GREEN INFRASTRUCTURE

COMHAR SDC WEB MATERIALS

Comhar SDC

Floor 2,
Block 7,
Irish Life Centre,
Dublin 1.

Phone: 353 1 8882734
E-mail:
niamh.kirwan@environ.ie

Compiled by Comhar SDC

The Sustainable Development Council

http://www.comharsdc.ie

What is Green Infrastructure?

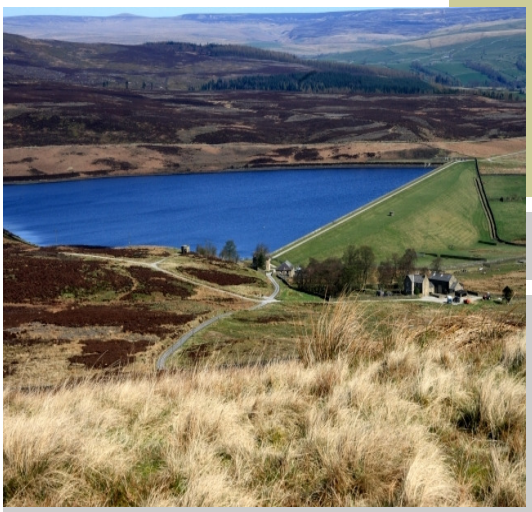
Green Infrastructure, through a properly functioning biodiversity, provides space for nature to deliver vital ecological services that underpin our quality of life. Green Infrastructure can be broadly defined as an interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to human populations.

Biodiversity continues to decline because its value is not reflected in decision making by business and Government. Green Infrastructure seeks to address this problem by providing a spatial evidence base which highlights the value of biodiversity and ecosystem services to the economy and society.

At a practical level, it provides physical space for natural processes to take place. This benefits biodiversity and also benefits humans through ensuring the provision of ecosystem services, such as clean air and fresh water. Green Infrastructures and its ecosystem goods and services should be viewed as critical infrastructure for Ireland in the same way as our transport and energy networks are seen as vital to sustainable development.

Green Infrastructure is about connectivity. Each individual green space should link into a larger network that incorporates other public and private green spaces in the area. Physical linkages lie at the heart of green Infrastructure, but other linkages are also important. Green Infrastructure should provide multiple social, environmental and economic benefits. For example, there may be areas where farming, forestry, recreation and conservation efforts take place in the same space.

Green Infrastructure offers cost-effective opportunities to meet policy goals. It is cheaper to make investments rather than restoring damaged ecosystems or implementing man-made solutions. Integration of the Green Infrastructure approach can be smart and strategic and offer potential ways of effectively integrating biodiversity into sectoral considerations. This is a real challenge for biodiversity policy and its implementation, and we need to find more effective ways of doing this to make progress in halting biodiversity loss. Green Infrastructure sets out a positive vision for the environment.



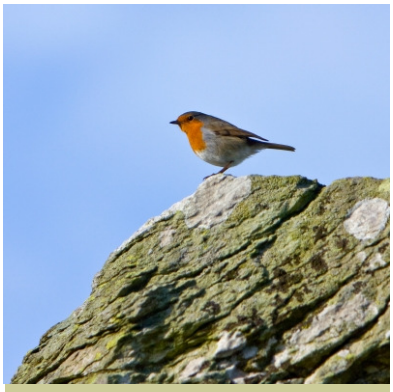
Creating Green Infrastructure

Comhar have launched a research report focusing on Green Infrastructure, entitled 'Creating Green Infrastructure for Ireland'. The report sets out a broad definition of Green Infrastructure and explores and proposes an approach and a set of principles that should be followed in Green Infrastructure planning.

The Green Infrastructure approach outlined in the report is achievable and sufficiently flexible to reflect local priorities while fitting within a national and international framework. Implementing EU targets on biodiversity (see page 2) will be extremely challenging for Ireland and will require new approaches and solutions. These will require an integrated and cross-sectoral approach. A focus on planning or nature conservation alone cannot deliver the actions required and will require the embedding of approaches such as Green Infrastructure in policy and practice.

This leaflet provides background information on a Green Infrastructure approach. It first outlines the benefits for biodiversity, and then explores how Green Infrastructure can help us adapt to climate change, and provide economic, social and health benefits. The final section offers more detail on the Comhar research report.

The Value of Biodiversity



Biodiversity is the diversity of species, habitats and ecosystems on earth. Biodiversity, ecosystems and natural resources are what makes up our natural capital. Biodiversity and ecosystems provide a lot of services to people for free. These include food and freshwater, control of climate and disease, soil formation and recreational opportunities. These are essential to our wellbeing and survival.

Because biodiversity and ecosystems provide these services for free, their value is often overlooked and not taken into account in economic decisions. An estimate of the value of some ecosystem services was calculated for Ireland at €2.6 billion per annum[1]. By 2050, loss of biodiversity under a business as usual scenario could cost up to 7% of global GDP[2].

Policy

In 2010, the European Council committed to a new vision for biodiversity. This includes a target to halt the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, restore them in so far as possible and step up the European contribution to averting global biodiversity loss. Ireland as part of the EU has committed to this target.

The European Commission is developing a Green Infrastructure strategy for Europe.

Our Impact on Biodiversity

We depend on nature for many services, such as protection from flooding, water purification and pollination of crops

Humans have always impacted on biodiversity. In recent centuries, however, we have been using up the earth's natural resources at an increasingly rapid rate through increased consumption and economic development.

Ecosystem services we take for granted, for example the pollination of crops by bees, may not function as effectively in the future. The main stress factors at the present time are land conversion, habitat fragmentation and habitat loss, agricultural change, invasive species, diseases, (nutrient) pollution and ecosystem depletion[3].

Global land-use changes are responsible for lost ecosystem services worth around 50 billion euro each year [2]. This is destructive to the habitats themselves, but also sub-divides the land into smaller sections, until only patches of original habitat remain. The patches are often too small and too far apart to support the needs of many species. We need to make sure that we provide space for species to survive and move.

These problems have been caused by humans and will worsen with man-made climate change.

The Role of Green Infrastructure

Linking Habitats

Protected sites, where nature is given the highest priority have been designated under the Natura 2000 network. However, we need to look beyond protected sites and provide space for biodiversity more generally.

Green Infrastructure reconnects habitats which had been separated by development creating physical space for natural processes to take place.

Linking fragmented habitats and landscape features is more beneficial than designating isolated patches and creates new spaces for wildlife. It allows the dispersal and migration of individual species and whole habitats[5] .

This could be through wildlife corridors, stepping stones and other features that are more permeable and accessible for wildlife.

Legislation

As Green Infrastructure emphasises proactive management and not just protection of the environment, it also has particular potential to

European Directives (Habitats, Birds, Water Framework and Floods). It provides a path through the increasingly complicated legislative framework.

Human Benefits

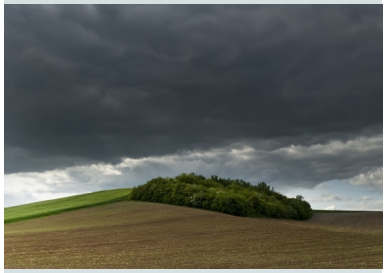
Green Infrastructure also has many benefits for people, which are outlined on the next page.

Green Infrastructure and Climate Change

The scientific evidence showing that the earth's climate is changing is well established, as is the fact that much of this is due to man-made greenhouse gas emissions[4].

The main impacts include temperature extremes, changing precipitation rates, sea level rise, habitat destruction, increased disease transmission, changes in agricultural productivity, changes in water availability, changes in ocean chemistry and an increase in the frequency and intensity of extreme events[4].

A well-designed network of Green Infrastructure alleviates the impacts of climate change, such as flooding and the heat-island effect.



For example, good coastal wetlands can improve protection against rising sea levels and healthy floodplains and other wetland ecosystems can limit the effects of river flooding. Green Infrastructure provides effective eco-system services that are expensive and difficult to replace with man-made solutions.

A well-designed network of Green Infrastructure alleviates the impacts of climate change

Economic and Social Benefits of Green Infrastructure

Alongside climate change, we face the challenge of a global economic crisis. Developing the green economy can create new jobs, limit the environmental impact of towns and cities, and reduce the costs of running them. Green Infrastructure provides a high-quality environmental setting attracting new businesses and which directly serve the tourism, recreation, leisure and health sectors.

Attractive settings add to the value of the land and property. Urban housing developments that are adjacent to natural amenities such as woodland, parks, waterways and the coastline are more attractive to buyers and this is often reflected in market prices[5].

Green Infrastructure provides a high-quality environmental setting attracting new business

Sustainable responses to climate change and economic difficulties can also help to solve social problems, such as fuel poverty and traffic congestion. Quality greenspaces have positive benefits for people living in deprived urban communities. A study looking at the effect of nature on those living in poverty found that poor inner-city environments generate chronic mental fatigue through crowding, noise, together with the stresses of poverty and single parenting. The research found that nature has a rejuvenating quality in tackling mental fatigue and improves the ability of individuals to manage major life issues[6].

Health Benefits of Green Infrastructure

Research shows that reduced access to the natural environment can result in social isolation, obesity and chronic stress[7].

People in urban areas exercise more when there are nearby green spaces.

Green spaces also act as a filter to improve air quality. Vegetation improves air quality through removing gas and dust related pollutants[8].

Human contact with nature is recognised as valuable for our mental health. A Swiss study in a forest park found that visitors reported decreases in headaches and in their levels of stress. The positive effects increased with the length of stay and with the level of physical activity undertaken[9].

Green Infrastructure provides space for exercise and contact with nature, which is essential for good physical and mental health

Creating Green Infrastructure

The Comhar Research report 'Creating Green Infrastructure for Ireland' assesses the potential of the Green Infrastructure approaches in Ireland and investigates and illustrates potential planning and implementation methodologies and tools.

The report sets out how Green Infrastructure might be identified and mapped through three case studies for sample areas covering different general landscape and context types. They included an urban area, a peri-urban area and a more regional rural area. The case studies are illustrative only. Their principal value is to demonstrate that the approach is flexible enough to be useful in different areas with different types of Green Infrastructure. The areas covered include an area of north Dublin city covering approximately the Dublin 3 postal area; the Broadmeadow catchment area in Fingal, north of Dublin city incorporating suburban towns and rural countryside; and an area of Offaly-Westmeath that is predominantly agricultural with large areas of exploited peatlands. Each case study highlights the existing green Infrastructure in that area, and what improvements are necessary to protect and enhance it.

In contrast to the traditional approach to planning, Green Infrastructure planning gives priority to environmental assets. In urban and peri-urban areas it raises the profile of surviving natural and man made green features and supports the development of an integrated network of multifunctional green spaces. In rural areas it is likely to support water quality management planning under relevant EU Directives, highlight the most suitable areas for agri-environmental supports, forestry development and suitable areas for activity tourism and recreation based on the natural environment.

A range of recommendations are set out to support the proper and appropriate use of the Green Infrastructure approach in an Irish context. These include the development of national guidance and objectives; the inclusion of green infrastructure in policy and legislation; green infrastructure maps, and measures to improve data availability and harmonisation. The report is available on the Comhar SDC website http://www.comharsdc.ie.

Comhar SDC

Sustainable development is a continuous process of environmental, social and economic development which aims to deliver wellbeing for people now and in the future.

The Irish Government has commitments on sustainable development which come from an international, EU and national level. Sustainable development is based on active participation with key stakeholders and sectoral interests. Comhar SDC is the key organisation in Ireland providing for sectoral and stakeholder engagement on implementing sustainable development. Comhar SDC conducts research on the best ways to achieve sustainable development in Ireland. Details of our current research are available on the Comhar website http://www.comharsdc.ie.

The Council is multi-stakeholder. It is made up for 25 people drawn from five sectors; the State sector, economic sector, environmental NGOs, social/community NGOs and the professional/academic sector. Comhar is also supported by a full-time secretariat based in the Irish Life Centre. Comhar SDC is currently chaired by Professor Frank Convery.

References

1. DoEHLG (2008) The Economic and Social Aspects of Biodiversity: Benefits and Costs of Biodiversity in Ireland, Department of Environment, Heritage and Local Government, Available on http://www.environ.ie/en/Publications/Heritage/NatureConservation/
2. Braat L. & P. ten Brink, (eds.), with J. Bakkes, K. Bolt, I. Braeuer, B. ten Brink, A. Chiabai, H. Ding,H. Gerdes, M. Jeuken, M. Kettunen, U. Kirchholtes, C. Klok, A. Markandya, P. Nunes, M. Van Oorschot, N. Peralta-Bezerra, M. Rayment, C. Travisi, M. Walpole, (2008) The Cost of Policy Inaction, The case of not meeting the 2010 biodiversity target, Wageningen, Alterra, Alterra-rapport.
3. Millennium Ecosystem Services (2005) Ecosystems and Human Well-being, Millennium Ecosystem Assessment, Available on http://www.millenniumassessment.org/en/Framework.aspx
4. IPCC (2007) Climate Change 2007: Synthesis Report, Intergovernmental Panel on Climate Change, Available on http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf.
5. UCD Urban Institute Ireland, Dun Laoghaire Rathdown County Council & Fingal County Council (2008) Green City Guidelines: Advice for the protection and enhancement of biodiversity in medium to high density urban developments, Available on http://www.uep.ie/news/greencity.htm
6. Kuo, F. (2001) Coping with poverty: impacts of environment and attention in the inner city, *Environment & Behaviour,* Vol. 33, No. 1, pp. 5-34.
7. Institute of Public Health (2006) Health Impacts of the Built Environment: A Review, Available on http://www.publichealth.ie/files/file/Health_Impacts_of_the_Built_Environment_A_Review.pdf
8. Bolund, P. and S. Hunhammar (1999) Ecosystem services in urban areas, *Ecological Economics*, Vol. 29, No. 2, pp. 293-301.
9. Hansmann, Ralf , Hug, Stella-Maria and Seeland, Klaus (2007) Restoration and stress relief through physical activities in forests and parks, *Urban forestry & urban greening*, Vol. 6, No. 4, pp. 115.

All images attained from http://www.freedigitalphotos.net/ (Photographers in order of photo appearance- Tom Curtis; Tina Phillips; Darren Robertson; Dan; Suat Eman; Tom Curtis; Tom Curtis).
This leaflet was published by Comhar SDC (2010). It is available on the Comhar website http://www.comharsdc.ie.