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Using Environmental Interventions to Create Sustainable Solutions to Problems of Health and Wellbeing

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Recent research by Deakin University, in collaboration with Parks Victoria and its Strategic Partners, indicates that contact with nature may promote human health and wellbeing. International research indicates that simply viewing a natural scene or watching wildlife reduces stress and tension, improves concentration, remedies mental fatigue, boosts immunity, and enhances psychological health. This is aside from any physical health benefits flowing from reduced stress, increased exercise and improved air quality when contact with nature involves activities in natural environments. The literature suggests that interacting with nature through gardening or having a companion animal is also beneficial for health, and where these activities involve contact with other humans, might extend benefits beyond the individual to the community, through enhanced social capital. This paper sets out the potential scope of work flowing from the initial research, in terms of target groups, research foci, intervention strategies, and likely benefits, and reports on progress in establishing a program of Australian-based empirical research. It proposes the establishment of alliances between researchers and practitioners in a range of disciplines (including environmental health) to ensure that the links between contact with nature and human health and wellbeing are explored and expressed in ways that are both beneficial and sustainable.

Key Words: Nature; Natural Environments; Health and Wellbeing; Biophilia

The notion that humans are dependent on nature, not only for material needs (food, water, shelter, and so on) but perhaps more importantly for psychological, emotional and spiritual needs, has gained growing support recently (Friedmann & Thomas 1995; Frumkin 2001; Katcher & Beck 1987; Rossak, Gomes & Kanner 1995; Wilson 1984, 2001). But the basis and extent of that dependency and the exact character of the benefits to be gained from interacting with nature are issues that require much more investigation.

Research and publications in such diverse disciplines as psychology, environmental health, psychiatry, biology, ecology, landuse planning, horticulture, leisure and recreation, wilderness, public health policy and medicine support the idea that contact with nature is good for human health and wellbeing. For example, the ‘biophilia’ hypothesis developed by the biologist Wilson (1984, 1993) and debated and expanded by others (e.g. Kahn 1999; Kellert 1997; Kellert & Wilson 1993; Takacs 1996) suggests that the evolution of humans in the company of other living organisms predisposes human beings to rely intellectually, emotionally, physically and spiritually on affiliations with nature. This view is supported by ecopsychologists, who assert that many psychological and physical afflictions are due to withdrawal from contact with nature, and that exposure to nature can have positive benefits (Burns 1998; Cohen 2000; Durning 1995; Hillman
A broad range of health benefits appears to flow from contact with nature. For example, international research indicates that simply viewing a natural scene or watching wildlife has been shown to reduce stress and tension, improve concentration, remedy mental fatigue, boost immunity, speed recovery, and enhance psychological health. That is aside from any physical health benefits (for example, in terms of cardiovascular health) that may flow from reduced stress, increased exercise and improved air quality experienced by those whose contact with nature involves activities in natural environments. The literature suggests that interacting with nature through gardening or having a companion animal is also beneficial for health, and where these activities involve contact with other humans, might extend benefits beyond the individual to the community, through enhanced social capital.

Separation from nature (a relatively recent trend in human history) related to the shift of people away from rural areas into cities (Axelrod & Suedfeld 1995; Beck & Katcher 1996; Katcher & Beck 1987) is seen, therefore, as undermining human health and wellbeing. Moreover, the insulation of people from outdoor environmental stimuli (Stilgoe 2001) and their exposure to excessive artificial stimulation - both features which characterise modern societies - are believed to cause exhaustion and produce a loss of vitality and health (Katcher & Beck 1987; Stilgoe 2001). Frumkin (2001) suggests that satisfying human beings' innate affinity with the natural world might be the key to enhancing human health. Table 1 provides an overview of the evidence supporting this view.

Yet, there remains a lack of understanding and acceptance among the majority within the general populace, governments, institutions and health care providers about the significance of human connectedness with nature, and its relevance to current problems of health and wellbeing. A number of possible explanations exist for this lack of broad support for the "nature-health" connection. They can be classified under four broad foci: philosophical issues; theoretical issues; methodological issues; and empirical issues.

At the most basic philosophical level, the issue of what constitutes "nature" remains a matter of debate. Harper (1996) points out that, although pre-industrial societies were dependent on "nature" (i.e. the environment in which they existed), the concept of "nature" as a way of thinking about the environment emerged largely in the 18th century, through the works of the romantic artists, poets and writers of the time. According to Harper (1996 p. 35), "nature" (which was conceptualised as "good" – the "pristine natural state") was contrasted with the world of science and industry, which was characterised as evil, artificial and corrupt. This conceptualisation of "nature" emerged largely in response to the dominant paradigm of industrial societies, which featured a low valuation of nature for its own sake and a belief that nature/the environment was primarily a resource for exploitation by humans for their own ends (Birch 1993; Harper 1996; Townsend 1998).

Such has been the dominance of that paradigm, that one might be tempted at times to question whether or not, in the increasingly synthetic and "mass-mediated" environment of most modern Western societies, there is much about nature that is (in fact) natural. In a society where "good nature" is perceived to have passed out of existence, and/or where "nature" is seen as merely an economic resource, it is not hard to see why the relevance of nature to human health and wellbeing is overlooked. Moreover, while the link between place (including natural elements of place) and health has always been a key focus within the practice of environmental health, the emphasis has been on protecting the public
Table 1: Evidence for the health-enhancing role of contact with nature

<table>
<thead>
<tr>
<th>Assertion</th>
<th>Evidence</th>
<th>Key Reference/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beneficial physiological effects occur when humans encounter, observe or otherwise positively interact with animals, plants, landscapes or wilderness</td>
<td>✓✓✓</td>
<td>Friedmann, Katcher et al. 1983; Friedmann, Katcher et al. 1983; Parsuns 1991; Ulrich, Simmons et al. 1991; Rohde and Kendle 1996; Beck and Katcher 1996; Franklin 2001</td>
</tr>
<tr>
<td>Natural environments, such as parks, foster recovery from mental fatigue and are restorative</td>
<td>✓✓✓</td>
<td>Kaplan, 1995; Hartig et al. 1991; Kaplan &amp; Kaplan, 1990; Kaplan &amp; Kaplan, 1989; Furrer, 1979</td>
</tr>
<tr>
<td>There are established methods of nature-based therapy (including wilderness, horticultural, and animal-assisted therapy among others) that have success healing patients who previously had not responded to treatment</td>
<td>✓✓✓</td>
<td>Fawcett &amp; Gallone, 2001; Crisp &amp; O'Donnell, 1998; Lewis, 1996; Russell et al 1996; Beck et al, 1996; Katcher &amp; Beck, 1984; Levinson, 1969</td>
</tr>
<tr>
<td>People prefer natural environments to urban ones, regardless of nationality or culture</td>
<td>✓✓</td>
<td>Herzog et al. 2000; Newell, 1997; Parsuns, 1991</td>
</tr>
<tr>
<td>The majority of places that people consider favourite or restorative are natural places, and being in these places is recuperative</td>
<td>✓✓✓</td>
<td>Herzog et al. 2000; Herzog et al. 1997; Newell, 1997; Korpela &amp; Hartig, 1996; Rohde &amp; Kendle, 1994; Kaplan &amp; Kaplan, 1989</td>
</tr>
<tr>
<td>People have a more positive outlook on life and higher life satisfaction when in proximity to nature (particularly in urban areas)</td>
<td>✓✓✓</td>
<td>Ron, 2001; Ken &amp; Sellman, 2001; Kaplan, 1990; Leather et al., 1998; Lewis, 1996; Kaplan &amp; Kaplan, 1989</td>
</tr>
<tr>
<td>The majority of health problems society will face, now and in the future, are likely to be stress-related illnesses, mental health problems, and cardiovascular health problems</td>
<td>✓✓✓</td>
<td>Commonwealth Dept of Health &amp; Aged Care &amp; Australian Institute of Health &amp; Welfare, 1999; Australian Institute of Health &amp; Welfare, 1998</td>
</tr>
<tr>
<td>Social capital is decreasing and is likely to continue to decline</td>
<td>✓✓✓</td>
<td>Putnam, 1995</td>
</tr>
<tr>
<td>Exposure to natural environments, such as parks, enhances the ability to cope with and recover from stress, cope with subsequent stress, and recover from illness and injury</td>
<td>✓✓✓</td>
<td>Parsuns 1991; Ulrich et al 1991; Ulrich et al., 1984</td>
</tr>
<tr>
<td>Observing nature can restore concentration and improve productivity</td>
<td>✓✓✓</td>
<td>Taylor et al. 2001; Leather et al. 1998; Teinensson &amp; Cimpanich, 1995</td>
</tr>
<tr>
<td>Raising nature in close proximity or just knowing it exists, is important to people regardless of whether they are regular &quot;users&quot; of it</td>
<td>✓✓✓</td>
<td>Cordell et al. 1998; Kaplan &amp; Kaplan, 1989</td>
</tr>
</tbody>
</table>

(Adapted from Moller, Townsend, Brown & St Leger, 2002 – see original document for detailed reference list relevant to this Table)

from environmentally-induced harm rather than facilitating beneficial contact with nature. However, recent trends in the practice of environmental health reported in previous issues of this journal (e.g. the emerging emphasis on sustainability highlighted by Harris & Chu 2001; the development of Municipal Public Health Planning discussed by Hay, Frew & Butterworth, 2001; and the increasing role of environmental health officers in integrating community-based environmental health activities, noted by Nicholson 2001) suggest a shift in emphasis within environmental health which may help to overcome this philosophical disjunction.

The diversity of disciplines encompassed by the issue of the human health impacts of contact with nature also poses problems for the development and application of cogent theories and explanations. This issue of disciplinary bias lies at the heart of the debate about the relationship between “nature” and “culture” (the so-called “nature/culture dualism”), and while some attempts have been made to overcome the dichotomies and dualisms evident within the debate (e.g. Dickens 1992; Wolfe 1990), the lack of integration undermines the capacity to use theories to encourage adoption of nature-based approaches to human health.
Methodologically, too, problems confront those who wish to research the human health impacts of contact with nature. In part these methodological difficulties arise from the conceptualisation of "health" in different ways. For example, research into "health" defined in physical health terms (such as blood pressure, heart rate, or lung capacity), requires a different approach from research into "health" defined in the terms of the World Health Organization (1948) as "a complete state of physical, mental and social wellbeing, and not merely the absence of disease or infirmity". This differentiation is further compounded by the fact that, in many situations, it may be difficult (if not impossible) to implement properly "controlled" studies, since controlling for contact with "nature" might be difficult, if not impossible. At the very least, it is fair to say that research into the human health benefits of contact with nature will require triangulation - defined as the "use of multiple and different sources, methods, investigators, and theories to provide corroborating evidence" (Creswell 1998, p. 202) as a means of verification of outcomes.

Empirical evidence for the human health benefits of contact with nature is limited, as Tables 1 and 2 demonstrate. Much of the research that has been undertaken is US-based, with very little Australian research in this area. However, the existing literature indicates the potential for promoting health and wellbeing in a cost effective, accessible and equitable way through contact with nature. This paper outlines a program of research being developed in Australia to address this shortfall.

**Healthy Parks, Healthy People**

Parks Victoria (the body responsible for management of parks in the State of Victoria) uses the slogan "Healthy Parks, Healthy People" to promote its activities. Interested to explore the extent to which the slogan's claims could be verified, in June 2001 Parks Victoria provided funding to Deakin University to undertake an independent review of literature on the links between human health and contact with nature in a park context.

In the process, it became apparent that little or no empirical research into the human health benefits of contact with nature has been undertaken in Australia, and that research elsewhere has been limited. Table 2 based on the findings of the initial research, indicates some of the major gaps in existing research (Maller et al. 2002) and some of the areas where research/data is needed.

In response to this void, the Deakin University research team has established collaborative relationships with a range of researchers, practitioners, institutions and policy makers to develop projects that will provide empirical data necessary to evaluate the claims made or implied for health benefits flowing from human-nature interaction.

The remaining sections of this paper outline the program of research being established by the Deakin-based team to address the need for empirical data. Details are provided of the rationale, scope, methodology and progress on a range of projects, either currently being undertaken or for which funding has been sought. Additional potential foci for research and partnerships/collaborations are also outlined.

**Current or proposed projects**

**Living high but healthy**

Despite evidence that urban environments are detrimental to human health (Parsons 1991; Rohde & Kendle 1994), and that isolation from nature produces a loss of vitality and health (Gullone 2000; Katcher & Beck 1987; Stilgoe 2001), inner city highrise apartment living in Australia's major cities is increasing rapidly. The impacts of this trend on individual and population health, wellbeing and daily life functioning are unknown. While some
Table 2: Gaps in the research/evidence for the health-enhancing role of contact with nature

<table>
<thead>
<tr>
<th>Assertion</th>
<th>Evidence</th>
<th>Key Reference/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>People have an innate affiliation with nature that enhances health, and humans rely on nature intellectually, emotionally, physically and spiritually</td>
<td>✔ ✔</td>
<td>(Fawcett &amp; Guille, 2001; Frankin, 2001; Rozak et al, 1995; Kellert &amp;Wilson, 1993; Katcher &amp; Beck, 1997; Wilson, 1984)</td>
</tr>
<tr>
<td>There may be a genetic basis to human affiliation with, and attraction for, nature</td>
<td>✔ ✔</td>
<td>(Kellert, 1997; Newell, 1997; Kellert &amp; Wilson, 1993)</td>
</tr>
<tr>
<td>Separation from nature via modern living is detrimental to human development, health, and well-being</td>
<td>✔ ✔</td>
<td>(Frankin, 2001; Scott, 2001; Stiglitz, 2001; Kellert, 1997; Katcher &amp; Beck, 1987)</td>
</tr>
<tr>
<td>Regular contact with nature, such as provided by parks, is required for mental health</td>
<td>✔</td>
<td>(Rozak, 1995; Levinson, 1983; Levinson, 1969)</td>
</tr>
<tr>
<td>There are psychological and physiological benefits to health from the act of nurturing living things (including plants, animals, and humans)</td>
<td>✔ ✔</td>
<td>(Kellert, 1997; Bostad, 1996; Wilson, 1993; Lewis, 1990a; Katcher &amp; Beck, 1987)</td>
</tr>
<tr>
<td>Nurturing is an essential part of human development, and lack of opportunities to nurture may be detrimental to health and well-being</td>
<td>✔ ✔</td>
<td>(Kellert, 1997; Bostad, 1996; Wilson, 1993; Lewis, 1990a; Katcher &amp; Beck, 1987)</td>
</tr>
<tr>
<td>Too much artificial stimulation and lack of exposure to natural environments, such as parks, can cause exhaustion and reduce vitality</td>
<td>✔</td>
<td>(Stiglitz, 2001; Parsons, 1991; Katcher &amp; Beck, 1988; Furniss, 1979; Stainbrook, 1973, in Lewis, 1996)</td>
</tr>
<tr>
<td>What the Research Suggests but for which Limited Evidence exists</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assertion</th>
<th>Evidence</th>
<th>Key Reference/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human health is affected by lack of opportunities to experience nature</td>
<td>✔</td>
<td>(Frankin, 2001; Stiglitz, 2001; Kellert, 1997; Katcher &amp; Beck, 1987)</td>
</tr>
<tr>
<td>The destruction of the natural environment directly affects human health and well-being and is linked to the prevalence of mental disorders in modern society</td>
<td>✔</td>
<td>(Rozak et al, 1995)</td>
</tr>
<tr>
<td>Parks are important to the community in terms of health and people derive actual health benefits from parks</td>
<td>✔</td>
<td>(Kiechel, 1989)</td>
</tr>
<tr>
<td>Natural environments (natural capital) play a key role in facilitating social and human capital, and this has outcomes in terms of health</td>
<td>✔</td>
<td>(Frankin, 2001; Putnam, 1995)</td>
</tr>
<tr>
<td>Contact with nature plays an important role in wilderness and adventure therapy</td>
<td>✔ ✔</td>
<td>(Crisp, 1998; Crisp &amp; O'Donnell, 1998)</td>
</tr>
<tr>
<td>Health and life satisfaction of some population groups (e.g. friends of Parks groups, park volunteers, wildlife lovers and carers, or birdwatchers) is greater than others, where these groups have regular contact with nature/wilderness via parks</td>
<td>✔</td>
<td>No information discovered at this time</td>
</tr>
<tr>
<td>Nature and parks play an important role in maintaining psychological health (but the extent, nature and process of this influence is unclear)</td>
<td>✔</td>
<td>No information discovered at this time</td>
</tr>
<tr>
<td>Nature and parks play an important role in fostering a sense of quality of life and happiness (but the extent, nature and process of this influence is unclear)</td>
<td>✔</td>
<td>No information discovered at this time</td>
</tr>
<tr>
<td>Exercise carried out in natural settings may have greater health benefits than indoor exercise</td>
<td>✔ ✔</td>
<td>No information discovered at this time</td>
</tr>
</tbody>
</table>

(Adapted from Mallet, Townsend, Brown & St Leger, 2002 – see original document for detailed reference list relevant to this Table)
highrise urban settings predicted more effective management of the demands of everyday life. This project will provide comparable data for Australia.

The "Living high but healthy" project will identify, describe and measure associations between differing levels of access to natural environments, and the health, wellbeing and effective functioning of residents in inner urban highrise developments. The project will be based on the administration of a questionnaire including psychometrically validated self-report measures, with a sample of 600 residents in a selection of high-rise housing developments in inner Melbourne and inner Sydney. Qualitative data will be collected through face-to-face semi-structured interviews with a sub-sample of 300 residents. The interview schedule will explore meanings, understandings and experiences of participants about their health, wellbeing and effective functioning.

**NATYR - Nature-based Therapy for Youth at Risk**

Anecdotal evidence indicates that sustained contact with nature could be used as a strategy to address social and mental health problems, including addiction and antisocial behaviour (e.g. Bennett, Cardone & Jarzycy 1997; Beringer 1999; Cohen 2000; Crisp & O'Donnell 1998; Lewis 1996; Scull 2001; Taylor, Kuo & Sullivan 2001). Recent publicity surrounding the issue of "chroming" (the inhalation of toxic but licit substances) by young people in the care of welfare and support agencies in Victoria prompted an investigation into the possibility of undertaking a nature-based intervention study, working with young people who either are involved in chroming or are at risk of involvement in chroming.

Preliminary research drew together information on more than 70 different intervention programs thought to have potential for adaptation to meet the needs of the target group. This research reinforced the belief that there has been a lack of empirical research in this area, and that many of the programs adopted, especially in Australia, have not been well documented or evaluated. Moreover, while most programs reviewed reported a high degree of success, the long-term sustainability of the benefits to health and wellbeing is largely unknown. It became apparent, therefore, that both empirical research and longitudinal program evaluation are needed if the claims about the benefits of nature-based interventions for "at risk" youth are to be verified. In response to this need the NATYR project has been developed.

This collaborative project, based at Deakin University, will involve the development, implementation and evaluation of a nature-based intervention program with vulnerable young people with multiple risk factors for licit substance abuse. The intervention will involve several components, including a nature-based expedition in a Parks Victoria location in rural Victoria, and participation in a 5-month long activity program involving contact with nature (including companion animal and horticultural elements). Approximately 90-100 young people identified by a major child, youth and family welfare agency as being at high risk of licit substance abuse will be recruited over a period of three years to participate in the intervention program. A repeated measures pre-post follow-up design, using a wait-list control group, will be used to evaluate the intervention outcomes. Repeated assessments will include standardised measures of psychological and behavioural functioning, and risk and resilience factors.

**Influence of "hands-on" nature-based activities on the mental health of children**

Empirical studies indicate that nature can have significant and lasting psychological and physiological effects on health and wellbeing in children (Fawcett & Gullone 2001; Taylor et al. 1998; Wells 2000). Other work using companion animals and/or wilderness experiences to treat children and
adolescents suffering from behavioural and/or psychological disorders has also indicated positive outcomes (Beck & Katcher 1996; Crisp & Auinger 1998; Fawcett & Gallone 2001; Levinson 1969; Ross 1999). Yet the mental health benefits of contact with nature for “normal” children have not been investigated as a potential tool for health promotion. Recently, Kellert (2002) asserted that direct experience of nature plays a significant, vital, and perhaps irreplaceable role in affective, cognitive, and evaluative development, but further study is needed to verify this.

This study will investigate the effect of contact with nature on children’s mental health and wellbeing as a result of participating in “hands-on” nature-based activities encountered at school. The potential mental health benefits arising from contact with nature gain greater significance in the context of the rise in mental illnesses, both in Australia and worldwide, and the high social and financial costs these disorders entail (Herman 2001).

The study will involve a survey of Victorian primary schools to identify the type and extent of any “hands-on” nature-based activities experienced by school pupils over the last 3-5 years. From the initial survey, a sub-sample of schools that have included a substantial “hands-on” nature-based program within the life of the school will be selected. A detailed questionnaire will be distributed to key contact staff within this sub-sample to determine the perceived outcomes and benefits of the activities, including the mental health benefits for the student participants.

A sample of schools from the initial survey that have not introduced any “hands-on” nature-based activities will be selected and invited to participate in the study by agreeing to introduce a “hands-on” nature-based activity at the school. Parents/guardians of children participating in the program will be asked to rate children’s performance on a range of indicators of mental health. After the program has been running for six months, focus groups will be conducted with a selection of staff and a selection of parents whose children participated in the programs. The purpose of the focus groups will be to explore the perceptions of parents and teachers about the outcomes of the programs, particularly in terms of mental health benefits for the participants.

Exploring the health and wellbeing benefits of friends group membership

The role of social capital (defined in terms of networks, trust and norms which facilitate co-operation and cohesion in communities) as a key determinant of health has been highlighted by recent research (Kawachi & Kennedy 1997; Leeder & Dominello 1999; Runyan et al. 1998). Despite this recognition of the importance of social capital for health, Putnam (1995) observes that social connectedness and civic engagement – key aspects of social capital – are in decline. Other research has demonstrated the importance of contact with natural environments for human health and wellbeing (Frumkin 2001; Wilson 2001). These two strands of research into health determinants appear to merge in anecdotal evidence that suggests engagement in civic environmentalism (through groups such as “Friends of Parks”) has spin-off health benefits, relating to a combination of exposure to natural environments and increased social capital (Maller et al. 2002). This link is supported by Furnass (1996) who defines the components of wellbeing as including satisfactory human relationships, meaningful occupation, opportunities for contact with nature, creative expression, and making a positive contribution to human society.

This pilot project, undertaken in collaboration with Parks Victoria and the Damper Creek Friends Group, has as its aims:
• to identify the range of motivations of Damper Creek Friends Group members for joining the group;

• to document members’ perceptions of the benefits they gain either directly or indirectly from membership of the group (including health and wellbeing benefits);

• to explore members’ perceptions of the factors contributing to the benefits they gain through group membership;

• to assess the potential for Friends groups to be used as an “upstream” measure to generate improvements in public health and wellbeing.

The program involves several components. The first element (recently completed) involved face-to-face interviews with members of the Damper Creek Friends Group. The second stage of the program will involve the conduct of a focus group with a sample of members of the Damper Creek Friends Group, representatives of Parks Victoria, representatives of VicHealth, and representatives of several Divisions of General Practice, to explore barriers to and potential for the intentional use of Friends groups as a way of promoting health and wellbeing.

Exploring the potential for nature-based therapies within the Children’s Protection Society

Recent discussions with staff of the Children’s Protection Society (CPS) have identified the need for a feasibility study to be undertaken to identify the potential benefits of and barriers to the adoption of nature-based therapy programs (such as animal-assisted therapy and/or horticultural therapy) within CPS. This project involves the use of qualitative interviews with staff and management of the Children’s Protection Society, West Heidelberg, to assess perceptions of the potential benefits arising from nature-based interventions, and to explore issues such as: liabilities; occupational health and safety; hygiene; staff preparedness; client consent; the nature of potential interventions; and a Framework for Evaluation.

The aims of the project are as follows:

• to assess respondents’ perceptions of the potential benefits arising from nature-based interventions;

• to identify any problems perceived by staff in relation to animal assisted therapy and/or horticultural therapy;

• to explore issues relating to the implementation of nature-based interventions by CPS (as listed above);

• to gauge the potential for formal adoption of nature-based therapies within CPS.

Face-to-face interviews will be conducted with CPS staff and management. During these interviews, the researchers will explore the issues outlined above.

Linking PAWS (Linking People & Animals for Wellbeing in Strathdon)

Strathdon Community is a Uniting Church aged care facility in Forest Hill, Victoria which is home to approximately 250 residents. Staff of Strathdon have expressed interest in nature-based therapies as a mechanism for improving the wellbeing of Strathdon residents, especially those who because of frailty are unable to “get out and about”. Currently, there is a limited gardening program in which residents can participate, and the Community has a resident cat. However, the Activities Officer has noted that the cat spends most of its time in the administration area, and residents of the nursing home section of Strathdon do not really have any significant contact with the cat.
Given the ageing of Australia’s population, and the burgeoning health costs associated with that, the issue of strategies to optimise health and wellbeing among older people is a matter of increasing significance. This study will involve an analysis of the health and wellbeing of a sample of Strathdon residents before and after an intervention involving the introduction of a visiting companion animal program (organised through the Lort Smith Animal Hospital), and will have as its aims:

- to develop a theoretical understanding of the benefits of contact with nature for human health and wellbeing, with a particular emphasis on benefits for older people in residential accommodation;

- to assess the health and wellbeing of a sample of residents within the Strathdon Community, both before and after the introduction of a visiting companion program;

- to evaluate the visiting companion animal program and identify the factors that might facilitate and/or inhibit its continuation and/or expansion within Strathdon and other similar agencies/facilities.

This study will be undertaken by Deakin University, in partnership with the Strathdon Community. A mixture of quantitative and qualitative methods will be used, including questionnaires and face-to-face interviews with a sample of staff and residents.

**Discussion**

The findings of the preliminary studies undertaken by the Deakin University team indicate that the potential scope of research into the benefits of contact with nature for human health and wellbeing is virtually limitless. As Table 1 shows, existing data indicate that contact with nature is important for human health and wellbeing. However, Table 2 highlights the fact that empirical data need to be collected to verify this link and to explore its implications in terms of a range of health foci and a variety of target groups.

The projects outlined above form part of a program of research developed by the Deakin University-based collaboration, to be implemented over the next five years, as funding becomes available. The health-related foci of these and other future studies will include: mental health (including stress and depression); social wellbeing; cardiovascular disease; ageing; abusive behaviour; recidivism. A wide range of target groups will be included in the studies, including groups of varying age, socioeconomic status, geographic location, and life situation.

In light of the ageing populations in the developed world, the burgeoning rates of mental illness, and the increasing pressures these will place upon government health care budgets, efficient and cost effective options for prevention of potential health problems and for the solution of existing health problems must be explored as a matter of urgency. Moreover, growing threats to the environment associated with climate change, resource depletion and environmental degradation are increasingly being recognised as threats also to human health, implying that “ecosystem health issues” relate not only to access to nature but also to quality of nature. This highlights the fact that management of changing environmental conditions and management of health go together. The Deakin-based collaboration is attempting to address these issues by linking academics, practitioners (particularly in the area of community-based services for children and older people), and urban planning/open space managers/policymakers. However, if the potential benefits of contact with nature for human health and wellbeing are to be maximised, then many other stakeholders need to be brought in to the decision making. These include: policy-
makers within federal, state and local governments (across a range of policy areas, including health, environment, education, welfare, employment, and industrial relations); mainstream health care providers; architects, designers, planners and developers; community representatives; media; and educators. This paper highlights an agenda for future research, and in doing so, places a challenge before health researchers, research funding bodies, and the broad range of stakeholders outlined above, to ensure that human connectedness with nature is not ignored as a potential determinant of health and wellbeing.

Acknowledgments

The authors would like to thank Parks Victoria and its Strategic Partners, and Associate Professor Eleonora Gullone, Mr John Senior, Ms Sheree Limbrick and Mr Simon Crisp for their contributions to the development of this ongoing program of work.

Endnote

1. An earlier version of this paper was presented at the Indopacific Ecosystem Health Conference in Perth, Western Australia in November 2002.

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