic and system-level ways, and how schools might deal with the inherent challenges that environmental education raised for conventional approaches to curriculum and pedagogy. Researchers and theorists sought to articulate and define the aims and characteristics of environmental education within a framework of *educational* theory, leading to a body of literature which articulated in some depth the goals and characteristics of the "new" environmental education (usually referred to as environmental education for a sustainable future (EEFS), and their implications for school-based practice. (e.g., see Elliot, 1994, 1995, 1999a, 1999b; Fien, 2000; Fien & Greenall Gough, 1996; Fien & Tilbury, 1996; Gough, 1997; B.B. Jensen, Schnack, & Simovska, 2000; Scott, Bruun Jensen, & Pereira, 1998; Scott & Reid, 1998; Tilbury, 1995, 2001). Authors such as Tilbury (1995) defined EE/EfS as being:

- relevant
- holistic
- values-orientated
- issues-based
- action-orientated
- critical education.

The "action-orientated" aspect has arguably been the most widely accepted of these six characteristics, perhaps because it easily aligned with existing traditions of students getting hands-on in the care of natural environments (litter clean-ups, tree-planting, and so on). Since the 1990s, it has often been said 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".[12] The concept was widely adopted within the

[10] The 2002–2003 literature review illustrated this through a description of EE development in New Zealand and a selection of other countries (R Bolstad & Baker, 2004).

[11] Though EE was occurring in a range of forms at the level of individual schools and classes.

[12] Other authors (Ahlberg, 2003) attribute "in-about-for" to an earlier paper on outdoor education (Donaldson & Donaldson, 1958).

environmental education literature and is visible in New Zealand EE/EfS literature (Ministry of Education, 1999).

What is 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 & Greenall Gough, 1996). Fien (1994) located 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. 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",[13] and "action competence" (B. B. Jensen & Schnack, 1997), became part of the common theoretical frameworks in contemporary environmental education literature through the 1990s and early 2000s.

The action-oriented dimensions of EE/EfS ("action competence" and "education for the environment") were picked up strongly in the New Zealand EE/EfS community, and have been further developed and interrogated through several cycles of New Zealand practice-based research (e.g. Arthur, 2011; Birdsall, 2011; Biss, 2012; Eames, Barker, Wilson-Hill, & Law, 2010; Wake, 2010). The new knowledge developed in this area will be discussed in Chapter 5.

Where does EE/EfS fit in *The New Zealand Curriculum*?

EE/EfS has always been positioned as cross-curricular in New Zealand's national school curriculum, with some clear affinities to particular learning areas (e.g., science, social science), and the potential to integrate within and across *any* of the learning areas. The 2002–3 research outlined the history for this cross-curricular positioning, which at that time was framed by *The New Zealand Curriculum Framework* (Ministry of Education, 1993) and the seven learning area

[13] 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).

documents published between 1991 and 2000.[14] In 1999 the Ministry published the *Guidelines for Environmental Education in New Zealand Schools* (Ministry of Education, 1999), providing schools with additional guidance about how to design and implement EE across the school curriculum. However, the critical stocktake survey of EE undertaken in 2002–3 noted that half the teachers who responded to the survey were either unaware of, or unfamiliar with, this document (Cowie et al., 2004).

The most important curriculum developments since the 2002–3 research have been the introduction of *The New Zealand Curriculum* (Ministry of Education, 2007) and *Te Marautanga o Aotearoa* (Ministry of Education, 2008). Many researchers and practitioners in EE/EfS consider that *NZC* provides a stronger message and greater potential for inclusion of EE/EfS in schools than the previous curriculum, particularly because it presents sustainability as a theme within the "future-focus" principle, includes environment and sustainability ideas in the values and vision statements, and encourages schools to engage in their own curriculum design (Eames, Roberts, Cooper, & Hipkins, 2010). As with the curriculum documents of the 1990s, there are many direct and indirect references to human relationships with the environment within each of the learning area essence statements. The new curriculum has also supported a range of overall shifts in practice in schools that have the potential to enhance schools' current capability to integrate EE/EfS within and across the school curriculum. These include general pedagogical and curriculum developments around the "front end" of the *NZC* (vision, values, key competencies, the future-focused principle, the emphasis on inquiry learning—and teaching as inquiry—and support for schools to develop curriculum coherence).[15]

Support for the seven learning areas in the *NZC* may have also provided additional opportunities for enhancing EE/EfS, though a full analysis of recent curriculum support in the learning areas is beyond the scope of this research update. We also note that each of the learning areas have differing philosophical underpinnings that provide different kinds of alignments with the intentions of EfS. For example, the health and physical education learning area has particularly strong conceptual hooks on which to hang the socially-critical action-taking focus of EfS, both through its four underlying concepts, and its fourth strand, "healthy communities and

---

[14] In 1991, a draft version of the *New Zealand Curriculum Framework* included a proposed learning area called "Science and the Environment". However, when the *New Zealand Curriculum Framework* was released in 1993, environmental education had been separated from science education. "Science and the Environment" became *Science in the New Zealand Curriculum* (Ministry of Education, 1993), and environmental education did not appear as one of the seven curriculum learning areas. The absence of a discrete learning area for environmental education in the curriculum reflected a debate at the time over whether environmental education should be a stand-alone learning area, or whether it would be most effective when infused across the curriculum (Barker, 2001). New Zealand's curriculum took the latter approach. However, direct references to the environment occurred in several essential learning areas, particularly science, social studies, and technology.

[15] We should note that this update report draws mainly from data sources about EE/EfS in English-medium schools and early childhood centres. We are not able to provide equivalent commentary about the impact of Te Marautanga o Aotearoa implementation on EE/EfS in Māori medium contexts. The gap in this update around EE/EfS in kura and hāpori is discussed further in Chapter 5.

environments", in which "students contribute to healthy communities and environments by taking responsible and critical action" (Ministry of Education, 2007, p. 22). Chapter 5 looks at recent New Zealand literature on the integration of EfS and outdoor education.

In summary, although the *NZC* can provide an enabling framework to support EE/EfS, recent literature and practice-based knowledge suggest that, as in 2002–3, the degree to which these opportunities are taken up and realised in practice varies and is linked with factors including teachers' knowledge and confidence around EE/EfS, the degree of access to EE/EfS support and resources, the values and priority assigned to EE/EfS by teachers and by the school, and so on (see Chapter 5).

What about assessment?

The need for appropriate assessment practices to support and enable effective EE/EfS pedagogy has been a live issue, particularly in secondary schools, and particularly at NCEA level. We provide an updated view of EE/EfS assessment research and practice in Chapter 4.

Why is coordination important?

As noted previously, in New Zealand and internationally, EE/EfS is characterised by a diverse set of stakeholders. It has a been common both in New Zealand and in other countries for formal and ad hoc networks to develop between stakeholders to try to provide greater coordination and development of common approaches to supporting school-based EE. However, establishing and maintaining effective links between these stakeholders and their various areas of activity has proved to be an ongoing challenge in New Zealand (Mardon, 2001; McClelland, 2000).

The activities that have been undertaken to establish and sustain EE/EfS practice in New Zealand schools and early childhood settings over the past few decades have included various efforts to:

- identify how EE/EfS aligns with the intentions of the national **curriculum**[16] and how it can be expressed in school-based curriculum, teaching, and learning
- develop EE/EfS **understanding and capability** within schools and early childhood settings, and amongst the teaching profession (pre-service and inservice)
- build and effectively disseminate **EE/EfS practice knowledge** to assist continuous development and spread of EE/EfS knowledge and practice within and across schools and early childhood settings
- establish and sustain **networks and partnerships** that support learners' and teachers' access to knowledge, resources, environments and contexts for EE/EfS
- develop a more coherent and **coordinated central policy framework**, aligning across MoE, MfE, and DoC priorities to support and give direction to EE/EfS.

[16] As expressed through *Te Whāriki* (Ministry of Education, 1996), *The New Zealand Curriculum* (Ministry of Education, 2007), and *Te Marautanga o Aotearoa* (Ministry of Education, 2008).

Our research update indicates that while there have been many pockets of progress and development across all of these areas over the past 11 years, this progress is unevenly spread and has lacked high-level coordination. There have been some clear successes in supporting the growth of EE/EfS practice in New Zealand schools and early childhood settings, and these gains can be attributed to a range of efforts and activities of the diverse stakeholders and supporters of EE, particularly through some of the more longstanding programmes and initiatives (e.g., Enviroschools, various programmes run by LEOTC providers, DoC, marine reserves, and so on), with support from researchers and educators in the tertiary sector and resources from a mixture of central and regional government, NGOs, charitable foundations, businesses, environment sector groups and communities.

The information from the new literature gathered, along with the research workshops convened for this update, suggest that many of the key findings from the 2002–3 study still apply to the overall picture for EE in New Zealand today. That said, with the passage of time there have been some interesting areas of growth and change, with some new themes rising to the surface. These will be discussed in Chapters 4 and 5.

4. What has changed since 2002–3? A brief view across the system

This chapter begins by looking at key developments in the system surrounding EE/EfS for young New Zealanders since the 2002–3 research, including key developments within the Ministry of Education and the New Zealand Qualifications Authority (NZQA), the Ministry for the Environment, the Department of Conservation, the Enviroschools network, and a selection of other nodes of key activity.

Ministry of Education

The period between the 2002–3 research and the present has included episodic gains and losses of educational policy momentum for EE/EfS development in schools. The introduction of *The New Zealand Curriculum* in 2007 has already been mentioned. For several years, the Ministry of Education funded three EE/EfS professional development programmes: Enviroschools (national office), the National EfS Team (NEfS), and Mātauranga Taiao.[17] An evaluation of these programmes indicated that each initiative was achieving greater inclusion of sustainability content and more integrative teaching across the curriculum, the development of facilitative teaching styles that were empowering students to become strongly engaged in their learning and to think critically about issues, and the development of sustainable practices in schools and their communities (Eames, Roberts, et al., 2010). The evaluation also identified ongoing challenges for fostering EfS in large primary and secondary schools; building a strong local knowledge base in EfS; and developing a coherent education strategy for New Zealand EE/EfS.

Ministry of Education funding for these initiatives ended in 2009 alongside major changes across all teacher professional learning and development (PLD). This was often discussed in the

[17] The Enviroschools programme began in Hamilton in the late 1990s as a local government initiative, delivering EfS support in schools through a local and regional structures. In the late 2000s, Ministry of Education funding supported a national office. The NEfS team grew out of a professional development programme for environmental education in the late 1990s. The team constituted a group of advisers and two co-coordinators located within six New Zealand universities and employed through School Support Services. Mātauranga Taiao began in 2007, and developed from a recognised need for targeted professional development in EfS in Māori-medium education. A national coordinator and two regional coordinators provided professional development for kaiako and Resource Teachers of Māori to enable them to foster EfS in Māori immersion programmes and kura.

workshops as a setback for EE/EfS; however an interesting side-note was that EfS facilitators were often known to have carried their knowledge and facilitation skills into new roles and jobs (for example, in local and regional councils, schools, and other environment and conservation organisations), and continued to support EfS programme development and growth through those roles. The implication was that the depth of EfS expertise has not necessarily been lost, but rather redistributed across the system.

> Passionate EE/EfS teachers and facilitators often move and "pop up" somewhere else, so we can take some heart from that. (Workshop participant, regional government)

Other positive and negative consequences of "churn" in the sector are discussed further in Chapter 5.

Other forms of support for EE/EfS from the Ministry of Education in recent years have included:

- an EfS curriculum resource page on TKI[18]
- EfS teaching and learning guidelines for planning senior secondary level programmes[19]
- learning experiences outside the classroom (LEOTC) contracts[20] which support short, site-based hands-on programmes tailored to *NZC* and teachers' curriculum intentions, with support materials for teachers to prepare for and build on these experiences in the classroom
- a recent emphasis on support for the science learning area, which has included new resources to support the development of "science capabilities",[21] as well research on how to strengthen partnerships between schools and the science community (Bolstad et al., 2013), some of which involve environmental and sustainability science projects and contexts.

NZQA

EfS achievement standards for NCEA Levels 2 and 3 were introduced around 2008–2009 and reviewed in 2013–2014 for their alignment with NZC and quality design principles for achievement standards.[22] Other achievement standards potentially relevant for EE/EfS at Levels 1, 2 and 3 can be found across a variety of other domains, including many within the various science domains, social science,[23] home economics,[24] and English.[25] These standards variously emphasise

---

[18] See http://nzcurriculum.tki.org.nz/Curriculum-resources/Education-for-sustainability

[19] See http://seniorsecondary.tki.org.nz/Social-sciences/Education-for-sustainability

[20] These include LEOTC programmes offered in zoos, ecosanctuaries, marine science centres, and other sites of ecological significance where students have a range of opportunities to engage with ecological and conservation concepts and actions.

[21] One of these capabilities is "Engage with science". This capability requires students to use the other capabilities to engage with science in "real life" contexts. It involves students taking an interest in science issues, participating in discussions about science and at times taking action.

[22] See http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/subjects/education-for-sustainability/levels/

[23] For example, AS91009 "Demonstrate geographic understanding of the sustainable use of an environment".

[24] For example, AS93102 "Evaluate sustainable food related practices".

students' understanding and ability to analyse environmental and sustainability issues in different contexts (including the scientific and human systems that interact around these issues), and in some cases, provide assessable evidence of *actual actions* undertaken by the learner (with reflection on those actions) in response to their understanding of the issues with the view to making some kind of difference.

As Chapter 5 will discuss, the critical action-taking dimension of EE/EfS continues to be one of the more challenging edges for EE/EfS practice, and there are some specific issues around action-taking that surface in recent EfS literature on EfS and NCEA. However, evidence from the literature and workshops also suggests that when it is achieved well, critically reflective personal action-taking can have a significant impact for learners and, in some cases, wider communities.

Ministry for the Environment

The Ministry for the Environment is the government's principal adviser on the environment in New Zealand and on international environmental matters. Current government priority areas in terms of New Zealand's environment are:

1. fresh water—allocation/quality
2. land use—contamination/resilience
3. marine—fishing sustainability, oil/minerals on seabed, economics/risk
4. climate and atmosphere—adaptation to changing climate (e.g., rising sea levels), and climate change mitigation
5. air—quality.

Though these priorities do change, any such list of priority areas (and the research and work programmes that flow from them) can provide relevant contexts for school-based EE/EfS. The MfE also manages a number of funds for environmental projects and participation around New Zealand (see Table 2). Activities supported through these funds are relevant for school-based EE/EfS in terms of potential opportunities they generate for the engagement of young people (both within and outside school) in localised, community-based environmental action. For example, environment centres provide projects, activities and services that empower communities to take action that materially improves environmental quality. The MfE also provides a website of EE resources and links for teachers.[26]

---

[25] For example, Matthewman (2014) suggests that assessment standards in English allow teachers considerable freedom to design assessment tasks that support and EfS learning intention or what she refers to as an "eco-critical" approach to English teaching.

[26] See http://www.mfe.govt.nz/more/community-and-public/environmental-education-resources-teachers

Table 2 **Funds managed by the Ministry for the Environment**

Community Environment Fund: Funds projects that support partnership between parties and increase community-based advice, educational opportunities and public awareness on environmental issues.
Waste Minimisation Fund: Funds waste minimisation projects that increase resource efficiency, reuse, recovery and recycling of waste, and decrease waste to landfill.
Contaminated Sites Remediation Fund: Provides funding to regional councils and unitary authorities to help with a contaminated sites investigation, remedial planning, and remediation of sites that pose a risk to human health and environment.
Environmental Legal Assistance Fund: Provides not-for-profit groups with financial assistance to advocate for an environmental issue of public interest at resource management cases at the Environment Court.
Te Mana o Te Wai Fund: Provides funding to support projects that enable Māori to improve the water quality of freshwater bodies (including lakes, rivers, streams, estuaries and lagoons) that are of importance to them.
The Fresh Start for Freshwater Clean-up Fund: Provided councils and their project partners with financial assistance to remediate water bodies of national significance. From 2011 to 2014 the fund allocated $14.5 million to seven projects.

Department of Conservation

Workshop participants connected with DoC noted that "as an organisation we have always worked in EE", and as a department rather than a policy Ministry, DoC has "people in green uniforms in every community". DoC participants described the organisation's approaches to supporting EE/EfS over time as trending away from "a lot of different stuff being done" in favour of "a more coordinated overarching framework" to provide more coherence in its support for conservation education. This has included development of an education strategy (Department of Conservation, 2011; Department of Conservation Te Papa Atawhai, 2011). Partnerships have been important in DoC's conservation education work, increasingly with community partners. One DoC workshop participant asked the rhetorical question: "How do you step back to allow the community to make initiatives sustainable?". This question was echoed in other workshops and will be explored again in Chapter 5.

Workshop participants from DoC noted that in the past the organisation has taken at least five different approaches to conservation education:

- producing resources for teachers (most of which are now out of date)
- LEOTC funded conservation educators (which is happening less now)
- Working with partners such as Enviroschools, the Mountains to Sea Trust, The Untouched World™ Charitable Trust (UWCT), LEARNZ
- Community-driven, place-based conservation projects (e.g., Kids restore the Kepler, Greening Taupo, the Hurunui College Nina Valley Restoration Group in partnership with DoC)

- "Dial-a-ranger" (DoC is moving away from this, as it's believed to be ineffective to have one-off talks and there are too few staff available to respond to these kinds of requests).

The new focuses for DoC are now:

- building schools' capability in EE/EfS/conservation education (not DoC doing the teaching)
- community-based programmes
- growing partnerships
- developing young people as new conservation leaders.

DoC's strengths include the ability to support learners to be able to take actions in and for the environment, informed by the knowledge and skills DoC holds in various aspects of conservation work (e.g., predator trapping). DoC staff who work closely with schools said there is a demand for conservation resources and schools are keen to engage with DoC, but there are issues with resources being outdated and not fit for purpose. DoC staff also identified the need for upskilling in EE/EfS so that DoC partners can be more effective supporters of EE/EfS as an *education* process rather than just an action process, supporting teachers to strengthen in-school programmes.

Enviroschools

Enviroschools has continued to develop and grow steadily as a network, currently involving just under 1,000 schools, kura, and early childhood education centres with funding support from regional and local authorities. The origin and development of the Enviroschools network was outlined in the 2002–3 study (Bolstad & Baker, 2004). The Enviroschools kaupapa is holistic and seeks to address school-and-community social, cultural, and economic health and sustainability. It is a facilitated process guided by Enviroschools' principles that emphasise experience-based learning. Enviroschools has a strong kaupapa of student empowerment, and encourages schools and early childhood settings to cultivate opportunities for students to participate in decision-making processes within schools, including in areas that traditionally they may not have been considered to have a voice (for example, operational decisions about school waste or resource consumption).

As an indicator of its impact and influence, much of the recent and accessible New Zealand literature on school EE practice has some connection to individual Enviroschools or the Enviroschools Foundation (Eames, Barker, et al., 2010; Eames, Roberts, et al., 2010; Green, 2014; Jackson, 2009; Kelly et al., 2013; Marshall, 2009; McKay, 2014; New Zealand Association for Environmental Education, Royal Forest and Bird Protection Society, Sustainable Living Education Trust, & The Enviroschools Foundation, 2014; the Enviroschools Foundation, 2013; the Enviroschools Foundation, New Zealand Association for Environmental Education, & WWF-New Zealand, 2011; Tringham, 2007; Vaeliki & Mackey, 2008; Wake, 2010; Wellington Region Enviroschools Team, 2013). The Enviroschools website provides statistics about Enviroschools by

region, including the percentage of schools in each region that are Enviroschools, the number of regional partners, as well as newsletters, stories, and pictures from featured projects in each region.[27]

The Enviroschools Foundation is a not-for-profit trust which, as an independent organisation, achieves nation-wide reach through partnerships with over 80 organisations. The programme is implemented regionally, along regional council boundaries and is supported by a network of people working for a range of different organisations. Regional partners contribute by providing funding, skilled people, ideas and networking opportunities and assistance differs from region to region depending on the number and type of organisations involved.[28] In May 2012, the Enviroschools Foundation secured $7.6 million over four years from the 2012 Budget (the Enviroschools Foundation, 2013). This four-year funding agreement through the Ministry for the Environment supports the ongoing development of two programmes: Enviroschools and Te Aho Tū Roa programmes, the latter working with kōhanga/puna reo, kura, wharekura and hapori (communities). In April 2015, the Enviroschools Foundation underwent a change of name to become Toimata Foundation.[29]

A national Enviroschools coordinator commented that the dual funding approach (central and regional) has helped to build resilience in the network, with local councils, communities, charitable foundations, and businesses providing support for the programme through periods of uncertainty or loss of central government funding. The regionalised and localised nature of the network also supports a diversity of processes and approaches in each region and within each school. Themes emerging from the literature and workshops regarding the characteristics of practice across schools and early childhood settings will be discussed in Chapter 5.

Other significant developments for EE/EfS at a national level

Growing philanthropic support for environment, education and, particularly, environmental youth leadership

In 2002–3, charitable foundations such as The Untouched World™ Charitable Trust (UWCT) and Tindall Foundation were already contributing to school-based environmental education (including Enviroschools) as well as shaping and supporting programmes to facilitate and inspire young New Zealanders to develop leadership capabilities in and through environment and sustainability projects.[30] The range of philanthropic organisations and foundations working in this space (and the related growing field of social enterprise and innovation) seems to have grown in prominence

[27] www.enviroschools.org.nz/in_your_region/map
[28] www.enviroschools.org.nz/enviroschools-programme/enviroschools-is
[29] See http://www.toimata.org.nz/
[30] For example see http://www.untouchedworld.com/charitable-trust/our-programmes/our-programmes.htm

over the past decade (for example, the NEXT Foundation,[31] the Sir Peter Blake Trust,[32] and others).

Youth-focused and youth-led networks and innovators in sustainability and climate action

Through the mid-2000s a number of youth-focused and youth-led networks and innovators began to form in New Zealand, with an emphasis on youth leadership around climate change; community action; having a voice in local, national, and international environmental decision-making forums; and social change.[33] These networks often intersected with one another (through the participation of key individuals across networks), as well as with organisations such as Enviroschools and many other foundations and trusts who provided support for these networks and their projects and activities. One exploratory study suggested these networks may reflect an early 21st century "zeitgeist" around sustainability, social change, self-organisation, and emergence (Roberts & Bolstad, 2010). The impact and longevity of these networks and their activities remains an open question. However anecdotal information suggests they have been formative in the emergence of a cohort of young adults who are visible in sustainability and enterprise activities in a range of sectors in New Zealand.

Other localised/national projects and programmes

Various other organisations and people around New Zealand have emerged (or continued) to provide programmes, project opportunities, and resources for schools in relation to environmental and sustainability contexts ranging from waste management and reduction to marine conservation, habitat restoration, and sustainable food. Projects supported by universities and the science community such as Marine Metre Squared (Mm^2) project encourage "citizen science" by providing individuals, families, schools, and community groups with simple tools for contributing to long-term monitoring of their marine environment.[34] The Experiencing Marine Reserves and Whitebait Connection programmes run by the Mountain to Sea Conservation Trust operate across multiple regions.[35] Emergent projects such as "Outlook for Someday" offer young people the opportunity to develop film-making skills through exploring sustainability as a theme (Education Gazette, 2012). Within the scope of this project we are not able to quantify the range of relevant EE/EfS programmes and resources currently available through all of these various organisations, nor how this has changed since 2002–3. A more complete stocktake of EE/EfS opportunities

---

[31] See http://www.nextfoundation.org.nz/

[32] See http://www.sirpeterblaketrust.org/

[33] See http://350.org.nz/about/350-aotearoa/, http://www.regeneration.org.nz/about-us, http://www.generationzero.org/about

[34] See https://www.mm2.net.nz/home

[35] See http://www.emr.org.nz/ and http://www.whitebaitconnection.co.nz/about_us_site_info.html

linked with different stakeholder organisations could be undertaken and could be considered as one step towards building a more connected EE/EfS system in New Zealand.

A renewed focus on strengthening New Zealanders' capabilities in science

In recent years there has been a renewed governmental focus on building New Zealanders' engagement with and capabilities in science, signalling the importance of science and innovation to New Zealand's economic and social future. Developments include the establishment of a Ministry of Science and Innovation, later incorporated into the new Ministry of Business, Innovation and Employment, and the 2009 appointment of Sir Peter Gluckman as the inaugural Prime Minister's Chief Science Advisor, with science education a key focus for this role (Gilbert & Bull, 2013). The recently launched strategy, *A nation of curious minds* (Ministry of Business Innovation and Employment, Ministry of Education, & Office of the Prime Minister's Science Advisory Committee, 2014) presents science and technology as critical for enhancing living standards through economic growth and improving social and environmental outcomes, and includes education as one of three key action areas for achieving the aims of the strategy.

This national focus on strengthening science education offers significant potential to strengthen EE/EfS, for example through additional resourcing, teacher professional development support, and access to partnerships and contexts within which learners engage with environmental and sustainability science. Existing and ongoing programmes and funds administered by longstanding players in the science education space (e.g., the Royal Society of New Zealand, universities, and so on) also provide opportunities to link science and sustainability learning goals in schools.[36]

Summary

The systems level overview in this chapter provides a context for understanding the wider frames that can support and enable EE/EfS learning opportunities for young New Zealanders. The overview is partial and cannot describe every structure or node around which EE/EfS practices are growing. However, this overview could be further developed and refined with input from key system-level EE/EfS stakeholders.

[36] As one example, the Bayer Primary School Science Fund is administered by the Royal Society of New Zealand, worth $120,000 over three years. The specific focus of the funding is environmental education and how this links to the Nature of Science strand of *The New Zealand Curriculum* (New Zealand Science Teacher, 2014).

5. What does school EE/EfS practice look like today? Insights from the literature and workshops

What we knew about EE practice in 2002–3

In the 2002–3 study, we noted some of the following general characteristics of EE practice in New Zealand:

- 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 (e.g., biodiversity, local flora/fauna, nature conservation, water, air, waste and recycling, tree-planting and bush studies, and various aspects of gardening).

These general characteristics still have some overall currency. The first three characteristics are particularly relevant in schools that have most strongly engaged with specific EE/EfS programmes and networks that promulgate and endorse these approaches (e.g. Enviroschools). The second two characteristics are also still relevant, but are also so general that only by looking more closely into practices within individual schools can we can understand the kinds of EE/EfS learning opportunities available to students. In the 2002–3 study, we noted the following features of practice to be common in the case study schools and kura that were effectively implementing EE across the school curriculum:

- focusing on the school environment
- snowballing and layering of environmental education activity
- curriculum integration and curriculum planning for environmental education
- commitment to large-scale environmental action projects
- support within the school and school community

- support from local environmental education people or agencies, and the media
- formalising environmental education into school policy and planning.

We also noted the following challenges arising for these schools:

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

Insights from the new data

As we reviewed data from the new literature and workshop discussions, we looked for information that signalled differences or continuities with the general trends and themes visible in 2002–3. Through this analysis, we began to develop a mixed picture of successes and challenges for EE today. Table 3 is an attempt to capture as many of the key messages as possible, presenting them as sets of contrasting statements as a way to reflect the overall mixed picture. The table incorporates some of the system-level messages discussed in the previous chapter, as well as practice-based information from the literature and workshops (discussed further below).

Table 3 **EE/EfS in New Zealand today: A mixed picture?**

	It seems that …	However…
Curriculum, teaching, and learning	• *The New Zealand Curriculum* provides broad scope for schools to bring a focus on environment , sustainability, and student agency into learning across the curriculum. • EE/EfS has synergies with ideas in NZC and contemporary educational thinking such as the use of authentic contexts for learning, inquiry learning, integration of knowledge across different disciplines, students having an active engagement in decision-making, and schools having stronger relationships with the community. • Some learning areas have especially strong synergies with EE/EfS, particularly in supporting students to learn how to take critically informed actions.	• Teachers' and schools' capabilities and motivation to actualise the potential for EE/EfS within *The New Zealand Curriculum* is variable. • Schools have other demands and priorities, EE/EfS may be less of a priority for some schools and teachers. • Some teachers and schools want to work within an existing EE/EfS structure or programme as this provides resources, contexts, and expertise as well as ways to evaluate and celebrate their achievement and progress. • Teachers' knowledge of EfS may be limited; primary teachers may also face challenges where science knowledge is needed to support effective EE/EfS.
	• It is becoming easier to find examples of schools undertaking longer-term, action-based whole-school projects, and other stories of outstanding practices; these are becoming more visible and celebrated in educational, mainstream, and social media. • Community-wide and multi-partner projects are also more visible.	• Achieving depth and sustainability of EE/EfS practice can take several years and often involves facilitation support and forming partnerships and relationships with people outside the school. • Some success stories are underpinned by the energy and capabilities of key individuals who may move on; it is harder to say whether exceptional projects and practices are sustained when personnel change, or whether these kinds of practices are spreading into other schools. • Those who champion partnership and community-based projects also wonder about how to best support communities, schools, and young people to take ownership of projects over the long term.
	• There has been a growth in the number of Enviroschools, and growing demand from primary and early childhood centres.	• Enviroschools facilitators can't always meet the demand from schools and early childhood centres for Enviroschools support.
	• Recent literature in outdoor education calls for a shift towards place-based approaches, foregrounding the cultural and environmental dimensions of places, (re)integrating outdoor education with EfS. • Innovative outdoor education/EfS programmes have been developed in tertiary institutions such as Christchurch Polytechnic Institute of Technology (CPIT).	• Research on the implementation of place-based and EfS approaches in outdoor education suggests change towards more sustainable outdoor education pedagogies is strongly interrelated with shifts or developments in teachers' philosophy, values, and understandings; educators need high levels of cultural awareness, understanding of the Treaty of Waitangi, an interest in other world views, and

	It seems that …	However…
		pedagogies to encourage the exploration of Māori beliefs and values.
	• A growing cohort of young people are coming through with sustained experiences in school-based and out-of-school EE/EfS programmes. • Various local/regional youth forums/hui provide young people with opportunities to connect and network with like-minded peers across schools (and across primary-secondary-tertiary divisions).	• There are questions about whether all learners are able to easily find pathways to carry their primary and early childhood education EE/EfS experiences through secondary, tertiary, and into employment.
	• There are perceived to be strong synergies between EfS and *Te Whāriki.* • Research on EfS in ECE demonstrates processes that can be used to develop place-based, culturally responsive approaches that foster an ethic of care for selves, others, and the environment.	• As with schools, there is variability in practice and approaches across the ECE sector. • The developments in ECE may be "under the radar" for teachers in primary and secondary schools; how can these sectors best access and utilise EfS knowledge developed in the ECE sector?
System supports	• EE/EfS per se has not been a priority focus for the Ministry of Education in recent years • The Ministry of Education no longer funds EE/EfS facilitators to provide school-based PLD and support.	• EE/EfS can be linked to and strengthened by connecting it with multiple parts of NZC, as well as Ministry focus areas such as science education, and success for priority learners. • Other funded Ministry programmes like LEOTC provide some opportunities for schools to access EE/EfS contexts and expertise. • Other organisations and partners from local government to philanthropic trusts have continued to provide support and resourcing for school EE/EfS.
	• There is a larger pool of expertise in EE/EfS pedagogy and facilitation.	• People working in these roles sit within many different organisations, and may struggle to network and collaborate as much as they would like to due to limited time and resourcing. • There is a risk of churn in this sector due to changes in funding or support for facilitation roles in the organisations they sit within.

	It seems that …	However…
NCEA	• The EfS achievement standards and other relevant standards across other domains open up many options for integrating EE/EfS into the senior secondary curriculum. • The flexibility of NCEA means it is theoretically possible to design cross-curricular courses, as well as innovate within existing secondary subject areas to bring a stronger EE/EfS focus.	• Some of the standards that can be used to assess senior secondary EE/EfS are difficult for teachers and students to understand and implement, particularly those around personal action-taking. • NCEA regulations around the number and spread of credits needed for university entrance could disincentivise teachers and students from designing or taking courses that can't give them the right mix of credits from approved subjects that they need to meet specifications for University Entrance.
Research	• There is much more New Zealand-based research on EE/EfS theory and practice in schools and early childhood centres than there was in 2002–3.	• Most research is small-scale, qualitative, and looks at specifically contextualised areas of practice. There has been less system-wide research or monitoring and evaluation of EE/EfS. • Before undertaking further system-wide research, key stakeholders should identify how the knowledge gained through research will be used to inform next steps in the advancement of EE, so that the scope for research can be appropriately narrowed around key knowledge gaps.
EE/EfS and Māori	• The New Zealand EfS literature frequently underscores the importance of approaches that acknowledge the Treaty of Waitangi, New Zealand's bicultural heritage, and the relevance of Māori spiritual and ecological knowledge in forming a New Zealand-based understanding of environment and sustainability.	• This research update provides inadequate coverage of intellectual and practice knowledge relevant for the advancement of EE/EfS that is developing in *Māori-determined* contexts.

The remainder of this chapter elaborates on some of these messages with reference to the literature and workshop conversations.

Opportunities and challenges for realising the potential for EE/EfS in *The New Zealand Curriculum*

The literature and workshop conversations highlighted the potential for meaningful EE/EfS to occur in schools in line with the broad intentions set out in *The New Zealand Curriculum* (Ministry of Education, 2007). The question of interest to researchers, and the workshop participants, is what it takes to enable teachers and schools to effectively realise this potential, and what features of school practice enable us to evaluate the presence and quality of EE/EfS.

> *The New Zealand Curriculum* provides the opportunities—sustainability is mentioned on pretty well every page [of the document]. Work with teachers needs to continue in order to realise these opportunities. (Workshop participant, Ministry of Education)
>
> *The New Zealand Curriculum* offers amazing potential, the question is whether teachers and schools have the time to put that lens on it. (Workshop participant, EE/EfS facilitator)

The literature includes various research and media reports of schools, teachers, students, and communities who have taken up these opportunities and generated rich, engaging student-led learning experiences. Most of this literature also suggests leadership by enthusiasts who can initiate ideas within the school and make things happen is still important, whether they are teachers, schools, senior management, students, or community members (e.g., see Anderson, 2009; Arthur, 2011; Carson, 2012; Flockton, 2013; Lebo III, 2012; the New Zealand Curriculum Online, 2012; Townsend, 2014; Wake, 2010; Wastney, 2014a, 2014b). Principals such as Gower (2011) underscore the significance of the leadership team's role in helping the school to be very clear that EE/EfS needs to be driven by the purpose of being able to meet the learning needs of the students.

Whole-school approaches

TLRI research led by Eames (Eames et al. 2010; Eames et al. 2013) aimed to design a framework for analysing what whole-school approaches to EfS in New Zealand schools might look like, working in partnership with four primary and two secondary schools that were also part of the Enviroschools programme. Overarching ideas that were important in developing the framework include that learning to learn is important in EfS—a feature of this is that it occurs through genuine contexts, topics or issues; also, four key areas of school life emerged as the starting point for examining and critiquing sustainability within the school: people, programmes, practices, place. Critical success factors identified in the literature included: having partnerships, political support and EfS expertise; programme support; curriculum alignment; professional development for teachers; making national links and links to other EfS initiatives; accreditation and certification; investing in monitoring and evaluation. Findings from the trial of the framework in six schools indicated that schools were likely to focus on one area of school life at a time; the use of a more knowledgeable mentor as facilitator in using the framework would help to maximise the outcomes for school staff; a mentor would help guide staff in balancing their critique of current practice and enhance decision making about how best to make progress in EfS in the school; but each school must find its own whole-school approach to EfS. The frameworks generated in the project provide guidance for how these pathways may ensure an orientation towards sustainability in a school.[37]

Some research has looked at schools which are *not* necessarily integrating EE/EfS deeply within and across the school curriculum. For example, Marshall (2009) surveyed 56 schools to explore

[37] The frameworks and guides can be found at http://www.tlri.org.nz/tlri-research/research-completed/school-sector/investigating-relationship-between-whole-school

how easy schools think it is to promote and engage students and staff in sustainable environmental education projects. All but one of the schools identified some EE activities going on, and most often projects were run by groups of students with a teacher. Just under half had no links to a support group, and the majority did not have a designated EE budget. Chalmers (2011) investigated EE/EfS learning experiences in five Bay of Plenty primary classrooms, finding evidence to suggest that teachers and students lacked a general understanding of the terms "environment", "EE/EfS", and "sustainability", and their views of these concepts were predominantly ecological in nature. A gap between current research and literature on EE/EfS and what was known by the teachers in Chalmers' study was clearly apparent. Teachers had received very little, if any, tertiary education or professional development in EE/EfS and therefore relied on their "lay" understandings. Examples of education "for" the environment were generally absent, and barriers to EE/EfS existed, time limitations being commonly mentioned by teachers. Finally, Flockton (2013) studied five secondary schools. He found none of the schools had introduced sustainability as an integrated subject, and cross-disciplinary links were weak. There was evidence of a traditional biophysical problem focus rather than a holistic view highlighting the links between environment, economy, and society. However, there was some evidence of understanding the link between environmental concerns and human behaviour, and where schools have developed links to community based initiatives, students were engaged and understanding increased.

Supporting and strengthening EE/EfS within learning areas

Although whole-school, cross-curricular approaches to EfS are widely endorsed in the New Zealand literature, some literature and workshop conversations questioned its viability in secondary schools, and raised the need to support teachers, particularly in secondary classrooms, to integrate EE/EfS deeply *within* their disciplinary areas, regardless of the presence or absence of whole-school or cross-curricular approaches. For example, Matthewman & Morgan (2014) argue that all curriculum subjects need to find ways to teach about post-carbon futures (p. 27), and suggest a scenaric approach to futures education that enables scenarios to be written in different ways to reflect the concerns of different learning areas. Matthewman (2014) argues for New Zealand teachers to bring attention to "ecocriticism" through English by sharpening and shifting the gaze on to the environmental aspects of texts in ways that help to realise the intent of NZC and the English learning area. A current pilot project led by Matthewman is working with two Auckland secondary schools to explore how the "future focus" theme of sustainability can be integrated into the secondary school curriculum. The premise of the project is that for EfS to realise its potential, the distinctive ecological knowledge and practices available within learning areas must be valued as informing students' environmental identities. The research is investigating how students represent their understanding of sustainability and environmental identity through the learning areas of English and social sciences.

Some workshop participants raised other examples of secondary teachers they have seen doing good EfS work in "unexpected" places in the senior secondary curriculum (for example, in a

French language class), and wondered how to effectively support and encourage these teachers and make their work more visible to other subject specialist teachers within and across schools.

Growing demand for Enviroschools and other structures to support school-based practices

In late 2014, Enviroschools undertook a national census to build a picture of the activities and outcomes of the Enviroschools programme in schools and early childhood centres nationwide. 688 schools and centres responded to the survey and a range of findings from an initial analysis are reported on the Enviroschools website, with a full report expected later in 2015.[38]

Enviroschools workshop participants and other EfS facilitation and programme providers commented that the demand from schools and early childhood centres is growing and that they are not able to respond to all the requests.

> There is demand from schools but we're not able to resource it—a lot of my time is spent trying to support [schools that Enviroschools can't take on] to find out what else they could do instead. (Workshop participant, regional Enviroschools facilitator)

One Enviroschool principal (Marshall, 2009) interprets the growth in demand for Enviroschools as an indication that schools like a structure to work in, even if they are already doing EE in various ways. Other workshop participants also observed through experience that teachers gained confidence when they had support, guidance, resources, and networks to assist them with their practice.

Workshop stories shared by EE/EfS facilitators and teachers from "mature" Enviroschools indicate that it can be a long and recursive process for schools to get to a point of deep and sustained EE/EfS. Very successful EE/EfS schools attract a lot of interest and visitors from other schools wanting understand what the schools are doing, and how they have been able to do it.

> We have a vision map, we revisit this often. … Lots of visitors come to the school to see our journey, but they need to find their own journey. (Workshop participant, Enviroschools Green-Gold primary school)

Some EE/EfS and Enviroschool facilitators have observed "cross-pollination" between schools to be important in their evolving practices. Both the workshops and the literature brought up examples of multi-partner projects involving connections with multiple schools. In other areas, facilitators are seeking to create more opportunities for schools they worked with to share. connect, and collaborate. Regional Enviroschools newsletters are another way that school practices and learning opportunities are shared.

---

[38] See http://www.enviroschools.org.nz/outcomes_and_benefits/2014-evaluation

Energy around EE/EfS in New Zealand early childhood education

In all three workshops, participants commented on the growth of interest and research on EE/EfS practice within the early childhood sector. This is particularly significant as early childhood EfS has previously been noted as a "hole" in the international EfS literature that the environmental education community should have the "courage to discuss" (Reid & Scott, 2006a, p. 24, cited in Davis, 2009, p. 9)Participants (and the literature) note strong synergies between EE/EfS and the structure and intention of *Te Whāriki*. For example, the dispositional approach to learning supported by *Te Whāriki* lends itself to the development of children's dispositions of care for the environment. The socio-cultural learning framework of *Te Whāriki* further emphasises "socially and culturally mediated learning where children learn in collaboration with adults and peers" and situates the child as a competent learner who "makes a valued contribution to society" (p. 9, see also Vaeliki & Mackey, 2008). The statement that "liaison with local tangata whenua and a respect for papatuanuku should be promoted" (p. 54) provides a platform for culturally responsive EE/EfS practice.

Various early childhood centres were mentioned during the workshops as examples of successful approaches that have engaged tamariki and the community in developing an ethic of care and responsibility for the environment, including some which have been researched (see below). One workshop participant described early childhood education as "ready to explode" in terms of its readiness and interest to cultivate EE/EfS practice, and several New Zealand early childhood conferences over the past decade have focused specifically on EE/EfS.[39] However, questions were also raised in the workshops about the potential variability in ECE practice across this sector given the range of different centres and service providers across New Zealand.

Within the scope of this update we could not do an exhaustive search of the early childhood literature relating to EE/EfS in New Zealand; however, notable contributions to this field in recent years include Vaeliki and Mackey's (2008) study of the "ripple effects" of EE in a kindergarten for children, teachers, families, and the community; Ritchie, Duhn, Rau, and Craw's (2010) study involving 10 early childhood centres in New Zealand; the Kelly et al. (2013) action research project which explored ECE pedagogy "within" and "beyond" the gate in ECE settings committed to sustainability; and Biss's (2012) small study of learners aged 5–7 through their transitions from EfS in their early childhood education into primary school. These studies provide insights about how some early childhood centres have created experiential learning around EfS. The children's experiences build, over time, a platform from which they develop ideas around education for the environment. Researchers in ECE tend to consider nature education and education for sustainability as fostering affective learning and incorporating embodied ways of knowing,

[39] Examples include the Hand-in-Hand Education for Sustainability Conference in Christchurch in 2006 (see Vaeliki & Mackey, 2008), and Tauranga Regional Kindergarten Association's Sustainability in ECE conference in Tauranga from 28–29 July 2011 (see http://www.enviroschools.org.nz/in_your_region/bay_of_plenty/featured-projects/tauranga-regional-kindergarten-conference).

engaging minds, bodies and hearts. The early childhood literature has strong themes around place-based pedagogies and the opportunity to integrate and enact bicultural, Tiriti-based approaches and Māori ecological knowledge and beliefs about guardianship of, connection to, and care for the environment. The ECE literature also tends to emphasise young children's role as *active contributors* developing their capabilities through active engagement—with teachers' and parents' involvement—in identifying issues and determining environmental actions in their early childhood settings, homes, and community. This links with a greater discourse about children's *rights* to know about social and environmental issues; to be part of conversations and possible solutions; to have their ideas and contributions valued; and to seek solutions with others in order to be able to take meaningful action (e.g., see Mackey, 2012). The discourse about children and young people's right to be active participants in all matters that affect them is a strong thread in the early childhood literature (Pramling Samuelsson, & Kaga, 2008) and also recurs in the EE/EfS literature around school-aged learners and young people.

Vaeliki and Mackey's (2008) research on a small kindergarten that had focused on an environmental curriculum for several years looked at how "environmental competency in children, families, and teachers strengthens when momentum for sustaining an environmental curriculum is a collective responsibility" (p. 10). Their study drew together data from interviews/observations with children, teachers, and families from the kindergarten to discuss three specific competencies that developed: the openness to consider alternative environmental practices, the confidence to advocate for and express a desired outcome, and persistence at sustaining environmental practice.

In the study by Ritchie et al., the drive and commitment to enact different philosophical and theoretical knowledge/s in support of ecological sustainability reflected a range of different desires, including being actively involved in practices that considered and took action to alleviate climate warming; enacting indigenous knowledge/s; and enacting everyday practices that enabled children, their family/whānau, and teachers opportunities to (re)connect with the natural world and/or to work with the natural world with processes of sustainable (hand-made) production.

The study by Kelly et al. (2013) concluded that natural environments "within" and "beyond the gate" are powerful contexts for children's learning in, about, for, and with the environment, and through careful scrutiny of their practice, teachers in the study "revisioned" their pedagogical roles. They concluded that professional development programmes, targeted funding, mentoring, and increased recognition of additional support are necessary; adults' knowledge of the environment is important alongside recognising that the natural environment is the context for learning and not just the focus of learning; knowing about the local land features from traditional Māori and non-Māori perspectives supports teachers to become more "place responsive" in their teaching outdoors; and relationships with the local environment are deepened when families' funds of knowledge and those of local iwi are sought and incorporated.

The literature discussed above provides some indication of the development that has been occurring in the EE/EfS early childhood sector, but as previously noted, is an incomplete account

of this field due to scoping limitations. In the research workshops, participants from the early childhood sector underscored the importance of early childhood EfS being as visible and supported as school EE/EfS, so that knowledge and practice in this sector can continue to contribute to further development of EE/EfS practice, research, and policy.

Place-based pedagogies and calls for reconceptualising education "in" the environment (outdoor education)

One trend over the last decade is a growth in New Zealand literature around place-based curriculum and pedagogies. This interest in place-based educational approaches spans early childhood education, schooling, and tertiary sector contexts, and connects with different disciplinary focuses including EE/EfS (e.g., Bolstad, 2005), outdoor education (e.g., Brown, 2012; Irwin, Straker, & Hill, 2012), Māori education and success for Māori learners (e.g., Penetito, 2004; Townsend, 2014), and history education (e.g., Harcourt, 2011).

At secondary and tertiary level there have been calls for shifts in thinking and practice to (re)connect outdoor education and EE/EfS though more integrated, culturally-responsive, place-connected approaches, rather than framing outdoor education as mainly about personal development through risk and challenge contexts.

The opportunities and challenges for implementing place-based approaches to EfS/outdoor education have been explored in several small studies in secondary and tertiary teaching contexts, including Brown (2012), Hill (2011), Irwin (2010), and Townsend (2014)[40] Assessment challenges and opportunities are also a feature of this literature (see section below on EfS and the NCEA). Several workshop participants from the tertiary sector shared stories of innovations in tertiary-level teaching of integrated EfS/outdoor education; for example, programmes offered through the Christchurch Polytechnic Institute of Technology (CPIT) (Cosgriff et al., 2012). Tertiary institutions such as CPIT are also providing integrated EfS/outdoor education opportunities for secondary NCEA students.

The New Zealand literature raises questions about what kinds of knowledge and experience outdoor educators may need to effectively bring place-based, culturally responsive, and EfS-linked approaches into their outdoor education curriculum and practice. Two secondary teachers in Brown's (2011) study expressed a desire for teachers to be the primary partners with students in the learning process rather than outsider contractors being brought in for their specialist skills. These teachers expressed frustration with programmes where they were sidelined by technical/contract staff who had no ongoing relationship with the students post-programme. Both schools in this study developed local journey-based programmes that engaged students in activities that responded to the geographical, historical, and cultural context in which they were

[40] Townsend's study describes the implementation of a Year 12 place-responsive outdoor education course that specifically aimed to make outdoor education appealing and desirable to Māori students.

located, and teachers reported the pedagogical benefit of building stronger relationships between staff and students. Change towards more sustainable outdoor education pedagogies is said to be strongly interrelated with shifts or developments in teachers' philosophy, values, and understandings (Hill, 2011). Brown (2011) concludes that a place-responsive approach encourages teachers and students to develop programmes that are responsive to their needs. This is not a prescriptive approach nor does it impose a simple recipe or model to implement; programmes need to be context specific. Cosgriff et al. (2012) conclude that outdoor educators need high levels of cultural awareness, understanding of the Treaty of Waitangi, an interest in other world views, and pedagogies to encourage the exploration of Māori beliefs and values.

EfS and Māori knowledge; EfS and Māori learners

The New Zealand EfS literature frequently discusses the importance of building New Zealand EE/EfS approaches on foundations that acknowledge the Treaty of Waitangi, New Zealand's bicultural heritage, and the relevance of Māori spiritual and ecological knowledge in forming a New Zealand-based understanding of environment and sustainability (e.g., see Arthur, 2011; Eames et al., 2010; Jackson, 2009; Kelly et al., 2013; Matthewman, 2014; McKay, 2014; Ritchie et al., 2010). While most EfS literature frames this challenge in terms of its value in supporting *all* learners, particularly in realising some of the "front end" aspirations of NZC[41] (or *Te Whāriki*), a few studies have looked specifically at the benefits for culturally-responsive and place-based approaches specifically for engaging Māori learners in mainstream school contexts (Anderson, 2009; Townsend, 2014).

While the "mainstream" EE/EfS community has long championed the need to value and understand Māori world views and seek guidance, input, and partnership from Māori in the pursuit of EE/EfS learning opportunities for *all* young New Zealanders, there has also been a parallel process of development and research work within the Māori world, including research with kura kaupapa, wharekura, iwi and hāpu. This work is building a knowledge base of theory and practice around Māori environment, sustainability, and science knowledge and around what effective partnerships between Māori communities and science/sustainability education partners can achieve (e.g. see discussion about the Matauranga Taiao project in Eames et al., 2010; e.g., see the science wānanga case study discussed in Bolstad et al., 2013; see also McRae, 2014; Penetito, 2004).[42]

This research update provides only very preliminary/tentative coverage of intellectual and practice knowledge relevant for the advancement of EE/EfS that is developing in Māori-determined

[41] For example, aspirational statements that young New Zealanders will be positive in their own identity, connected to the land and environment, contributors to the well-being of New Zealand—social, cultural, economic, and environmental, and work to create an Aotearoa New Zealand in which Māori and Pākehā recognise each other as full Treaty partners, and in which all cultures are valued for the contributions they bring.

[42] See also http://www.toimata.org.nz/

contexts. This is a significant limitation of the study and partially attributable to the limited scope and time frame in which the update was prepared. However, some relevant questions for the ongoing and future development of EE/EfS in New Zealand include:

- who has the authority to speak about what kinds of educational approaches and practices are best suited to supporting Māori educational aspirations, or what those aspirations may be with respect to the environment and sustainability?
- what kinds of support and partnerships can best support Māori to determine and achieve their educational aspirations with respect to the environment and sustainability?
- how can supporters of, and stakeholders in "mainstream" EE/EfS in New Zealand, support and learn from EE/EfS development work that is (or could be) happening in Māori educational and community spaces?

As a final comment, the brevity of coverage of EE/EfS in relation to Māori knowledge, communities, learners, and values in this report should not be mistaken for an absence of relevant practice and research knowledge in this space. Rather, it was the scope limitations for this update which precluded a more thorough and robust exploration of this important dimension of New Zealand EE/EfS research and practice. In our view, this points to the need for a more concerted effort to identify and ensure effective means for this knowledge to have a central place in ongoing conversations and development work around New Zealand EE/EfS.

Action competence and taking action "for" the environment

Since 2002–3 there has been a growth in New Zealand EE/EfS literature about children and young people learning to take action "for" the environment, and in particular, the concept of developing students' "action competence" (Aguirre-Bielschowsky, 2014; Arthur, 2011; Birdsall, 2010; Birdsall & Glasgow, 2014; Biss, 2012; Department of Conservation Te Papa Atawhai, 2011; Eames, Barker, et al., 2010; Jansen & Boardman, 2011; MacTavish, 2011; Wake, 2010; Wilson-Hill, 2006). Partnership projects reported in educational media such as "Kids Greening Taupo" and "Kids Restore the Kepler" (Orchard, 2014) illustrate examples where school students' active involvement and engagement can be situated within wider community-driven local environment and conservation projects. Other similar project examples in different regions were described by workshop participants.

In terms of action-taking and "action competence", the literature and workshops consistently affirm the need for adults, teachers, and schools to think critically about how to support children and young people to take action in ways that have the potential to be meaningful both from the perspective of environmental and sustainability impact *and* meaningful in the sense of being owned by the learners. Several workshop participants reiterated that EE/EfS has to be seen

foremost as an *educational* process, and not just students doing environmentally "good" things.[43] Themes include the need to share more power and leadership with learners (Eames et al., 2006; Wilson-Hill, 2006), sufficient flexibility in time and processes to enable learner-led interests and ideas to be explored with appropriate scaffolding, and for considered actions to be taken and critically reflected on.

> [The goal would be for learners to undertake] true inquiry that results in action, that is led by students, and is celebrated. This creates mana … collaborations with the wider community and linked with the whole school vision. (Workshop participant)

> [In primary schools] if there's a new topic every term it can be a barrier to taking action [for the environment]. (Workshop participant, EfS facilitator)

Birdsall (2010) proposes that action-taking itself needs to be framed as a learning process (rather than just an outcome of learning). She proposes that students could learn about the nature of action through a three-part model that consists of learning *about* action (how to envisage the future and ways of achieving their vision), learning *through* action (experiencing the planning and taking of action), and learning *from* action (having opportunities to reflect on their actions and the actions of others to determine their efficacy).

The literature and the workshop participants also noted that learners' (and teachers') efforts to undertake critically-informed actions "for" the environment have the potential to lead them to challenge existing norms and power structures.

> Some people see [EE/EfS] as kids doing some nice things in the environment but they don't necessarily want young people to be critical questioners. (Workshop participant, EfS facilitator)

The issues around what kinds of personal and collective actions learners can, might, or should be taking as part of EE/EfS, as well as how the quality and effects of those actions ought to be evaluated, are also strongly evident in the literature around EfS and assessment in the senior secondary curriculum.

EfS and the NCEA: Opportunities and challenges

The effect and usability of the EfS standards has been the focus of small-scale research in secondary schools offering EfS and EfS-linked programmes for senior secondary students (Birdsall & Glasgow, 2014; Cosgriff & Gillespie, 2011; Haines, 2012; Hipkins & Spiller, 2012). This collection of small studies suggests both encouraging and problematic dimensions for EfS curriculum and NCEA assessment practices at the senior secondary level. For instance, EfS assessments have the potential to enable integrated and holistic teaching and learning approaches,

[43] As Birdsall (2010) notes, the idea of "pro-environmental behaviour" is contested and socially constructed; "what constitutes such behaviour is dependent upon the meanings and values given to behaviour by people … it is *people* [who] determine what has value for them in their environment" (p. 3).

student involvement within and beyond the school community, and critical thinking. Education for sustainability can be used to design cross-curricular courses to study real-world issues of relevance to students; open alternatives to more traditionally designed science subject courses that promote students' active engagement with science for citizenship (Hipkins & Spiller, 2012); or support shifts in outdoor education programmes from traditional, adventure-based conceptualisations towards approaches that promote student understanding of, connectedness to, and willingness to take action to sustain particular places (Cosgriff & Gillespie, 2011; Hill, 2011) or promote action competency development through media-related projects such as filmmaking (MacTavish, 2011). However, the practicalities of working interdepartmentally may moderate the uptake in some schools (Cosgriff & Gillespie, 2011), and there are also issues related to the regulations around how credits are to be accumulated to achieve university entrance that can act as a disincentive for teachers to devise courses that reflect 21st century outcomes signalled as important by NZC, particularly those in the "front end" of the curriculum (Hipkins & Spiller, 2012).

Some literature and workshop participants commented that some teachers may not be aware of the EfS standards or are not confident about using them. Recent NZQA assessment reports and commentaries hint at some of the difficulties secondary students may be having in demonstrating an understanding of some of the deeper issues and concepts associated with working towards a sustainable future (e.g., see NZQA, 2008, 2009, 2010, 2011). The NZQA commentaries mirror comments from teachers in Haines' (2012) small study, who felt that their students were challenged by the concepts of EfS and that the achievement standards were difficult for their students to achieve; however students enjoyed the practical aspect of EfS and often placed more importance on their actions, and the practical part in particular.

At least one relevant research project is currently in progress to explore how secondary teachers and students interpret and implement the "personal social action" NCEA social studies standards at Levels 1–3.[44] As the authors of the in-progress study note, whilst these standards hold the potential to support transformative citizenship education, previous research suggests that taking social action can be viewed as "risky" and that school-based social actions stick to safe versions of active citizenship.

Innovation, whole-community projects, long-term projects

When asked what has changed in EE/EfS over the past decade, workshop participants pointed to variety of "innovation" and multi-partner projects and programmes that they considered to be good examples;

[44] The project, which runs 2015–2017, is called "Creating active citizens? Interpreting, implementing and assessing 'personal social action' in NCEA social studies". See http://www.tlri.org.nz/tlri-research/research-progress/school-sector/creating-active-citizens-interpreting-implementing-and

One such example was Evolocity, an electric vehicle-building project that is believed to be engaging students who would not typically have been engaged with traditional school-based EE/EfS. Evolocity is:

> a project-based learning competition for high schools, in which teams are equipped with an electric bike componentry kit and a set of year-end challenges. They then design and build their vehicles (with assistance from polytechnic tutors, Evolocity facilitators and volunteers from the engineering community) and at the end of the year, bring their vehicles to a Motorsport Park for competitive events against the other teams.[45]

Other workshop participants talked about the growing recognition that environmental restoration work will be a key component for regional economic development. They emphasised the importance of forging long-term linkages between young people, schools, communities, and the organisations coordinating and leading this work so that young people can be actively engaged and supported in pathways towards employment. The Reconnecting Northland Project (RNP) was discussed as one example; it is a region-wide ecological restoration project being undertaken by WWF-New Zealand and the New Zealand Landcare Trust which is intended to continue for a number of decades—"the timescale needed to see improvements in ecological systems at a landscape scale".[46]

Workshop participants who have been involved in whole community and multi-partner localised EE/EfS projects and programmes were conscious of what it takes to establish and sustain these kinds of programmes, and asked rhetorical questions about how to best empower communities, schools, and young people in ways that might enable them to have long-term ownership and stewardship over these programmes.

Churn in the professional networks that support schools' EE/EfS practice

Workshop participants who work with schools in various capacities as EE/EfS facilitators and project partners talked about the challenges for sustaining their work with schools and young people amidst changing funding structures and shifting priorities in central and local government with respect to both the environment and young people.

Some workshop participants have worked in local government as EfS facilitators or in teams that promote "youth engagement" with local and regional government policy and planning. These teams described various initiatives including youth hui and forums which have brought local students together to look into the environmental management issues in their own regions (e.g., freshwater management), and provide youth environmental leadership mentoring. A variety of "out of school" programmes for young people keenly interested in environmental and

[45] See http://evolocity.co.nz/

[46] See http://www.foundationnorth.org.nz/News-publications/News-and-features/Reconnecting-Northland%E2%80%99s-ecosystems

sustainability issues provide students with opportunities to connect with like-minded peers, and many of these hui and youth jams intersect with school-based programmes and student support. One challenge mentioned was that local and regional government organisations may not see support for "youth engagement" and "education" as part of their remit.

> It's been one of the biggest challenges, to convince [our organisation] that local government has a role in education—and that working with young people is part of that … my question for local governments is where should we [EfS/youth engagement facilitators] sit within our organisations? We get thrown around, it is tiring. (Workshop participant, local government, youth engagement specialist)

People in these roles said that they maintained momentum around programmes and projects over time by "looking for the pockets that value the engagement of young people" and constantly reinforcing the message that young people need to be seen as key stakeholders and participants in decision making on matters that affect them, as a matter of right.[47]

What teachers need to know to facilitate students' EE/EfS learning opportunities

The New Zealand literature and discussion from workshop participants tends to identify a substantial knowledge and experience base around EE/EfS principles and practice that educators need to be effective facilitators of EE/EfS learning. Most studies conclude that effective EE/EfS practice knowledge takes time to develop, and can involve reasonably deep shifts in educators' knowledge, values, attitudes, and practices across a range of areas, including their understanding of science, sustainability, social forces, cultural values, student agency, and "learning to learn", amongst other things. These findings all have implications for the kinds of professional learning and development that are likely to be effective in supporting teachers to continue to develop their EE/EfS practice.

[47] For example, in line with the United Nations Convention on the Rights of Children (UNCROC). The New Zealand government ratified UNCROC in 1993.

6. What next?

One conclusion from this update is that there is now a substantive body of published knowledge (research and teacher resources) that is relevant for supporting New Zealand teachers to develop EE/EfS practice. There is also a substantive amount of practice knowledge distributed amongst teachers, facilitators, and learners who have had opportunities to work in EE/EfS, and evidence that this practice knowledge is being shared laterally across and between some schools where possible. However, challenges for continuing to advance EE/EfS across the system are:

- how to ensure that teachers across all year levels and areas of the curriculum can effectively access and use this knowledge[48] to integrate EE/EfS into school curriculum and practice in ways that are locally responsive to the needs and contexts of their learners and communities and help to realise the intentions of NZC[49]
- how to monitor and evaluate progress in efforts to advance EE, given the cross-curricular nature of EE/EfS, the decentralised nature of school curriculum design and implementation, and the complex question of whether or how to most appropriately monitor New Zealand students' learning opportunities and learning gains in EE/EfS over time
- how to determine equity of access and opportunity for engaging, meaningful EE/EfS for all learners across the system.
- how to share responsibilities and coordinate work across key stakeholder domains to maximise the effectiveness and impact of this work in supporting EE/EfS in schools.

This chapter recaps emergent insights from this update report and presents these for discussion as an aid to determining next steps.

[48] And generate and share new practice knowledge.

[49] For example, ensuring that EE/EfS approaches maximise learners' opportunities to develop as "confident, connected and actively involved" learners who are "connected to the land and environment", "participants in a range of life contexts", "contributors to the well-being of New Zealand—social, cultural, economic, and environmental" and other key aspirations of NZC.

Emergent insights from this update report

EE/EfS curriculum and pedagogy

- While there is scope within *The New Zealand Curriculum* for individual teachers or whole schools to integrate EE/EfS within and across the school curriculum, New Zealand research and practice knowledge suggests that teachers and schools value guidance and support about how to do this effectively.
- Developing expertise in EE/EfS takes time, and while there are some general principles of EE/EfS that can apply across learning and teaching contexts, there are also specific kinds of expertise about how to facilitate EE/EfS in ways that are appropriate and responsive to the needs of different learners (e.g., ages, interests, levels of schooling, cultural backgrounds, communities in which they live, and so on). There is also specific expertise about how to integrate EE/EfS with different disciplinary knowledge and learning areas of the curriculum (e.g., science, history, geography, outdoor education, English, and so on).
- Research suggests that development of teachers' EE/EfS expertise, whichever context(s) they teach within (ECE, primary, secondary) is often interrelated with other shifts or developments in teachers' philosophy, values, and understandings, including (among other things) their understanding of science, sustainability, social forces, cultural values, student agency, and "learning to learn". These findings all have implications for the kinds of professional learning and development that are likely to be effective in supporting teachers to continue to develop their EE/EfS practice.

The system-level view

- There is cross-sectoral interest in advancing EE for young New Zealanders, supported by a range of stakeholders who each have something to contribute to this shared goal.
- Key stakeholders want to understand the current status of EE/EfS activity in schools in order to guide next steps. This research update is one step towards developing a more comprehensive picture and could be followed by more focused gap analysis in specific areas of interest identified by the key stakeholder group.
- Across the system, there are identifiable nodes and networks of activity that support EE/EfS learning opportunities for students. Enviroschools is the largest of these networks, touching just under 1,000 schools and ECE centres, but there many are other smaller networks and nodes. These nodes will continue to be an important source of data about EE/EfS practice (including opportunities and challenges), and will likely continue to generate new information over time, including published and unpublished data (research and evaluation reports, participation statistics, practice-based stories and reports) and undocumented practice knowledge held by educators, facilitators, and coordinators through their work with schools.
- The system-level challenge is how to *integrate and regularly update* this disparate mix of information, which is held in different nodes of the system and stored in different ways

(including documented knowledge and practice knowledge) in ways that can advance collective thinking and the ability to see achievable next steps for advancing EE/EfS.

- Some nodes of activity and associated pools of knowledge are inadequately addressed in this research update, and there are key groups whose perspectives on the advancement of EE/EfS for young New Zealanders are missing from this analysis. These include:
  - Māori educators, facilitators, researchers, and rangatahi who have been developing knowledge and practice around EE/EfS within Māori-determined contexts, through kaupapa Māori approaches.
  - Young people, including school-aged learners and emerging young adults who have benefitted from learning opportunities through various in-school and out-of-school EE/EfS programmes and networks.
  - Pasifika EE/EfS educators, researchers, and learners.

Possible next steps

In moving forward, we present the following possible next steps for consideration.

- Frame next steps in terms of a goal of *building a more connected, future-oriented EE/EfS system*. This recommendation aligns with similar research recommendations that have been made about building a more connected, future-oriented science education system in New Zealand (Bolstad et al., 2013; Gilbert & Bull, 2013). The key message here is the need to take a whole-system perspective, bring together relevant stakeholders to consider what each can contribute to the collective challenge, set shared goals to work towards, and form agreed indicators of what "success" looks like in terms of strengthening EE/EfS across the system.
- We also recommend looking closely at current and recent developments around strengthening science education and enhancing New Zealanders' capabilities in and engagement with science[50] to identify areas of alignment or possible "quick wins" for strengthening EE/EfS in schools and communities.
- Explore the kinds of partnership approaches that might be appropriate for accessing knowledge and working in partnership with different groups whose knowledge and perspectives around EE/EfS are notably underrepresented in this analysis (including young people, Māori, and Pasifika).
- Stakeholders in the "mainstream" education and environment sectors should bear in mind that there is a need to support and acknowledge self-determination in how each of these diverse groups is building knowledge, values, and practices relating to the environment, sustainability, education, and the future. There are a variety of partnership models that could be used to guide further engagements with Māori, Pasifika, and youth stakeholders in EE/EfS to bring their experiences and knowledge into the mix.

[50] Discussed in Chapter 4.

- Building from the initial analysis presented in this report, a more complete stocktake across nodes of EE/EfS activity (e.g., EE/EfS opportunities linked with different stakeholder organisations) could be undertaken and could be considered as one step towards building a more connected EE/EfS system in New Zealand. One question to look at would be which schools and communities are *not* accessing curriculum support from EE/EfS partners, why this is the case, and whether this has any bearing on the presence or quality of EE/EfS learning opportunities for students in those schools.
- Before undertaking further system-wide research, key stakeholders should identify how the knowledge gained through research will be used to inform next steps in the advancement of EE, so that the scope for research can be appropriately narrowed around key knowledge gaps.

References

Aguirre-Bielschowsky, I. (2014). *Electricity saving behaviours and energy literacy of New Zealand children* (Doctoral thesis, University of Otago). Retrieved from http://hdl.handle.net/10523/4685

Ahlberg, M. (2003). Education for sustainable development. Retrieved 24 April 2003, from http://savonlinnakampus.joensuu.fi/ahlberg/index.htm

Anderson, D. (2009). *Harakeke: Enhancing Māori student engagement and achievement in a mainstream primary school* (Master of Education thesis). Retrieved from http://hdl.handle.net/10289/3953

Arthur, M. (2011). *Development of action competence using education for sustainability in New Zealand schools* (Master of Science thesis, University of Waikato, Hamilton). Retrieved from http://hdl.handle.net/10289/5376

Barker, M. (2001). Learning for the environment—How can science educators contribute? *New Zealand Science Teacher, 98*, 7–14.

Birdsall, S. (2010). Empowering students to act: Learning about, through and from the nature of action. *Australian Journal of Environmental Education, 26*, 65–84.

Birdsall, S. (2011). *The pedagogical realisation of education for sustainability* (Doctoral thesis, University of Auckland, Auckland). Retrieved from http://hdl.handle.net/2292/10326

Birdsall, S., & Glasgow, B. (2014). Creating a new pathway for learning using education for sustainability. *set: Research Information for Teachers*(2), 41–47.

Biss, T. (2012). *Education for sustainability in transition of children from early childood education to primary school* (Master of Education thesis, University of Waikato, Hamilton). Retrieved from http://hdl.handle.net/10289/7026

Bolstad, R. (2005). Environmental education: A place in the curriculum? *New Zealand Annual Review of Education, 14*, 215–235.

Bolstad, R., & Baker, R. (2004). *An evaluation of environmental education in New Zealand schools. Vol. 2: A review of national and international research literature on environmental education practices.* Wellington: Ministry of Education.

Bolstad, R., & Baker, R., with Barker, M., & Keown, P. (2004). *Environmental education in New Zealand schools: Research into current practice and future possibilities. Vol. 2: A review of national and international research literature on environmental education practices.* Wellington: Ministry of Education.

Bolstad, R., Bull, A., with Carson, S., Gilbert, J., MacIntyre, B., & Spiller, L. (2013). *Strengthening engagements between schools and the science community: Final report.* Wellington: Ministry of Education.

Bolstad, R., Cowie, B., & Eames, C. (2004). *Environmental education in New Zealand schools: research into current practice and future possibilities. Vol. 1: Summary of the research findings.* Wellington: Ministry of Education.

Bolstad, R., Eames, C., Cowie, B., Edwards, R., & Rogers, N. (2004). *Environmental education in New Zealand schools: Research into current practice and future possibilities. Vol. 4: Case studies*

of environmental education practice in eight schools and kura kaupapa Māori. Wellington: Ministry of Education.

Bolstad, R., Roberts, J., & McDowall, S. (2009). *Education and enterprise: Learning at the interface. Final report from the Regional Education for Enterprise Clusters Evaluation.* Wellington: Ministry of Education and New Zealand Trade and Enterprise.

Brown, M. (2012). *Developing a place-based approach to outdoor education in Aotearoa New Zealand. Outdoor ed in our place: "Keepin' it real"*. Wellington: TLRI.

Carson, J. (2012). Case study: Rhode Street School, *Waikato Times*. Retrieved from http://www.stuff.co.nz/waikato-times/news/7716639/Case-study-Rhode-Street-School

Chalmers, J. (2011). *Education for Sustainability: An investigation of teachers' and students' perceptions and experiences* (Master of Education thesis, University of Waikato, Hamilton). Retrieved from http://hdl.handle.net/10289/5957

Cosgriff, M., & Gillespie, L. (2011). Assessment in senior outdoor education: A catalyst for change? *New Zealand Journal of Outdoor Education* (5), 7–22.

Cosgriff, M., Legge, M., Brown, M., Boyes, M., Zink, R., & Irwin, D. (2012). Outdoor learning in Aotearoa New Zealand: Voices past, present, and future. *Journal of Adventure Education and Outdoor Learning, 12*(3), 221–235.

Cowie, B., Eames, C., Harlow, A., Bolstad, R., with Barker, M., Keown, P., . . . Coll, R. (2004). *Environmental education in New Zealand schools: Research into current practice and future possibilities. Vol. 3: A critical stocktake of the characteristics of effective practice in environmental education in New Zealand schools and kura kaupapa Māori.* Wellington: Ministry of Education.

Cowie, B., Eames, C., Harlow, A., Bolstad, R., with Barker, M., Keown, P., . . . Coll, R. (2004). *An evaluation of environmental education in New Zealand schools. Vol. 3: A critical stocktake of the characteristics of effective practice in environmental education in New Zealand schools and kura kaupapa Māori.* Wellington: Ministry of Education.

Cowie, B., & Hipkins, R. (2014). Mediated conversations: A participatory method for generating rich qualitative data. *Sage Research Methods*. Retrieved from http://srmo.sagepub.com/view/methods-case-studies-2014/n395.xml

Davis, J. (2009). Revealing the research "hole" of early childhood education for sustainability: A preliminary survey of the literature. *Environmental Education Research, 15*(2), 227–241.

Department of Conservation. (2011). Benefits of connecting children with nature. Wellington: Author.

Department of Conservation Te Papa Atawhai. (2011). *Investing in conservation education for a sustainable and prosperous future. National Education Strategy 2010–2030*. Wellington: Department of Conservation Retrieved from http://www.doc.govt.nz/Documents/getting-involved/students-and-teachers/national-education-strategy-2010-2030.pdf.

Donaldson, G., & Donaldson, L. (1958). Outdoor education—a definition. *Journal of Health, Physical education and Recreation, 29*(5), 17, 63.

Eames, C., Barker, M., Wilson-Hill, F., & Law, B. (2010). *Investigating the relationship between whole-school approaches to education for sustainability and student learning. A summary*. Wellington: TLRI.

Eames, C., Law, B., Barker, M., Iles, H., McKenzie, J., Patterson, R., . . . Wright, A. (2006). *Investigating teachers' pedagogical approaches in environmental education that promote students' action competence.* Wellington: TLRI.

Eames, C., Roberts, J., Cooper, G., & Hipkins, R. (2010). *Education for sustainability in New Zealand schools: An evaluation of three professional development programmes summary report*. Wellington: Ministry of Education.

Eames, C., Wilson-Hill, F., & Barker, M. (2013). Exploring whole-school approaches to education for sustainability. *set: Research Information for Teachers, 1*, 12–19.

Elliot, J. (1994). Developing community-focused environmental education through action-research. In *Evaluating innovation in environmental education* (pp. 31–87). Paris: Organisation for Economic Co-operation and Development.

Elliot, J. (1995). Environmental education, action-research and the role of the school. In OECD/CERI (Ed.), *Environmental learning for the 21st century* (pp. 65–78). Paris: Organisation for Economic Co-operation and Development.

Elliot, J. (1999a). Environmental education: On the way to a sustainable future. In J. Elliot (Ed.), *Report on international ENSI conference* (pp. 5–38). Linz, Austria 3–7 October.

Elliot, J. (1999b). Sustainable society and environmental education: future perspectives and demands for the educational system. *Cambridge Journal of Education, 29*(3), 325–340.

Fien, J. (1994). Critical theory, critical pedagogy and critical praxis in environmental education. In B. B. Jensen & K. Schnack (Eds.), *Action and action competence as key concepts in critical pedagogy* (pp. 19–57). Copenhagen: Royal Danish School of Educational Studies.

Fien, J. (2000). Listening to the voice of youth: implications for educational reform. In D. Yencken, J. Fien & H. Sykes (Eds.), *Environment, education and society in the Asia-Pacific: local traditions and global discourses* (pp. 251–275). London: Routledge.

Fien, J., & Greenall Gough, A. (1996). Environmental education. In R. Gilbert (Ed.), *Studying society and environment—A handbook for teachers* (pp. 200–216). Melbourne: Macmillan.

Fien, J., & Tilbury, D. (1996). *Learning for a sustainable environment: An agenda for teacher education in Asia and the Pacific*. Bangkok: UNESCO/Asia-Pacific Programme of Educational Innovation for Development.

Flockton, J. (2013). *A comparative analysis of the implementation and impact of the New Zealand environmental curriculum in urban and rural schools.* (Master of Science in Environmental Management, University of Auckland, Auckland).

Gilbert, J., & Bull, A. (2013). *Building a future-oriented science education system in New Zealand: How are we doing?* Wellington: New Zealand Council for Educational Research.

Gough, A. (1997). *Education and the environment: Policy, trends and the problems of marginalisations*. Melbourne: The Australian Council for Educational Research.

Gower, B. (2011). *Educational Leaders Principals' Sabbatical report 2011* Wellington: Ministry of Education. Retrieved from http://www.educationalleaders.govt.nz/Leadership-development/Professional-information/Principals-sabbatical-reports.

Green, S. (2014). Sustainability ideas from Japan. *Tukutuku Korero New Zealand Education Gazette* 4–5.

Haines, L. (2012). Education for Sustainability in New Zealand secondary schools after the Introduction of the EfS achievement standards. *Directed Study STER 590-11D*: The University of Waikato.

Harcourt, M. (2011). Historical significance and sites of memory. *Set: Research Information for Teachers, 2*, 26–31.

Hill, A. M. (2011). *Re-envisioning the status quo: Developing sustainable approaches to outdoor education in Aotearoa New Zealand.* (Doctoral thesis, University of Otagpo, Dunedin). Retrieved from http://hdl.handle.net/10523/1954

Hipkins, R. (2013). The "everywhere and nowhere" nature of thinking as a subject-specific competency. *Thinking Skills and Creativity, 10*, 221–232. doi: http://dx.doi.org/10.1016/j.tsc.2013.05.006

Hipkins, R., & Spiller, L. (2012). *NCEA and curriculum innovation: Learning from change in three schools*. Wellington: New Zealand Council for Educational Research.

Irwin, D. (2010). *Weaving the threads of education for sustainability and outdoor education.* (Doctoral thesis, University of Canterbury, Christchurch). Retrieved from http://hdl.handle.net/10092/3637

Irwin, D., Straker, J., & Hill, A. (Eds.). (2012). *Outdoor education in Aotearoa New Zealand: A new vision for the 21st century*. Christchurch: CPIT.

Jackson, S. (2009). Enviroschools in New Zealand. *MAI Review 1* (Intern research report 5). Retrieved from http://www.review.mai.ac.nz/index.php/MR/article/viewFile/212/227

Jansen, C., & Boardman, E. (2011). Exploring education for sustainability in training outdoor educators. *New Zealand Journal of Outdoor Education, 2*(5), 23–34.

Jensen, B. B., & Schnack, K. (1997). The action competence approach in environmental education. *Environmental Education Research, 3*(2), 163–179.

Jensen, B. B., Schnack, K., & Simovska, V. (Eds.). (2000). *Critical environmental and health education: Research issues and challenges.* Copenhagen: Research Centre for Environment and Health Education, the Danish University of Education.

Kelly, J., White, J., with Dekker, M., Donald, J., Hart, K., McKay, F., . . . Wrig, G. (2013). *The Ngahere project: Teaching and learning possibilities in nature settings*. Hamilton: Wilf Malcolm Institute of Educational Research.

Lebo III, N. (2012). *Toward ecological literacy: A permiculture approach to junior secondary school.* (Doctoral thesis, University of Waikato, Hamilton). Retrieved from http://hdl.handle.net/10289/7392

Lucas, A. (1979). *Environment and environmental education: Conceptual issues and curriculum implications*. Sydney: Australia International Press and Publications.

Mackey, G. (2012). To know, to decide, to act: The young child's right to participate in action for the environment. *Environmental Education Research, 18*(4), 473–484.

MacTavish, J. (2011). *Films to change a climate: The power of narrative in promoting action competency on climate change amongst New Zealand youth.* (Master of Science Communication thesis, University of Otago, Dunedin). Retrieved from http://hdl.handle.net/10523/1720

Mardon, H. (2001). *New Zealand's country report to fourth UNESCO/Japan seminar on environmental education in Asia-Pacific region.* Wellington: UNESCO New Zealand.

Marshall, R. (2009). *Sabbatical report: Environmental education 2009*. Wellington: Ministry of Education. Retrieved from http://www.educationalleaders.govt.nz/Leadership-development/Professional-information/Principals-sabbatical-reports.

Matthewman, S. (2014). Clearing the ground for a greener New Zealand English. *English Teaching: Practice and Critique, 13*(11), 95–111.

Matthewman, S., & Morgan, J. (2014). Sharpening New Zealand's future focus. *set: Research Information for Teachers*(1), 24–32.

McClelland, T. (2000). *New Zealand's country report to fourth UNESCO/Japan seminar on environmental education in Asia-Pacific region*. Wellington: UNESCO New Zealand.

McKay, D. (2014). *Learning for survival, resilience, well-being and continuance: An epistemology and pedagogy for environmental education/education for sustainability informed by Māori culture.* (Doctoral thesis, University of Otago, Dunedin). Retrieved from http://hdl.handle.net/10523/4947

McRae, H. (2014). *Ngāti Whakaue Iho Ake—An iwi science education exploration.* Doctoral thesis, University of Victoria, Wellington) Retrieved from http://hdl.handle.net/10063/3667

Ministry of Business Innovation and Employment, Ministry of Education, & Office of the Prime Minister's Science Advisory Committee. (2014). *A nation of curious minds: He whenua hihiri i te mahara*. Wellington: New Zealand Government Retrieved from

http://www.msi.govt.nz/assets/MSI/Update-me/Science-in-society-project/science-in-society-plan.pdf.

Ministry of Education. (1996). *Te whāriki he whāriki mātauranga mō ngā mokopuna o Aotearoa: Early childhood curriculum*. Wellington: Learning Media.

Ministry of Education. (1993). *Science in the New Zealand curriculum*. Wellington: Learning Media.

Ministry of Education. (1999). *Guidelines for environmental education in New Zealand schools.* Wellington: Learning Media.

Minstry of Education. (2007). *The New Zealand curriculum.* Wellington: Learning Media.

Ministry of Education. (2008). *Te marautanga o Aotearoa*. Wellington: Learning Media.

Mueller, M., & Tippins, D. (Eds.). (2015). *Ecojustice, citizen science and youth activism*. Switzerland: Springer.

New Zealand Association for Environmental Education, Royal Forest and Bird Protection Society, Sustainable Living Education Trust, & the Enviroschools Foundation. (2014). *Education for a sustainable future. Election Manifesto July 2014*. Retrieved from http://nzaee.org.nz/wp-content/uploads/sites/21/2014/07/Election-manifesto-July-2014.pdf

New Zealand Curriculum Online (Producer). (2012). *Breaking down the notion of a subject based curriculum at Logan Park High School.* Retrieved from http://nzcurriculum.tki.org.nz/Secondary-middle-leaders/Media-gallery/Supporting-effective-teaching/Breaking-down-subject-based-curriculum

New Zealand Science Teacher. (2014). New funds boost environmental education programmes. *New Zealand Science Teacher*. Retrieved from http://nzscienceteacher.co.nz/news/new-funds-boost-environmental-education-programmes/#.VZMysfmqpHx

NZQA. (2008). *Education for sustainability: A commentary on preparation for the external achievement standards, Level 2*. Wellington: Author.

NZQA. (2009). *Education for sustainability: A commentary on preparation for the external achievement standards, Level 2*. Wellington: Author.

NZQA. (2010). *Education for sustainability: Commentary on preparation for the external achievement standards. Level 2*. Wellington: Author.

NZQA. (2011). *Assessment report: Education for sustainability Level 3*. Wellington: Author.

Orchard, R. (2014). Kids to run new environmental education project in Taupo. *Tukutuku Korero New Zealand Education Gazette, 93*(20), 2–4.

Penetito, W. (2004). *Theorising a "place-based" education.* Paper presented at the the NZARE conference, Wellington, November 24–26.

Pramling Samuelsson, I., & Kaga, Y. (2008). *The contribution of early childhood education to a sustainable society*. Paris: UNESCO.

Ritchie, J., Duhn, I., Rau, C., & Craw, J. (2010). *Titiro whakamuri, hoki whakamua. We are the future, the present and the past: Caring for self, others and the environment in early years' teaching and learning*. Wellington: TLRI.

Roberts, J., & Bolstad, R. (2010). *Organising for emergence: An exploratory study of the ReGeneration network. Final report prepared for Enviroschools*. Wellington: New Zealand Council for Educational Research.

Scott, W., Bruun Jensen, B., & Pereira, M. (1998). *Meta-analysis of EU-funded environmental education projects: A report to CEC-DGXI*.

Scott, W., & Reid, A. (1998). The revisioning of environmental education: A critical analysis of recent policy shifts in England and Wales. *Educational Review, 50*(3), 213–223.

Sustainability film challenge links to the curriculum. (2012). *New Zealand Education Gazette Tukutuku Korero, 91*(11), 2–3.

The Enviroschools Foundation. (2013). *Purongo 2012–2013: Celebrating progress*. Hamilton: Author.

The Enviroschools Foundation, New Zealand Association for Environmental Education, & WWF-New Zealand. (2011). *Thriving now for the future: Education for the 21st Century. Policy priorities for candidates in the 2011 New Zealand General Election.* Retrieved from http://assets.wwf.org.nz/downloads/efs_pre_election_manifesto.pdf

Tilbury, D. (1995). Environmental education for sustainability: Defining the new focus of environmental education in the 1990s. *Environmental Education Research, 1*(2), 195–212.

Tilbury, D. (2001). Reconceptualising environmental education for a new century. Author's manuscript cited pp. 1–17. *Topicos en educacion ambiental, 3*(7), 65–74.

Townsend, J. (2014). *Ko au te whenua, te whenua ko au—I am the land, the land is me: An autoethnographic investigation of a secondary school teacher's experience seeking to enrich learning in outdoor education for Māori students.* (Masters of Sport and Leisure Studies thesis, Waikato, Hamilton). Retrieved from http://hdl.handle.net/10289/9005

Tringham, K. (2007). Growth in sustainability. *New Zealand Education Gazette Tukutuku Korero, 14*(14), 15.

Vaeliki, S., & Mackey, G. (2008). Ripples of action: Strengthening environmental competency in an early childhood centre. *Early Childhood Folio, 12*, 7–11.

Wake, S. (2010). *The eco-classroom project: Fostering student participation through education for sustainability.* (Master of Education thesis, University of Waikato, Hamilton). Retrieved from http://researchcommons.waikato.ac.nz/handle/10289/5298

Wastney, M. (2014a). Examining a changing world: Teaching climate change in New Zealand. *New Zealand Science Teacher* (133), 14–16.

Wastney, M. (2014b). Steaming silverbeet and saving seed. *New Zealand Science Teacher* (133), 22–23.

Wellington Region Enviroschools Team. (2013). *Enviroschools and Te Aho Tu Rua: Wellington Region—Te Upoko o Te Ika. Snapshot 2013.*Wellington: Enviroschools

Wilson-Hill, F. (2006). Move over teacher: Sharing control of learning with our students using a transformative approach through education for sustainability. *set: Research Information for Teachers* (3), 2–6.

Appendix 1: Keywords used in the annotated bibliography

- action competence
- assessment
- climate change
- collaboration
- community
- conservation
- cross-curricular
- curriculum
- early childhood education
- eco-justice
- education for sustainability
- environment
- environmental education
- Enviroschools
- future focussed
- inquiry learning
- natural disasters
- neo liberal
- outdoor education
- PLD
- post-carbon
- primary
- secondary
- student achievement
- student engagement
- students as leaders
- sustainability
- teaching

Three other keywords further categorised items as:

- research
- evaluation, or
- commentary

Appendix 2: Information letter to workshop participants

Invitation to participate in a research workshop:
Update of Environmental Education activity

Dear colleague,

We invite you to take part in a half-day research workshop in [location] on [date and time] facilitated by Rachel Bolstad, Chris Joyce and Rosemary Hipkins from the New Zealand Council for Educational Research (NZCER). The workshop is part of a short, tightly focused review of environmental education that NZCER is undertaking for the Ministry of Education. You are being invited because of your role in and knowledge about environmental education practice in New Zealand.

The scope of the review

The Ministry of Education, the Department of Conservation and the Ministry for the Environment are working together to advance environmental education in New Zealand. They have agreed on a number of actions to actively engage young people in environmental education, one of which is to evaluate the current state of conservation/environmental education in New Zealand and consider this against international best practice. The broad aim is to identify barriers and opportunities in supporting environmental education in schools.

NZCER has been asked to provide a review of the current state of conservation/environmental education in New Zealand, how this stacks up against international best practice, and barriers and opportunities for supporting environmental education in schools. This work will help to update a large review of environmental education in New Zealand schools that was undertaken a decade ago by NZCER and the University of Waikato.

What we are asking of you

In these workshops we want to hear about current and recent practices New Zealand environmental education, and what those working in this sector see as the major trends, opportunities, and challenges for the development of environmental education.

Participation in the research is voluntary. We are able to meet your travel costs but we do not have the resources to recompense your time. However we really need to draw on the experience

and insight of people like you to complete this update within the time and resource constraints. If you agree to come you will be working with approximately 10–12 peers in the environmental education sector and the three of us.

How should you prepare for the workshop?

If you are happy to participate, we invite you to come **prepared to talk for up to 10 minutes** about a particular example or story from your work in environmental education that you think can add to our shared understanding of:

- the sorts of environmental education programmes currently or recently taking place in schools around NZ, and where good examples can be found
- the key trends and developments across the last decade, and as you look forward to the future
- any concerns and issues you see as important and why

The stories and examples the group hears will form the basis for small-group discussions facilitated by the NZCER team.

What will happen to the data from the workshop?

We will be taking notes through the workshop and possibly recording conversations in order to write up a summary of the discussions. This summary will be sent back to all workshop participants. Qualitative data and themes from these workshops will be incorporated into the research report that we will prepare for MOE by April 2015. The report will also draw together the workshop insights and key messages from other research and literature. We have already begun searching for the latter and will gratefully receive any seminal references you wish to share.

Information we gather from participants will be pooled in the report and we do not intend to use any participants' names in the reports we write. However, some of your contributions may be identifiable to those who know you and your work. If you wish, you can ask to be named in the acknowledgements page of the report.

What next?

If you are happy to be part of the research project please rsvp by return e-mail so that we can make the necessary arrangements.

Please complete the attached consent form and give it to one of us at the workshop.

If you have any questions or require any clarifications about this work please feel free to contact one of us before deciding whether to take part.

Rachel Bolstad (project leader) Rachel.bolstad@nzcer.org.nz

DDI: 04 802 1382

Chris Joyce (leading the literature review) chris.joyce@nzcer.org.nz

Rosemary Hipkins (project sponsor) rose.hipkins@nzcer.org.nz