Abstract

in Canterbury, native forests are now less than 2% of what they originally were. To gather the information required for analysis an online survey and face-to-face interviews were conducted. Data from the online survey that targeted 114 primary schools throughout the Christchurch region, and in-depth interviews with 10 school principals chosen from those schools, of which 8 participated, suggests that the school curriculum is flexible in how biodiversity is taught in schools. The survey results also revealed that schools are interested in working with Trees for Canterbury to better teach children the importance
biodiversity. The interview responses showed that principals understand the importance of hands on learning to teach children about native trees and the use of technology as another means of interactive learning. Limitations for the research include human factors such as filling out of the survey forms in a way that may not be truly indicative of the facts, understanding of the questions asked and ethics, that is, due to ethical considerations we were unable to talk to school aged children directly. Future research for the project would be a feasibility study assessing where there would be suitable locations
location is the most appropriate and a Canterbury w

Key words: biodiversity, education, New Zealand school curriculum.

Table of Contents

1. Introduction

The impact of urbanisation throughout the world has altered former large areas of natural habitat to the point of destruction and fragmentation. Urbanisation of much of the planet is incredibly prevalent with at least half o

year 2010. This is expected to be fast approaching 69% by the year 2050 (United Nations, 2011). Furthermore, it has rapidly become apparent that the effects of urbanisation have displaced much of the native fauna and flora that once inhabited the regions where cities are now located. This occurrence of urbanisation has an effect in many biodiversity hotspots worldwide and has been acknowledged as the major cause of decline in endangered species globally (Millar & Hobbs, 2002). Also Lerman et al. (2012) identified that urbanisation had at this time impacted on the homogenisation of urban diversity. A study in Southern Australia indicated that the restoration of habitats regarding re-vegetation plantings of different structure and floristics were specified as re-establishing bird communities. These restorations attract different species of avifauna to certain areas of reclaimed native remnants (Munro et al., 2011), this is turn allows for increased biodiversity, closely resembling what was originally present. The deforestation of several vegetated high density areas has put pressure on and has expedited the extinction of many of the planets unique biota. As a consequence, it would be in the best interest of those concerned to assess the effects of urbanisation on biotic communities and facilitating changes in public perception. Since urban development is expected to increase in both scope and magnitude, knowledge about how the urban ecosystem functions will be useful in planning future urban developments that could minimise

cultural and ecosystem values. It has been well acknowledged that people in general are ignorant to different species of both native flora and fauna, therefore, educating them on their variation may be all that is needed to boost the prevalence of native woody species on private land. Doody et al. (2010) ascertained that although the public was supportive in the propagation of native plants, people were ignorant to the visual appearance of native flora and therefore eliminated native species from their gardens that would otherwise have self-propagated. Doody et al. (2010) also found the public were quick to remove self-seeding native plant life when they did not grow in desired locations. Stewart et al. (2004) determined that there is more prevalence of native trees on private land in the suburb of Opawa when compared with that of Fendalton, despite Fendalton properties having a much greater land area. However, according to Doody et al. (2010) and Stewart et al. (2009) higher socio-economic communities had higher native plant diversity, and that public education and knowledge of native plant species would benefit both the ecological and social aspects of society.

Trees for Canterbury, henceforth referred to as T4C, are a non-profit organisation aspiring to deliver native trees to the province of Canterbury. When the early settlers inhabited Christchurch their preference for the English style gardens was considered more aesthetically pleasing than the natural habitat, but over the last 20 years there has been a greater acceptance of native plants. This is highlighted in work already noticeable throughout Christchurch and Canterbury

was that schools closer to the periphery of the outskirts of the city were more likely to be about native ecosystems. We also were of the belief that a higher decile school would be more responsive to interaction with T4C. Therefore, we hypothesised that:

1. Higher decile schools are likely to have greater funding and resources so are more likely to participate in extra-curricular activities including visiting venues such as Trees for Canterbury.
2. Primary schools further from the CBD would have much more interaction with native ecosystems because of a greater accessibility to rural areas.

The objective of this study is emphasised in our main research question:

> What determines attitudes and knowledge of native ecosystems in primary schools within the Christchurch region?

Most of the articles reviewed in this research are in reference to New Zealand, but they are applicable to many nations and the theories have relevance to most situations. Although most of our literature that is cited has been authored by New Zealand academics, there are a few international examples that have also provided an outside perspective.

2. Methods

T4C already has a working relationship with some primary schools; therefore we chose to omit these from our study. In order to obtain a representative sample, primary schools within

We approached school principals in order to determine what pupils were being taught within the classrooms with regard to native landscapes and fauna. To ascertain social geographical statistics, two methods were used to capture data and these comprised of an online survey and short interview. We approached the 114 schools via email by sending them an introductory letter introducing ourselves, our course of study and explaining why our research was important to the community. A survey of 10 questions was sent to these schools, with questions ranging from informing to investigative. The 10 question survey was distributed in the form of an online electronic questionnaire via www.docgoogle.com. The survey was conducted as a ratio scale with some questions ranging in scale from 1-4 and others from 1-5 dependent on question type.

A GIS map was generated to investigate if there were any visual correlations between school

co-efficient was used to ascertain whether there was a relationship between survey answers and school decile. We also selected 10 of the schools to participate in a short five question personal interview to collect qualitative data. The 10 schools were randomly selected from five categories, in order to control for bias, two fr

(figure 1 c) and birds (figure 1 d), results show that children are more likely to distinguish native from exotic birds with only 6% (n=4) indicating never, than they are for native and exotic plants with 19% (n=13) of schools not able to verify whether or not their children could distinguish the difference and 4% (n=3) stating that they could not. This implies that there is indeed scope for implementing educational and informative practical approaches within the majority of schools that have responded to the survey. If successful natural regeneration of our native forests is to occur, it would require intervention from anthropogenic influences (Doody et., 2010). This could indeed be a precursor to aiding in natural regeneration of fragmented native forests, through educating and training younger generations about native ecosystems. Although most of these questions addressed and

about diversity and the importance of restoration that will determine how our ecosystems will persist in the future (Doody et al., 2010; Stewart et al., 2009).

In addition to assessing what children may already know about native flora and fauna, we

ta, this has been documented as being a precursor to facilitating biodiversity restoration (McKinney, 2002). This was achieved by devising questions that we considered to be both thought provoking and informative.

was surprising to find that 55% of schools rarely visited native natural environments. This is definitely an area that needs to be addressed and in itself presents an ideal niche opportunity that T4C could utilise to aid in educating school children of native forests. This in turn may also enhance profile. This could be achieved by informing children about natural corridors, how they operate and how they can contribute to the creation of these by encouraging them to grow natives in their own backyards.

As it has been suggested, the creation and maintenance of natural corridors are paramount to ensuring that urban biodiversity thrives (Lerman et al., 2012). Nectar feeding songbirds were reported to be seen or heard in 83% (n=56) of schools surveyed, with only 17% (n=12) of schools indicating that they were never present (figure 2b). As bellbirds are more often associated with native flora it could be suggested that many of the schools that responded are in proximity to or may have natives growing within their school grounds. Other native birds were determined to be absent from 17% (n=12) of schools surveyed with 43% (n=29) reporting they were present sometimes or often and 40% (n= 27) stating that they were seldom in the area (figure 2 c). These

None of the schools surveyed have visited T4C often, however 59% (n= 40) have visited sometimes or seldom and 40% (n=27) have never visited T4C, only 1% (n=1) had responded that they have never heard of them (figure 3a). Conversely, when asked if schools would consider having T4C visit them, 94% (n= 65) were open to visits, and 16% (n= 11) answering often, however 6% (n= 4) stated that they had never heard of them (figure 3 b). Raising awareness of T4C, particularly in the Christchurch area would quitof

is concerning. This is an area that T4C could assist schools with educating children on identification of natives. Promoting this aspect could increase enthusiasm for T4C-school interaction. T

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might encourage schools to become more involved with T4C. This would serve to also incorporate the area mentioned in the interviews where schools stated that they prefer to be

within the last ten years, schools are now able to customise their science content to include

that primary schools further from the CBD would have much more interaction with native ecosystems because of a greater accessibility to rural areas. However, these findings could be compromised due to the fact that the 2006 census was lacking in some data, this meant that not all schools were listed.

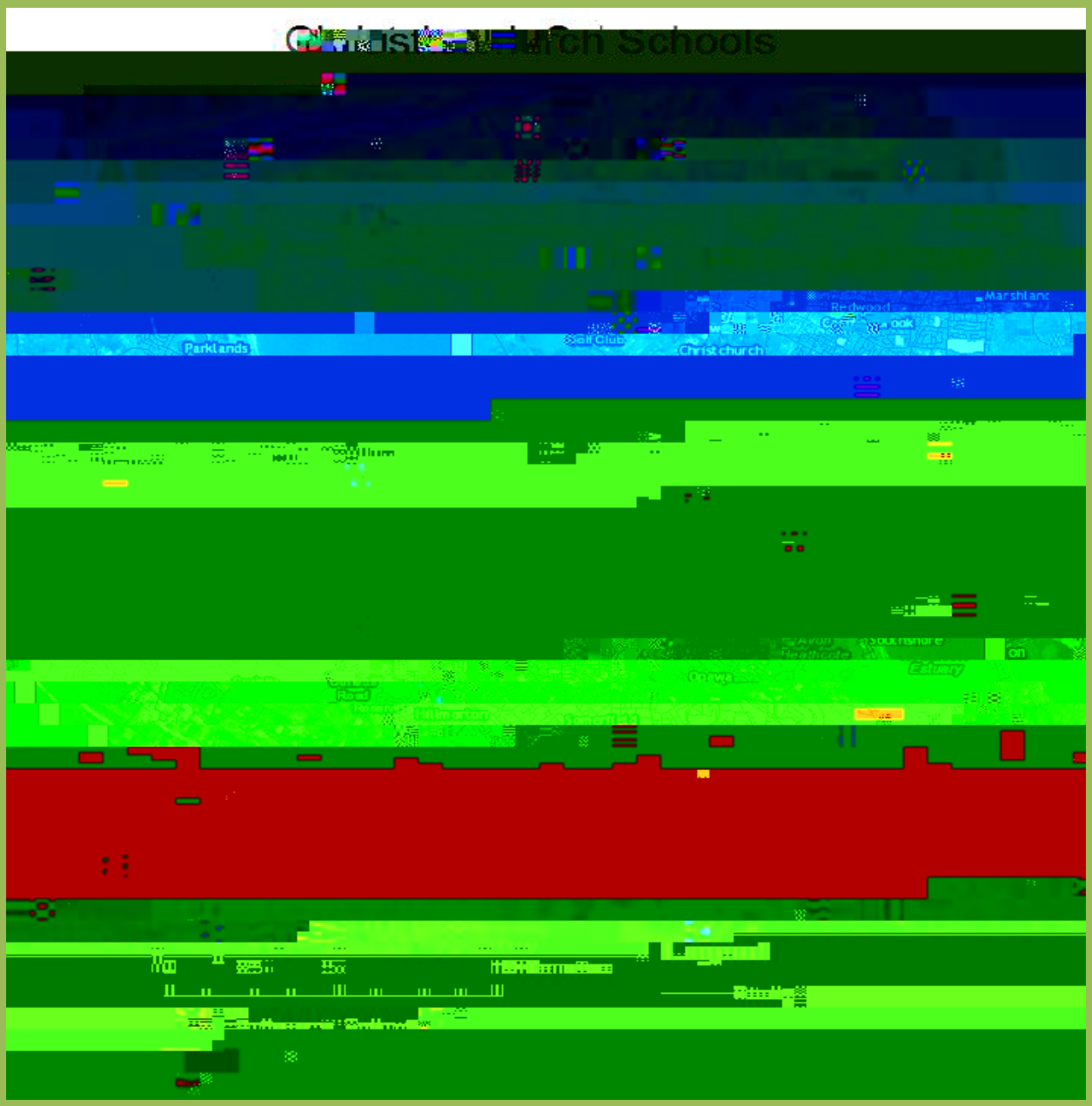

Figure 3: Map of Christchurch depicting respondent schools in pink and non-participants in grey. Note that non-respondents also incorporate secondary schools which were not invited to participate in the study.

As people are becoming increasingly environmentally aware, this presents the perfect opportunity for T4C to become more proactive within communities and schools alike. Catch phrases such as reduce, reuse, recycle are becoming prominent shibboleths in the public realm (The Guides Network, n.d.), and therefore this is the perfect opportunity for T4C to

In general it appears that most schools would be amenable to developing a relationship or increasing involvement with T4C. This is evident in responses that we received for the survey questions and also for comments made in the interviews. The majority of schools surveyed indicated that they were unaware of the type of interactive repertoire that T4C provided. This suggests that raising awareness of the products and services that T4C provide would increase involvement with schools, and possibly spill over to the general public.

4. Limitations

5. Recommendations

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