

Health and the natural heritage – the evidence base

The purpose of this paper is to present the evidence of links between public health and the natural heritage. SNH will use the contents of the paper to produce promotional materials to raise awareness of the important contribution the natural heritage can make to improvements in people's health and well-being.

Scotland has a number of long-standing and significant health issues. Those with particular relevance to and links with the natural heritage are: cardiovascular disease, obesity and depression. We have become a sedentary society, largely living in an environment which does not encourage physical activity as a part of everyday life. 52% of men / 65% of women in Scotland are sedentary – ie fail to achieve the national target of 30 minutes moderate activity on most days of the week. 26% of boys / 37% of girls (aged 2 – 15 years old) fail to achieve the recommended 60 or more minutes of physical activity on 7 days a week (2005 data ¹). 22% of men / 24% of women are obese (BMI > 30); 64% of men / 57% of women are overweight ie BMI > 25 (including obese) – 2003 data ². The main determinants are physical inactivity and poor diet. Estimated daily use of antidepressant drugs by the adult population (aged 15 to 90) increased from 1.9% in 1992/93 to 8.7% in 2005/06. For 2005/06, 77% of the average annual distance travelled was by car; 2.6% by foot; 0.3% by bicycle (National Travel Survey). Access to the outdoors is increasing, but more visits now involve a shorter distance travelled to destination and more visits are now of a shorter duration. Poor health is the second most frequently cited reason for not visiting the outdoors, and has increased from 22% of respondents in 2004 to 28% in 2007 (Scottish Recreation Survey ³).

From this poor base, and the regional inequalities that lie beneath the national data, there is a growing body of evidence linking public health, in terms of physical and mental (through spiritual enrichment, cognitive development and aesthetic experiences) benefits, to the natural environment.

Contact with the outdoors and nature can contribute to a healthier Scotland in five main ways – these are presented below.

Physical activity through 'Green exercise'

Being active outdoors, through informal recreation and leisure, volunteering, and learning in the outdoors, can play an important role in improving people's physical and mental health.

- An Australian review of empirical, theoretical and anecdotal evidence concluded that contact with nature specifically impacts positively on blood pressure, cholesterol, outlook on life and stress reduction. Maller C, Townsend M, Ptyor A, Brown P, St Leger L. 2005.
- In 2005, 54% of adult cyclists stated 'leisure' as the main reason to cycle; 27% stated they cycled for exercise / to keep fit. Cycling in Scotland 2005. Scottish Executive Social Research.
- 38% of respondents cycled off-road in 2005, significantly more than in 2001 and 1997 (26%). Cycling in Scotland 2005. Scottish Executive Social Research.
- Advice to take part in health walks was more likely to lead to longer term participation than general advice to exercise. Lamb S E, Bartlett H P, Ashley A, Bird W. 2002.

¹ Scottish Executive – Health Education Population Survey 2005

² Scottish Executive – Scottish Health Survey 2003

³ Scottish Natural Heritage Commissioned Report No. 321 – Scottish Recreation Survey: annual summary report 2007 published 2009

- People with good access to large, attractive public open space were 50% more likely to achieve high levels of walking. Giles-Corti B, Broomhall M H, Knuiiman M, Collins C, Douglas K, Ng K, Lange A, Donovan R J. 2005
- A 6 month study of Green Gym participants in SW England showed improvements in mental health component on SF12 health questionnaire and improvements in fitness measures. Reynolds V. 2002.
- In 2007, 28% of people considered themselves to be in too poor health for visiting the outdoors, an increase from 22% in 2004. 2007 Scottish Recreation Survey. 2009.
- Some places and activities have a role in providing 'salutogenic environments' that can encourage people to be healthy as opposed to 'obesogenic environments' which do not, thereby potentially encouraging obesity. Catharine Ward Thompson et al, OPENspace Research Centre; Takemi Sugiyama, The University of Queensland, 2007.

Natural contribution to effective recovery

The natural heritage can have important 'restorative qualities' and thus promote recovery from physical and mental stresses. Experience of the natural heritage, and involvement in its care, can improve the mental health and well-being of individuals by helping recharge their physical, mental and social capacities.

- Patients recovering from gall-bladder surgery in a hospital setting with a green view used fewer analgesics, recovered quicker and had fewer negative comments in the nurses' notes compared to those with a view of a brick wall. Ulrich R S. 1984.
- People prefer areas with trees and grass, and negatively respond to areas devoid of vegetation. The mere presence of trees encourages more frequent use of the outdoor space and experiencing nature reduces mental fatigue, diminishes sensations of stress and has emphatic effects on mood. Kuo F E, Sullivan W C, Coley R L and Brunson L. 1998.
- The probability of survival for elderly people over a five-year period increased with the amount of accessible green space close to people's place of residence and the perceived ability to take a stroll in tree lined streets and parks. Takano T, Nakamura K, and Watanabe M. 2002.
- Studies of 'nature deficit disorder' or 'nature deprivation' suggest that experience of nature, even a view of greenery "borrowed" through car or hospital windows, can have a therapeutic effect on the social, emotional and mental functioning of individuals. Brice R and Vickers A. 2007.
- Results of a survey of over 800 horticulture and gardening projects throughout the UK, and in-depth case studies and interviews with vulnerable adults who use horticulture and gardening as a form of therapy, highlight the benefits of social and therapeutic horticulture. Various case-reports describe improvements in mental health status or mood. Overall, 55% of interviewees stated large improvements in physical health and 26% felt fitter as a result of participation. Sempik et al. 2005.
- A review of over 100 studies found convincing evidence of the importance of the natural environment in facilitating recovery from stress, and that the benefits of viewing green-space or other nature goes beyond aesthetic enjoyment to include enhanced emotional well-being, reduced stress, and, in certain situations, improved health. Mace B L, Bell P A, and Loomis R J. 1999.

The outdoors as preventative medicine

Contact with the natural heritage can help protect us from future stresses and aid mental concentration. Just being outdoors can bring about multiple health and well-being benefits, and can help people guard against future illness. Vitamin D deficiencies are most likely at high latitudes, and in dark-skinned people, meaning that the health inequalities already experienced in Scotland by dark-skinned ethnic minorities due to socio-economic factors (which impact on the local environment in which these groups often live) and older people, may be accentuated by their tendency to take less outdoor exercise than other groups.

- Exposure to sunlight and the consequent production of vitamin D has long been recognised as important in maintaining bone density, so reducing the risk of rickets in young children and osteoporosis in older people. There is growing evidence that ensuring adequate levels of vitamin D also reduces the prevalence of some cancers, particularly in the colon, diabetes and heart disease – illnesses that account for 60–70% of deaths in high-income nations. It has also been linked to multiple sclerosis, influenza and schizophrenia.
- See ‘Commentary: progress of a paradigm’. CF and FC Garland, *International Journal of Epidemiology*, 2006 35(2):

1994 study related sunlight exposure to reduced rates of mortality from ovarian cancer in US women. Lefkowitz ES, Garland CF – Sunlight, vitamin D, and ovarian cancer mortality rates in US women. *International Journal of Epidemiology* 1994; 23:1133-36.

2007 study in USA found that overall risk of cancer in women was cut by 60% when they were given 1,100 IU of vitamin D, plus a calcium supplement.

2001 Finnish study found that children given 2,000 IU of .vitamin D daily cut their risk of getting juvenile diabetes by 80%

- Living near green space created less health complaints and both better mental and physical health than an urban environment. For every 10% increase in green space there was a reduction in health complaints equivalent to a reduction of 5 years of age. de Vries S, Verheij R A and Groenewegen P P. 2001.
- Where walking can be done, it distracts from self-contemplation and thereby mitigates depression. There are cumulative benefits of restorative landscapes and these benefits depend on: places being accessible, time (2 hours a week) being available, repeated events or visits, regular visits, and visits over an extended period of time. Terry Hartig, in *Open Space : People Space*. 2007.

Wider social health and well-being benefits

Contact with nature and the outdoors is associated with wider social health and well-being benefits, and experience of the natural heritage and involvement in its care can lead to stronger more inclusive and sustainable communities.

- Research has shown links between the availability of communal greenspaces in urban areas and higher levels of community cohesion and social interaction between neighbours. Kuo et al. 1998. Kuo & Sullivan. 2001.
- Environments that promote good health may be crucial to reducing health inequalities. A study comparing income-related health inequality of people living in areas of England with high and low amounts of greenspace shows that people exposed to the greenest

environments are less likely to die (from all causes or circulatory diseases) even when taking into account income. Mitchell R, Popham F, 2008.

- People who live in neighbourhoods with 'traditional' or 'walkable' designs report about 30 minutes more walking for travel each week, and more total physical activity including among older residents, compared to those who live in less walkable environments. Cervero & Radisch, 1996; Khattak & Rodriguez, 2005.
- Social or community quality of life is demonstrated by “self-efficacy, perceived control, autonomy and independence, and stress, in addition to more predictable dimensions of pleasure and satisfaction”. Terry Hartig, in *Open Space : People Space*. 2007.
- Greenspaces are one of the few remaining spaces that are available to all. Surveys show that greenspaces are important as places of memory, and are closely associated with neighbourhood identity. Greenspace Scotland. 2007

Young people and sustained benefits

There is potential to encourage healthier lifestyles by stimulating positive interest in the natural world and encouraging outdoor activity at a young age. Over recent decades, there has been a notable decrease in children’s physical activity, with outdoor play replaced to a significant extent by television and computer, and an increase in the number of young people being driven to school and other places. This, accompanied by other social, economic and environmental factors, has contributed to the growing problem of childhood obesity and other health and well-being issues related to a less active younger generation.

- 26% of boys / 37% of girls (aged 2 – 15 years old) fail to achieve the recommended 60 or more minutes of physical activity on 7 days a week. Scottish Executive – Health Education Population Survey 2005
- Green play settings improved children's concentration: children with Attention Deficit Disorder were found to function better than usual after activities in green settings. Taylor A F, Kuo F E and Sullivan W C, 2001.
- Children’s contact with nature, through tending gardens, playing in parks and being in spaces with trees are significant predictors of positive adult beliefs about the benefits of nature. Lester and Maudsley, 2006.
- A study looking at the association between park proximity, park type, and park features and physical activity in adolescent girls used USA-wide data. The study concluded that adolescent girls who live near more parks, particularly near those with amenities that are conducive to walking and with active features, engage in more non-school moderate / vigorous physical activity than those with fewer parks. Cohen et al. 2006.
- In a study of children’s well-being in 25 European countries, the UK was ranked 21st, scoring badly for relationships with parents and peers, health, relative poverty; up to one in 12 British children deliberately hurt themselves on a regular basis, the highest rate in Europe; 20% of children and young people in the UK have mental health problems at some point, and one in 10 has a clinically recognisable mental health disorder. Data from Child and Adolescent Mental Health Services, Mental Health Foundation, Summerfield and Gill, Unicef – quoted in the report of *The Good Childhood Inquiry*, The Children’s Society. 2009.
- The frequency of childhood visits to natural environments is the single most important predictor of how often people visit such places as adults. Those who visited woodlands often as children are more likely to go walking alone there as adults. Ward Thompson, C, Aspinnall, P and Montarzano A,. (2008).

Key information sources relevant to Health and the Environment:

Government publications

Let's Make Scotland More Active: a strategy for physical activity. Scottish Executive, 2003.
Five year review – NHS Health Scotland, February 2009

Good Places, Better Health: a new approach to environment and health in Scotland – Implementation Plan 2008. First phase of implementation is 2009 – 2011 – focusing on how to achieve health-nurturing environments that will influence children's health and sustainable places. Four children's health issues: obesity, unintentional injury, asthma, mental health & well-being, with commitment to monitor and evaluate how the policy changes announced in the plan bring about results in the delivery of national outcomes.

<http://www.scotland.gov.uk/Publications/2008/12/11090318/0>

Equally Well: Report of the Ministerial Task Force on Health Inequalities. Scottish Government, June 2008

<http://www.scotland.gov.uk/Publications/2008/06/25104032/0>

Equally Well Implementation Plan. Scottish Government, December 2008

<http://www.scotland.gov.uk/Publications/2008/12/10094101/0>

Healthy Eating, Active Living: an action plan to improve diet, increase physical activity and tackle obesity (2008-2011) Scottish Government, 2008.

<http://www.scotland.gov.uk/Publications/2008/06/20155902/0>

Towards a Mentally Flourishing Scotland – policy and action plan. Scottish Government, May 2009

<http://www.scotland.gov.uk/Publications/2009/05/06154655/0>

Future research to monitor delivery – 'Environmental determinants of public health in Scotland' - four year programme, as part of the Environment and Human Health Initiative, led by the Institute of Occupational Medicine, Edinburgh, plus other research bodies.

Other

A countryside for health and well-being: the physical and mental health benefits of green exercise. Countryside Recreation Network. 2005

<http://www.countrysiderecreation.org.uk/pdf/CRN%20exec%20summary.pdf>

Greenspace and Quality of Life : a critical literature review. Greenspace Scotland. 2008

<http://www.greenspacescotland.org.uk/default.asp?page=464>

Health, place and nature: how outdoor environments influence health and well-being – a knowledge base. Sustainable Development Commission. 2008

<http://www.sd-commission.org.uk/publications.php?id=712>

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Khattak, A J, Rodriguez, D (2005). Travel Behavior in Neo-Traditional Neighborhood Developments: A Case Study In USA. *Transportation Research A*, Vol. 39, No. 6, July 2005, pp. 481-500.

Kuo et al (1998). Fertile ground for community: Inner-city neighborhood common spaces. *American Journal of Community Psychology* 26: 823-851.

Kuo, F E, and W C Sullivan. (2001). Environment and crime in the inner city: Does vegetation reduce crime? *Environment and Behavior* 33:343-367.

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Lefkowitz, E S, Garland, C F – Sunlight, vitamin D, and ovarian cancer mortality rates in US women. *International Journal of Epidemiology* 1994; 23:1133-36.

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