

**Learning for Sustainability: The Role and Impact of Outdoor and  
Environmental Education Centres  
Progress Report October 2005**

## **Background**

Learning for Sustainability: The Role and Impact of Outdoor and Environmental Education Centres is a two year ARC Linkage Project conducted by researchers Professor Roy Ballantyne and Dr Jan Packer from the University of Queensland with partner, Education Queensland. This project is contributing to the National Research Priority for an Environmentally Sustainable Australia by addressing the effectiveness of educational interventions in Outdoor and Environmental Education Centres (O&EECs). Specifically, this project is investigating the factors that contribute to effective education and learning for sustainability in the programs of 23 Outdoor and Environmental Education Centres. The study has been conducted in two main phases over the two year period.

This document reports on the main outcomes achieved in 2005; the findings from the telephone interview with Principals; the results of the online survey; details of the fieldwork component of the study in 2006; and the project timeline from November 2005 to December 2006.

## **Outcomes achieved in 2005**

Five main outcomes have been achieved in 2005.

1. Data have been collected from Principals of 23 participating Centres through telephone interviews and two surveys (an online questionnaire; and an overview of programs survey). This data have provided a large amount of information about the type and nature of program provision; principals' perceptions of success factors in their programs and pedagogy; and forms the basis for the selection of specific programs for the in-depth study of student environmental learning outcomes in 2006.
2. Two key instruments to measure student learning in 2006 have been developed and piloted. These are the Environmental Learning Outcomes Survey (ELOS) and the Student Observation Schedule (SOS). The ELOS is a structured interview schedule which will be used to gather information about students' environmental learning immediately following their participation in a program. The ELOS will be administered again to students will be interviewed approximately three months after the initial administration. The SOS will be used to systematically observe and record patterns of student behaviour during an environmental education program.
3. Qualitative data from the telephone interviews with 23 O&EEC principals have been analysed. A research paper based on the findings is to be submitted to a refereed journal.

4. Data from the online survey and the overview of program surveys have been analysed in terms of the scope and nature of programs. From this information we have identified 12 programs from the nine participating Centres that will be the focus of Phase 2 which is an in-depth study of the role and impact of O&EEC programs on students' learning for sustainability. This will be conducted in 2006.
5. Information gathered from Centre Principals in 2005 is being collated for a database. Programs will be annotated according to aims, target student groups, dominant pedagogies, expected outcomes and partnership approaches. This database will be made available to industry partner, Education Queensland for use by Principals and staff of O&EECs, and other Education Queensland personnel

## **Phase 1: Documenting the range of pedagogies and partnerships used by O&EECs**

### **Summary of findings from Principals interviews**

Qualitative data from the interviews with O&EEC principals have been analysed and form the basis of a research paper to be submitted to a refereed journal. The analysis of the interviews revealed that principals and staff from O&EECs are strongly committed to strengthening environmental education / education for sustainability in Queensland schools through their programs. Centres use a wide range of programs and pedagogies and are supported by staff with high levels of skill, experience and commitment to environmental education / education for sustainability. These programs are designed for students to achieve learning outcomes that are consistent with environmental education goals and include: increasing students' knowledge of natural systems, environmental issues and human impacts; fostering environmental values and sensitivity; and promoting an action orientation to address environmental problems.

In addition, O&EEC principals and staff aim to build the capacity of classroom teachers to develop their skills, knowledge and commitment to environmental education in order to integrate environmental education programs in school and classroom contexts. Partnerships with schools are cultivated through involving and supporting classroom teachers in the planning-implementation-follow-up cycle as much as possible. A number of Centres are promoting whole-school approaches to environmental education and on-ground sustainability programs in the school environment (e.g. energy efficiency, recycling, water conservation). Principals identified a number of challenges / barriers to maximising successful learning for sustainability programs. These are time and distance issues; lack of classroom teacher interest and commitment; demand issues; staffing and resource issues; limitations of short-term provision; and matching student needs to programs.

## **Phase 2: Investigating the impact of O&EEC pedagogies and partnership approaches on student learning for sustainability**

On the basis of data collected in Phase 1, twelve O&EEC programs from nine Centres will be selected for the case studies in 2006. These include Centres from both metropolitan and regional locations. In 2006, the study will involve:

- Structured interviews with students, Outdoor and Environmental Education staff, and classroom teachers immediately following the environmental educational program, then three months after the program will provide a measure of students' learning outcomes.
- Structured observations of students engaged in selected environmental education programs will also be conducted during this phase.
- This information will be used to identify the components of programs and pedagogies that are most effective in determining environmental learning for sustainability outcomes.
- The outcomes of this study will provide indicators of best practice, which will be of direct benefit to the Centres that are the focus of this study, as well as having broader application to environmental education program development and practice.

Selection of the 12 programs is being made on the basis of the following criteria:

	<b>No pre or post component</b>	<b>Either pre OR post component</b>	<b>Both (pre AND post component)</b>
<b>Primary Years 5 -7</b>	Program 1 Program 2	Program 5 Program 6	Program 9 Program 10
<b>Secondary Years</b>	Program 3 Program 4	Program 7 Program 8	Program 11 Program 12

We will be contacting the nine participating Centres later this year and in early 2006 to organise suitable times to visit Centres to gather this information. We aim to conduct the fieldwork in the following periods in 2006:

- April - 24 June;
- 11 July – 22 September
- 9 Oct – mid November

The Fieldwork involves:

<b>Measure</b>	<b>Initial fieldwork</b>	<b>Follow-up (2-3 months later)</b>
Environmental Learning Outcome Survey (ELOS) – structured interview which investigates what students have learned and the components / circumstances that lead to their learning.	Interviews with students (individually) on site or at school shortly after student participation in program Administered at school by university researcher	Administered at school by university researcher (all follow-up data collection will be completed by mid November)

Student Observation Schedule (SOS).	On-site observation of students' (group) behaviour during their participation in program Administered at school by university researcher	NA
Interviews with Centre staff (principal, teachers)	Shortly after program implementation Administered at school by university researcher	NA
Interviews with Classroom teacher	Shortly after program implementation Administered at school by university researcher	NA

## Online Survey Findings

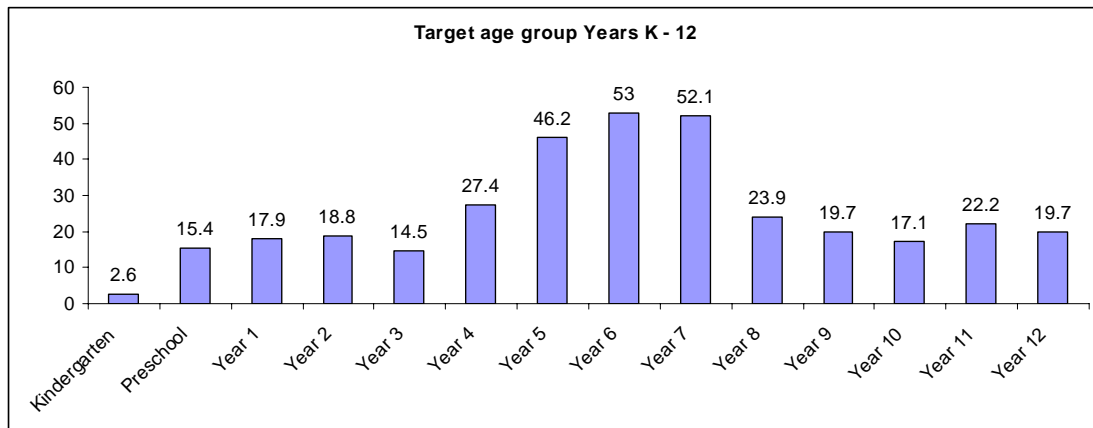
The Online Survey is a questionnaire designed to capture detailed information about the nature of selected programs offered by Centres. Principals were asked to supply information on their programs. Data was received from 16 Centres on 117 programs. This is provided in Table 1.

**Table 1.**

Code	Centre	No. programs
2026	Wanpa-rda	3
2260	Toohy Forest	11
3550	Maroon	9
3552	Jacobs Well	10
3554	Brisbane Urban	2
3555	Tallebudgera	1
3556	Bunyaville	11
3561	Boyne	10
3562	Barambah	4
3565	Pullenvale	10
3567	Moreton Bay	10
3568	Paluma	9
3582	Holloways	10
3583	Tinaroo	10
3590	Nudgee Beach	4
3559	Sunday Creek	3
<b>Total</b>	<b>16</b>	<b>117</b>

Shaded cells indicate centre participating in Phase 2 of the study

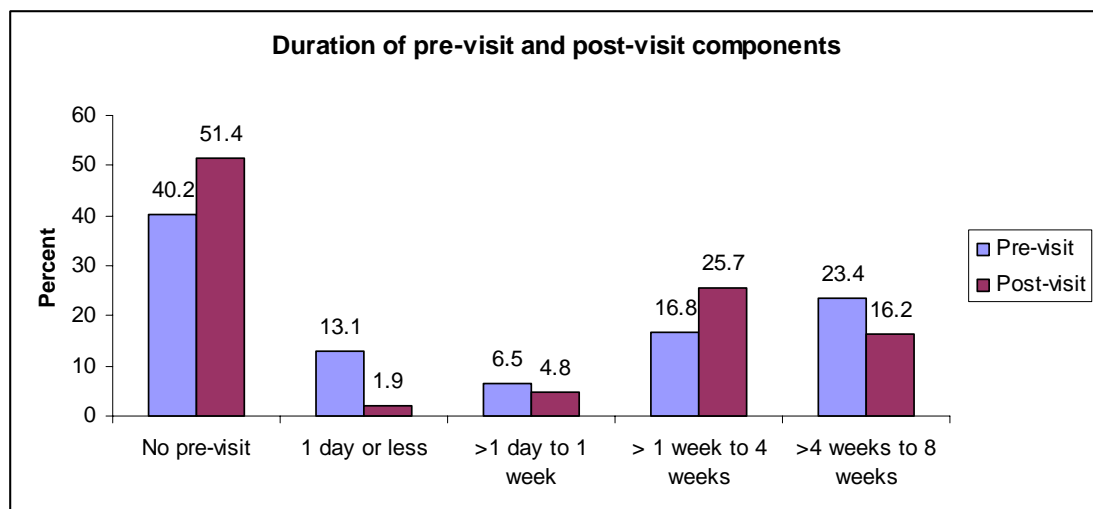
The survey asked about the target age group at which Centre programs were aimed. As Figure 1 shows, the upper primary years were the most frequently targeted age groups of the programs surveyed in the online questionnaire. Programs were least often targeted at kindergarten age children (2.6%).



**Figure 1. Target age group of Centre programs**

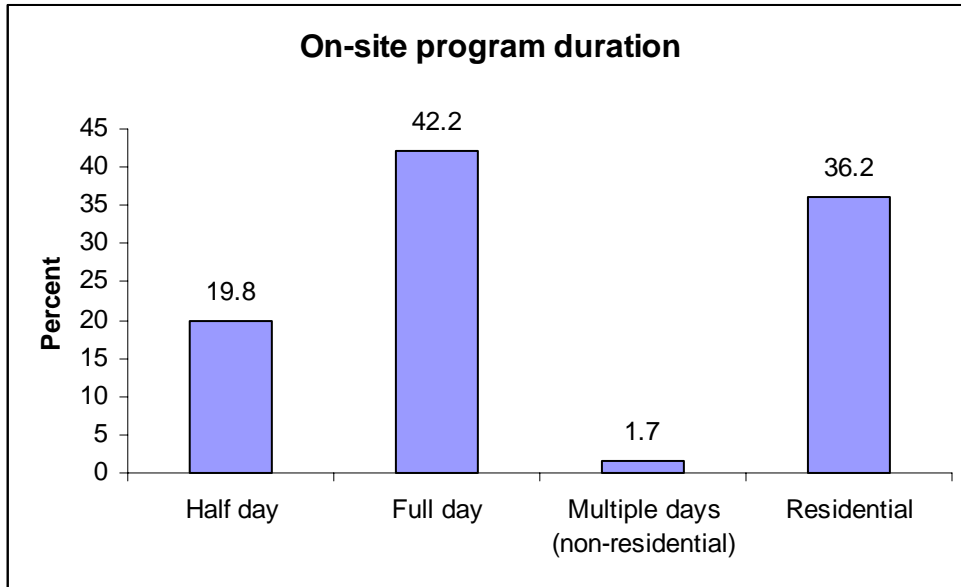
### **Duration of pre-program visit, on-site, and post-visit components of programs**

Principals were asked to indicate the duration of the pre-program visit component, if any. As Figure 2 shows, a large percentage of programs had neither a pre-visit or post-visit components, with 40 percent of programs with no pre-visit component and over half of the programs offering no post-visit component. Figure 2 also shows that almost one quarter of programs had pre-visit components that ran for more than four weeks, while one quarter of programs ran post-visits for one to four weeks.



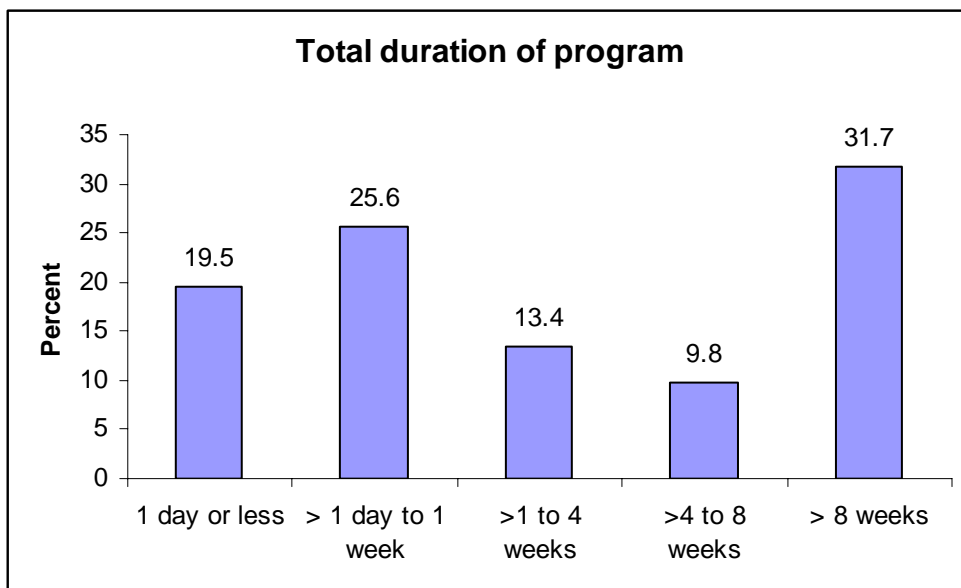
**Figure 2. Duration of pre-visit and post-visit components**

Principals were asked to indicate the duration of the on-site component of their programs. As Figure 3 shows, 42 percent of programs are one day's duration, while over one third of programs were residential. Just under 20 percent of programs lasted for half a day.



**Figure 3. Duration of onsite program**

Principals were asked to indicate the total duration of their programs. As Figure 4 shows, the total duration of approximately 45 percent (19.5% and 25.6%) of programs was one week or less. However, just under one third of programs lasted more than eight weeks. In some cases, programs could last the entire school term (i.e. up to 14 weeks).



**Figure 4. Total duration of program**

Principals were asked to indicate the main content areas of the each of the on-site programs. Percentages are provided in Table 2. The results show that Queensland O&EECs teach across a broad range of content areas. People and the environment was the most frequently nominated content area (33.3%), followed by Ecosystems / biodiversity (29.1%), Sustainable living (25.6%), and Personal development (25.6%). The least frequently nominated content areas were Tourism (0.9%) and Astronomy (1.7%).

**Table 2. Percentage of programs by content area**

Content area	%	Content area	%	Content area	%
Catchment studies	16.2	Resource/land management	12.0	Environmental history	3.4
Forest studies	12.0	Sustainable development	9.4	Local history	8.5
Marine studies	17.9	Sustainable living	25.6	Local geography	4.3
Urban environments	5.1	Energy efficiency	3.4	Tourism	0.9
Ecosystems/biodiversity	29.1	Waste minimisation	6.8	Personal development	25.6
Animals	20.5	Monitoring (e.g. Waterwatch)	3.4	Physical/outdoor activity	15.4
Plants	3.4	Aboriginal studies	6.0	Creative expression	5.1
Astronomy	1.7	People and the environment	33.3	Other	4.3

The online survey asked to what extent are links made to the school curriculum during the on-site program. Responses were rated on a seven point scale which ranged from not at all (1) to a lot (7). Not surprisingly, the curriculum areas of Studies of Society and Environment and Science were most strongly represented in terms of links made to the curriculum, while History and Mathematics were least represented. The mean and standard deviations are provided in Table 3 below.

**Table 3. Means and standard deviation of links made to the school curriculum**

Curriculum area	Mean (SD)	Curriculum area	Mean (SD)
SOSE	5.40 (2.29)	The Arts	2.16 (2.40)
Science	4.40 (2.68)	History (Secondary)	0.85 (1.17)
Mathematics	1.53 (1.76)	Geography (Secondary)	1.15 (2.22)
Health & Phys. Ed	2.77 (2.55)	Early Years / Preschool	1.89 (2.57)
English	3.28 (2.67)	New Basics	1.67 (2.26)
Technology	2.47 (2.40)	Other	0.67 (1.91)

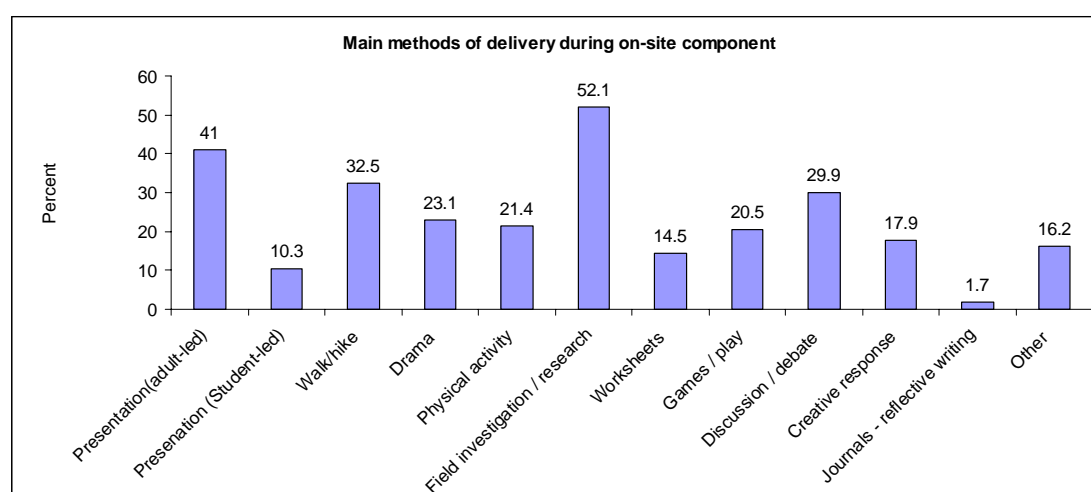
Principals rated the goals of their programs on a seven point scale ranging from not a goal (1) to major goal (7). Results are provided in Table 4. The high means in Table 4 indicates that O&EEC principals considered these to be important goals. Raising students' awareness of the environment, developing students' environmental attitudes and developing students' environmental knowledge were rated most highly.

**Table 4. Means and standard deviations of program goals**

Program goals	Mean (SD)
Raising students' awareness of the environment	5.74 (1.87)
Increasing students' environmental knowledge	5.53 (2.01)
Developing students' environmental attitudes	5.68 (1.91)
Developing students' environmental skills	4.54 (2.29)
Getting students to consider the impact of their environmental behaviour	5.40 (2.03)
Motivating students to take action to care for the environment	5.37 (2.12)

Promoting students' personal development and self-discovery	4.85 (2.11)
Extending students' critical thinking skills	4.93 (1.99)
Developing students' social skills	4.21 (2.33)
Helping teachers adopt strategies to promote environmental learning	4.33 (2.21)
Other	0.38 (1.52)

Outdoor and Environmental Education Centres use a range of methods in delivering their programs. Figure 5 provides the percentages of methods of delivery for the programs surveyed. As can be seen from Figure 5, field investigation / research activities were the main method of delivery in over one-half of the programs surveyed, while adult-led presentations comprised the second most frequently used method of delivery. As Figure 5 shows, a wide range of pedagogical approaches are used in the delivery of the on-site programs surveyed. Walking / hiking, discussion / debate, and drama (including story thread approach, role play, and performance) were also frequently reported. The least frequently reported method was journal writing.



**Figure 5. Main methods of delivery during on-site component**

Principals were also asked about the extent to which their programs incorporate the components of the productive pedagogies. Principals rated the productive pedagogies items from 1 (not at all) to 7 (a lot). Means and standard deviations are provided in Table 5 a, b, and c below. The three most highly rated pedagogies were Connectedness to the World (6.13), Academic Engagement (6.00), and Inclusivity (5.60), while Social Support, Self-regulation, Problem-based Curriculum, Substantive Conversation, Active Citizenship had means higher than 5.00 (See Table 5a and 5b). For the other environmental education pedagogies (See Table 5c), The means for Range of Learning Styles, Emotional Engagement, Cooperative Learning, and Empowerment were also greater than 5.00.

**Table 5a. Mean and standard deviations of Productive Pedagogies**

Intellectual quality	Mean (SD)	Recognition of difference	Mean (SD)
Higher-order thinking	4.89 (2.07)	Cultural knowledge	4.00 (2.27)
Deep knowledge	4.74 (1.78)	Inclusivity	5.60 (1.95)
Deep understanding	4.67 (2.01)	Narrative	3.51 (2.49)
Substantive conversation	5.04 (1.65)	Group identity	4.40 (2.36)
Knowledge as problematic	4.22 (2.05)	Active Citizenship	5.03 (2.26)
Metalanguage	2.66 (1.83)		

**Table 5b. Mean and standard deviation Productive Pedagogies**

<b>Connectedness</b>	<b>Mean (SD)</b>	<b>Supportive classroom environment</b>	<b>Mean (SD)</b>
Knowledge integration	4.67 (2.23)	Student direction	4.06 (2.37)
Background knowledge	4.93 (1.90)	Social support	5.51 (1.82)
Connectedness to the world	6.13 (1.57)	Academic engagement	6.00 (1.40)
Problem-based Curriculum	5.13 (2.18)	Explicit quality performance criteria	3.19 (2.06)
		Self-regulation	5.34 (1.57)

**Table 5c. Other pedagogies relevant to environmental education**

<b>Pedagogy</b>	<b>Mean (SD)</b>
Ownership	4.80 (2.26)
Empowerment	5.02 (2.33)
Environmental investigation	4.80 (2.25)
Action skills building	4.13 (2.36)
Cooperative learning	5.15 (2.07)
Creative thinking	4.85 (1.89)
Emotional engagement	5.23 (1.98)
Range of learning styles	5.27 (1.89)
Metacognition	2.97 (2.17)
Reflection	4.61 (2.25)

The online survey also asked principals to indicate the kind of support that classroom teachers who participate in the program receive from the Centre. Results are provided in Table 6 below. Table 6 shows that pre-visit telephone calls and orientation materials were the main type of support that classroom teachers receive from Centres. Pre-visit teaching activities were also frequently used as were links to the Curriculum. Post-visit telephone calls were used for less than 10 percent of programs.

**Table 6. Type of support classroom teachers receive from Centres**

<b>Type of support</b>	<b>Percent</b>
Orientation materials	70.9
Pre-visit teaching activities	61.5
Pre-visit telephone discussions with teachers	76.9
Classroom pre-visit by Centre staff	33.3
Post-visit teaching activities	44.1
Post-visit telephone discussions with teachers	9.4
Classroom post-visit by Centre Staff	12.0
Curriculum links	61.5
Professional development activities for teachers	19.7
On-line teaching support materials	42.7
Other	17.9

The online survey also asked respondents to indicate which methods are used to evaluate the effectiveness of the program. The percentage of responses is provided in Table 7 below. As Table 7 shows, for the majority of programs, evaluations were in the form of classroom teacher questionnaires or interviews. Student questionnaires or

interviews were the second most frequently used method of evaluation. Only six percent of programs do not use any method of evaluation.

**Table 7. Method of evaluation for Centre on-site programs**

<b>Method of evaluation</b>	<b>Percent</b>
Teacher questionnaires or interviews	83.8
Student questionnaires or interviews	62.4
Centre staff questionnaires or interviews	22.2
Comment books	16.2
Letters from students	35.0
Measurement of learning outcomes	12.8
No evaluation	6.0
Other	15.0

### Overview of programs survey

Principals and Centre staff completed an Overview of Programs Survey in which they were asked to provide information of up to ten programs. Data were received from 19 centres. All centres participating in Phase 2 completed the overview of programs survey. This is provided in Table 8.

**Table 8.**

<b>ID Number</b>	<b>Centre</b>	<b>No. programs</b>
1	Barambah	11
2	Boyne Island	36
3	Bunyaville	14
4	Holloways	10
5	Maroon	8
6	Nudgee Beach	42
7	Pullenvale	14
8	Sunday Creek	N <sup>a</sup>
9	Toohy Forest	10
10	Bilai	10
11	Brisbane Urban	21 <sup>a</sup>
12	Coolumboola	56 <sup>a</sup>
13	Daradgee	6
14	Jacobs Well	10
16	Moreton Bay	10
18	Numinbah	27 <sup>a</sup>
19	Paluma	7
20	Stanley River	20
21	Tallebudgera	5
22	Tinaroo	19
23	Wanpa-rda Matilda	6
<b>Total<sup>b</sup></b>	<b>19</b>	<b>238</b>
<b>Total<sup>c</sup></b>	<b>22</b>	<b>342</b>

a = information collected from website

b = (excluding web derived data)

c = (including web derived data)

Shaded cells indicate centre participating in Phase 2 of the study

## Timeline 2005-2006

Tasks	Staff	Fortnight commencing:																
		3 Oct	17 Oct	31 Oct	14 Nov	28 Nov	12 Dec	26 Dec	9 Jan	23 Jan	6 Feb	20 Feb	6 Mar	20 Mar	3 Apr	17 Apr	1 May	15 May
TEAM MEETING	NR RT RB JP PS	x			x						x				x			
Select programs for Stage 2 case studies	RB, JP, CM		x	x	x													
Produce descriptive statistics on programs and pedagogies	PS JP			x	x													
Finalise Principals Interview Paper	PS	x	x	x	x													
Pilot test Stage 2 data collection instruments	JP PS NR	x																
Refine Stage 2 Measures: Class observation schedule; Environmental Learning Outcome Interview Schedule	RB, JP, PS		x	x	x													
Commence liaising with Centres for data collection in 2006	PS		x	x	x													
<u>Setup</u> project website	PS / <u>new SRA</u>				x					x	x							
Prepare report for findings of Stage 1	PS			x	x	x												
Report findings of Stage 1	PS RB JP				x		x											
Preparation for Stage 2 Contacting schools	PS, <u>new SRA</u>			x						x	x	x	x					
<u>Create data file for Overview of Programs survey</u>					x					x	x							
Stage 2 Data collection	New SRA RB JP											x	x	x		x	x	x

**2005-2006 Project timeline continued**

Tasks	Staff	Fortnight commencing:																
		29 May	5 Jun	19 Jun	3 July	17 July	7 Aug	21 Aug	4 Sept	18 Sept	2 Oct	16 Oct	30 Oct	13 Nov	27 Nov	11 Dec	25 Dec	
TEAM MEETING	NR RT RB JP	x					x					x				x		
Stage 2 Data Collection	Senior Research Assistant	x	x	x		x	x	x	x	x		x	x	x				
Commence analysis of data from Phase 2	Senior Research Assistant; JP			x	x	x				x	x	x		x	x	x		
Report findings from Phase 2	RB JP Senior Research Assistant															x		

