



Environmental Protection Agency



# EcoPlan

Delivering Green Infrastructure



## GI Planning in Ireland

## Emergence & State-of-the-Art



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## **Executive Summary**

By early 2008, new planning policy initiatives concerning green space management had sought to reconcile biodiversity conservation with recreational space provision. Paralleling this was the rising popularity of the ecosystems services paradigm which helped prompt new perspectives on conservation policy that increasingly viewed elements of the natural and semi-natural environment as 'ecological assets'. A conference in Malahide in November 2008 announced the emergence GI as an alternative to prevailing green space management approaches that focused on reactive measures directed at a limited range of functions and protected site designation. This new GI approach centred on 'multifunctionality' and 'spatial connectivity'. Since 2008 a considerable expansion in the perceived spatial and functional applicability of a GI approach has occurred. Almost all spatial typographies are now considered as potential elements of GI. Simultaneously, the functions of GI have been expanded to include among other issues, economic development and archaeological conservation. By the winter of 2011, GI had achieved representation in planning guidance at national, regional and local levels, while also enjoying reference in many non-statutory planning policy documents. However, with the exception of Galway City Council, the most comprehensive representation of GI was in the Greater Dublin Area, and more specifically within the local authorities comprising the Dublin metropolitan region. This eastern and urban bias continued through 2012 and into 2013. Recent initiatives in the Dublin metropolitan region exemplify proactive and pioneering GI approaches that sensitively cater for urban growth while concurrently enhancing ecological integrity.

## **1 Introduction**

This report seeks to provide a concise yet comprehensive study of Irish national, regional and local level spatial planning policy concerning GI. It does so by first identifying the immediate policy precursors to a specific GI planning approach. The report then traces the emergence, evolution and institutionalisation of GI planning approaches throughout various arenas of planning governance. An analysis of recent trends in GI planning initiatives is provided. The report thus furnishes a useful baseline resource for the development of future practice regarding the integration of the ecosystems services paradigm into Irish spatial planning activity via the GI concept.

## **2 The Emergence of GI**

### **2.1 The Policy Backdrop to GI Planning Approaches (2002- 2007)**

#### **2.1.1 National Initiatives**

The first formal reference to green infrastructure (GI) in an Irish policy context occurred in 2002, with the production of a study on ecological networks<sup>i</sup> (Tubridy and O Riain, 2002). Commissioned by the Environmental Protection Agency (EPA), the specified purpose of this study was to inform the then upcoming National Spatial Strategy (DoEHLG, 2002b). GI was here equated with ecological networks and metaphorically explained by reference to more familiar forms of 'grey infrastructure'. The study argued that the fragmentation of habitats was the primary issue threatening Ireland's biodiversity. Ecological networks were presented as a solution to this problem by creating a series of 'corridors' and habitat 'stepping stones' linking habitat 'core areas' (Tubridy and O Riain, 2002, vii). The study concluded that the map based formulation of a national ecological network would help ensure the conservation of Ireland's biodiversity by reversing the trend towards habitat fragmentation.

However, the National Spatial Strategy 2002-2020 (NSS) when finally adopted in November of 2002 made no specific reference to the value of the ecological network ('green infrastructure') approach or its relevance to strategic planning. Instead, the NSS advocates the development of a 'Green Structure' through regional and county level plans and strategies. Rather than foregrounding a concern for the conservation of biodiversity via an

ecological network (i.e. GI) planning approach, the NSS 'Green Structure' approach to planning seeks to balance polycentric urban development with a coordinated strategy for the containment of urban sprawl.

During April of the same year (2002), the first National Biodiversity Plan (DoAHGI, 2002a) was published. Although the plan made reference to the potential use of biodiversity action planning methodologies, there was no reference to an ecological networks/green infrastructure approach to planning. Likewise no reference to ecological networks/green infrastructure planning was made in the Guidelines for the Production of Local Biodiversity Action Plans (DoEHLG, 2002a). These guidelines were prepared and published to provide instruction to local authorities when producing Biodiversity Action Plans in response to the provisions of the National Biodiversity Plan. Similarly, the National Heritage Plan (DoAHGI, 2002b) published in April of the same year made no reference to ecological networks/green infrastructure planning.

This pattern continued over the following two years (2005-2007) with the publication of a number of national plans and strategies by central governmental departments. These included among others, the National Countryside Recreational Strategy (DoCRGA, 2006), the National Rural Development Strategy 2007-2013 (DoAF, 2006) and the National Climate Change Strategy 2007-2012 (DoEHLG, 2007). Whilst many of these documents discussed items of potential pertinence to subsequent conceptions of GI, none made reference to it. However, it is noted that a draft document produced and tabled by Comhar SDC at a GI workshop four years later (8th February 2010) referenced the recreationally orientated 'greenways' approach advocated in the National Countryside Recreational Strategy (DoCRGA, 2006) as a composite element of GI.

### **2.1.2 Regional and Local Initiatives**

Giving regional effect to the National Spatial Strategy (DoEHLG, 2002b), the Regional Planning Guidelines for the Greater Dublin Area 2004-2016 (DRA and MERA, 2004) were published in July 2004. Reflecting the 'Green Structure' approach advocated by the National Spatial Strategy (see above), these guidelines promote the implementation of green belts with a focus on the delineation, containment and servicing of urban areas. The role of these

green belts was primarily viewed as catering for the recreational and visual amenity of the built environment in addition to the maintenance of peri-urban agricultural land uses. No mention was made of the potential function of green belts in the conservation of biodiversity. Extending this focus, the guidelines infer 'ecological benefits' from public open space provision (DRA and MERA, 2004, 162). This presents the first evidence of a nascent shift in emphasis away from the foregrounding of ecological issues in planning for biodiversity towards a multifunctional perspective on natural and semi-natural green spaces<sup>ii</sup>.

In September 2004, South Dublin County Council adopted its County Development Plan for the period 2004-2010 (SDCC, 2004). The 'Natural Heritage' section of this plan focused primarily on the protection of conservation designated sites. Paralleling this was an attentiveness to recreational access provision. In particular, the plan outlined an intention to deliver 'a Green Structure Plan for the county to identify green linkages and to allow for the intensification of use of existing and proposed amenity networks' (SDCC, 2004, 32). It is noted here that the term 'Green Structure' differs from that outlined in the National Spatial Strategy in which it is primarily equated with a coordinated approach to the management of urban generated land use pressures (see section 2.1.1). Additionally, the term 'green linkages' differs from that of the EPA National Ecological Networks study (see section 2.1.1) which focused on the provision of habitat connectivity. Rather, in the case of this plan, such terms are related to the increased use of current and proposed 'green linkages' for amenity purposes.

A few months later in January 2005, Galway City Council adopted its development plan for the 2005-2011 period (GCC, 2005). The recreation amenities provision policies of this plan were not included in an individual or 'community' chapter as was the normal format for such documents at the time, but rather were grouped with policies on biodiversity conservation in a chapter entitled 'Natural Heritage, Recreation and Amenity'. Tacitly suggesting that the existing integration of natural and semi-natural areas for recreational use was poor (GCC, 2005, Section 4.1), the plan sought to facilitate better integration by building on a framework presented in the previous Galway City Development Plan (1999-2005) for the establishment of a 'green network'. The 2005-2011 City Development Plan

outlined how such a network offered the means by which to combine and coordinate the protection of natural heritage areas and facilitate the provision of open space for recreational purposes. One of the primary methods advocated for realising the green network was the creation of 'greenways'. These were defined as 'pedestrian and cycle ways separated from road traffic' (GCC, 2005, Section 4.3). This presentation of the Council's green network 'greenways approach' as a means for the provision of transport, recreational and habitat connectivity echoes the language, if not necessarily the content, of both the 'green structure plan' of the South Dublin County Development Plan 2004-2010 and the ecological networks/green infrastructure approach of the 2002 EPA National Ecological Networks study. However, as opposed to the EPA study, this evolving approach increasingly sought to accommodate the multifunctional potential of green spaces.

Adopted two months after the Galway City Development Plan, the Dublin City Development Plan 2005-2011 (DCC, 2005), echoes this shift towards a more multifunctional perspective on public open space. Indeed, Chapter 11 of the plan entitled 'Recreational Amenity and Open Space' envisaged that open space would furnish '...green chains or networks, which allow for walking and cycling and facilitate biodiversity' (DCC, 2005, 84). Policies contained in this plan are indicative of an inchoate change in how biodiversity conservation was conceived. This change comprised an interpretation of biodiversity as something, which like recreational amenities, can be enhanced via proactive planning, rather than simply protected by reactive designations<sup>iii</sup>.

Although proximate to the Dublin City Development Plan (DCC, 2005) in both time of adoption and administrative space, the Fingal County Development Plan 2005-2011 (FCC, 2005a) adopted in June of 2005 made little mention of biodiversity protection in its chapter on 'Open Space and Recreation'. Rather, such references were largely confined to Chapter 8 of the plan entitled 'Heritage and Conservation'. In proposing to protect and enhance its non-designated conservation habitats, the Council promoted the creation of a countywide 'ecological network' comprising 'core areas' linked by 'corridors' and 'stepping stones' (FCC, 2005a, 150). The Council's Heritage Plan (FCC, 2005b) adopted the month following the County Development Plan further promotes this ecological networks approach.

By 2008 the desire to promote multifunctional green space planning was once again a powerful discourse in Irish planning guidance documentation. In January of that year, Galway City Council published a non-statutory but high profile planning guidance document, entitled Galway City Recreational and Amenity Needs Study (GCC, 2008). This document extended the 'green network' concept advocated in the Galway City Development Plan 2005-2011 by enthusiastically promoting the development of such a network that, '...allows for nature protection and for the enhancement and expansion of passive and active recreation opportunities in tandem with the expansion of the city' (GCC, 2008, 6). Whilst noting that recreational land uses are not always commensurate with ecological protection, the study proclaims that, 'Recreation and amenity can help to bring about positive environmental impacts to an area of high biodiversity if carefully designed and managed. Areas at risk of decline or under threat can be restored and protected whilst allowing access for use by the community' (GCC, 2008, 16).

## **2.2 The Emergence of Specific GI Approaches (2008)**

### **2.2.1 Ecosystems Services Perspectives**

By early 2008, the recalibration of discourses on ecological/green networks from nature conservation via the protective designation of sites towards conservation by proactive planning of networks was furthered through an emerging focus on ecosystems services. The first formal recognition of this in a planning context appears in the Dublin City Council Biodiversity Action Plan 2008-2012<sup>iv</sup> adopted in February 2008. This plan echoed the 2002 EPA National Ecological Networks study in noting habitat fragmentation as a major threat to biodiversity and the consequent requirement for 'physical links' between habitats. However, rather than foregrounding the conservation of biodiversity for its intrinsic value as the EPA study had done, this plan outlines the importance of biodiversity and the consequent rationale for its protection, by accentuating the benefits to 'our well-being' (DCC, 2008, 9) of the 'ecosystem services' delivered to society by biodiversity. This conceptual realignment is outlined in the plan's introduction where under the heading 'Why is biodiversity important', it states,

*...loss of biodiversity at the ecosystem, species and gene level is an issue of serious concern not only because of the ethical issues raised but also due to the decline in ecosystem services which natural systems provide. These services include production of food, fuel, fibre, medicines, regulation of water, air, climate, maintenance of soil fertility, cycling and nutrients. (DCC, 2008, 9)*

Although an ethical dimension is presented, biodiversity conservation is primarily addressed as a service provider and regulator for the benefit of society. Elaborating this 'ecosystems services' perspective was a document produced in May 2008 by the Department of the Environment Heritage and Local Government entitled, 'The Economic and Social Aspects of biodiversity: Benefits and Costs of Biodiversity in Ireland' (DoEHLG, 2008). Referencing various sources and employing a monetary calculation of the value of ecosystems services to society, this document cogently asserts that,

*The incentive to protect biodiversity does not simply arise from a benevolence towards the natural world. Rather, a high level of biodiversity also ensures that we are supplied with the 'ecosystem services' that are essential to the sustainability of our standard of living and to our survival. (DoEHLG, 2008, 5)*

This document proposes a cost-benefit analysis of the economic value of ecosystem services. These more recent planning discourses not only imply a concentration on the necessity of biodiversity for the maintenance of society, but also align arguments for the protection of biodiversity with facilitating economic development.

### **2.2.2 The Emergence of 'GI'**

In 2007 University College Dublin (UCD) and Natura Ecological Consultants Ltd. combined efforts with Dublin City Council (DCC), Dun Laoghaire Rathdown County Council (DLRCC) and Fingal County Council (FCC) to produce the Green City Guidelines (2008). These were published in mid-2008 and assert a multifunctional perspective on green space provision. This interpretation is articulated beneath the rubric of 'green infrastructure' when in quoting Girling and Kellett (2005) the guidelines declare that,

*Urban green space includes everything in cities that has vegetation. Collectively it is sometimes referred to as “Green infrastructure”, encompassing the entire working landscape in cities that serve roles such as improving air quality, flood protection and pollution control.*

(UCD et al., 2008, 10)

This was the first mention of GI in an Irish planning document since the EPA National Ecological Networks study in 2002 (see section 2.1.1). The EPA study equated GI with the concept of an ecological network in which biodiversity protection was foregrounded on the basis of the intrinsic value of nature. However, these guidelines reflect the post-2002 evolution of ‘networked’ concepts of green space governance by repositioning policy approaches to ecosystems from reactive protection by site designation to proactively planning for their enhancement as something of multifunctional ‘value’ in facilitating urban development in a manner that ensures ‘our standard of living’ (DoEHLG, 2008, 5) and ‘well-being’ (DCC, 2008, 9).

In November of the same year (2008), Fingal County Council, one of the authors of the Green City Guidelines, in association with the Irish Planning and Irish Landscape Institutes, and the Institute of Ecological and Environmental Management, organised an international conference on GI in Malahide, County Dublin. This high profile conference was addressed by the Minister for Environment, Heritage and Local Government along with national and international speakers from various universities, central and local government, QANGOs<sup>v</sup> and NGOs<sup>vi</sup>. Presentations consisted of a wide range of internationally sourced examples of GI planning and a number of talks on Ireland’s requirements under the European Union Habitats (1992) and Water Framework Directives (2000). These latter presentations cursorily referenced the term ‘GI’, focusing primarily on meeting commitments specified by the provisions of international agreements and European legislation. However, three presentations specifically regarding GI planning in Ireland were provided. Two of these were by officers of Fingal County Council (FCC), while the third was delivered by the Head of Policy and Research at the Heritage Council<sup>vii</sup>. Both presentations from FCC stressed the utility of GI in assisting management of urban growth pressures within the county. One such presentation illustrated the multifunctionality inherent to the GI concept by offering examples of GI strategies initiated by the Council wherein details on flood plain

management, habitat conservation, as well as passive and active recreation land uses were furnished (Logan, 2008). The presentation provided by the Heritage Council promoted a recreational and mobility focused perspective on GI but concurrently noted the possible uses of GI in climate change mitigation, the protection of landscape distinctiveness, ecosystems services, providing attractive places to live and work, reversing habitat fragmentation and helping to meet Ireland's legislative requirements under European Union Directives. With a particular focus on 'greenways' as facilitating access to the countryside and heritage sites, in addition to their use for awareness raising of heritage management systems, the Heritage Council's approach echoed the 'green network' approach previously advocated by Galway City Council (see section 2.1.2) in promoting the integration of ecology with recreational land uses.

### **3 State-of-the-Art**

#### **3.1 Expounding and Institutionalising GI Planning Approaches (2009-2011)**

##### **3.1.1 Valuing Nature**

In March 2009, Dr. Gerry Clabby, Heritage Officer in Fingal County Council and a presenter at the GI conference a few months previously, published a guest commentary<sup>viii</sup> on the Comhar SDC website entitled 'Green Infrastructure: Critical Infrastructure for a Smart Economy' (Clabby, 2009). Here Dr. Clabby compared GI to conventional understandings of the term 'infrastructure' before outlining numerous international examples of how the networks of green spaces he described as GI are managed. Summarising the societal benefits of GI, Dr Clabby noted its importance: in the mitigation of urban heat island effects; recreation and mental health amenities provision; flood risk management; compliance with E.U. legislative requirements; increasing land values; attracting tourist and business interests; and in the facilitation of national economic recovery. Dr Clabby's exposition illustrates a broadening conception of the multifunctional potential of green spaces intrinsic to a GI planning approach. Extending this comprehension, Dr. Clabby's focus on GI as facilitating economic recovery during a period of international financial crisis, suggests an increasing perception of GI planning as a means to transform traditional views of conservation initiatives as growth inhibiting. Rather, Dr Clabby's exposition demonstrates an alternate perspective wherein a GI planning approach emphasises the potential for

ecosystems conservation to work with, as opposed to against, economic development. As noted in his commentary,

*Land-use planning is one of the key areas where we need to successfully integrate environmental considerations if we are to move towards a 'Smart Economy'. A key to achieving this is finding ways in which we can align environmental and economic goals in the planning system. Green infrastructure planning provides a practical way in which to do this. (Clabby, 2009)*

Outlining how GI can achieve such economic goals, Dr Clabby declared that,

*It [GI] recognises the fundamental contribution that green space makes to our quality of life, and then aims to plan for its protection, provision and management in a comprehensive way in **tandem** with plans for growth and development. (Clabby, 2009) [Emphasis in original]*

In this sense, GI is expressed as a means by which to facilitate coordinated growth and development in a manner that enhances 'our quality of life'. Echoing the 'green network' approach advocated by Galway City Council a year previously (GCC, 2008), GI is here presented as a planning mechanism centred on reconciling the desire to enable development as well as protect the environment.

In September 2009, the Draft South Dublin Development Plan 2010-2016 (SDCC, 2009) was placed on public consultation display, and subsequently adopted in October 2010 (SDCC, 2010). Whereas the previous development plan for the area (2005-2010) promoted a 'Green Structure' that conceived a networked approach as primarily providing recreational amenities (see section 2.1.2), this plan, adopted five years later, equates 'linked' and 'interconnected' open space provision as catering both for 'recreational needs' and the provision of 'valuable wildlife corridors'. Furthermore, such provision is seen as forming 'a significant green infrastructure in the County' (SDCC, 2010, 95). Thus, GI as a networked approach to planning is once again represented as a network of multifunctional land uses

servicing recreational needs and biodiversity conservation. Echoing the approach adopted by the Galway City Development Plan 2005-2011 and the Galway City Recreational and Amenity Needs Study 2008 (see section 2.1.2), it is conceived that these 'green networks' will,

*...function as long distance walking and cycling routes as well as ecological corridors such as canals. Green networks are vital to the maintenance and facilitation of ecological corridors such as those found along major transport routes. Their main function is to link parks and other 'green' infrastructure. (SDCC, 2010, 96)*

The suggestion here is that the function of green networks 'is to link parks' for recreational and biodiversity uses, whereas GI is perceived as something broader than these links. As such, it is implied that 'GI' subsumes recreational amenities and ecological corridors, but also includes additional land uses. Although never specified, these other land uses appear to embrace the plan's array of networked planning approaches, each with functional priorities but all preceded by the prefix 'green'. These approaches include a 'green routes network' comprising '...the creation of a network of cycling and walking routes throughout the County' (SDCC, 2010, 98), in addition to the 'the creation of a Green Structure in accordance with the National Spatial Strategy' (SDCC, 2010, 246) and the designation of 'green belt' areas 'to protect the special amenity value of the countryside' (SDCC, 2010, 257). Furthermore, Section 4.3 of the plan states that the Council's aim for 'Landscape, Natural Heritage and Amenities' is that this 'well defined and linked' (SDCC, 2010, 246) approach necessitates the development of,

*...a strategy for the creation of a Green Infrastructure for the County, promoting a balance between the protection of areas of high amenity, the facilitation of recreational use, and the provision of a network of sustainable wildlife corridors throughout the County. (SDCC, 2010, 246)*

'Areas of high amenity' are here considered in terms of landscape aesthetics and referenced to a citation from Section 10 of the Planning and Development Act 2000-2007 (Oireachtas, 2000) regarding the onus on local authorities to '...include objectives relating to the preservation of the character of the landscape...' (SDCC, 2010, 246).

Thus, the plan seeks to include 'the protection of areas of high amenity' with the existing pairing of recreational and ecological conservation land uses within its green infrastructure approach. The meaning of such green infrastructure is defined in plan as,

*...a strategically planned and delivered network of high quality green spaces and other environmental features. It should be designed and managed as a multifunctional resource capable of delivering a wide range of environmental and quality of life benefits for local communities. Green infrastructure includes parks, open spaces, playing fields, woodlands and allotments and private gardens. (SDCC, 2010, 257)*

This exposition of GI suggests a representation similar to that advocated almost two years previously by Galway City Council in its 'green network' approach (see section 2.1.2). Thus, GI as a 'multifunctional resource' is articulated in terms of its value as something which can be 'planned', 'designed' and 'managed' so that it is 'capable of delivering' 'benefits' to society. Additionally, the composite elements of GI are expanded from those of public open spaces to 'allotments and private gardens'.

In December 2009, three months subsequent to the placing of the Draft South Dublin County Development Plan 2010-2016 on public consultation display, Dublin City Council also placed its Draft Dublin City Development Plan 2011-2017 (DCC, 2009) on public consultation display. This plan was subsequently adopted in November 2010 (DCC, 2010). Whereas the previous Dublin City Development Plan 2005-2010 had promoted a 'networked planning approach' that aligned the provision of recreational amenities with habitat conservation (see section 2.1.2), it had not specified this as 'GI' per se. In contrast, the Dublin City Development Plan 2011-2017 is unambiguous in its promotion of GI and declares that,

*A key priority of this Development Plan is to reinforce the importance of green infrastructure, recreation and biodiversity as a vital component of a compact city. The introduction of a green infrastructure strategy reflects an integrated approach to the city's open space, recreational, landscape and biodiversity assets. (DCC, 2010, 23)*

As with the approach of the South Dublin County Development Plan 2010-2016 adopted just two months earlier, this statement announces the Council's intention to 'integrate' recreational amenity provision, landscape protection and habitat conservation within a multifaceted GI approach to the planning, design and management of the city's open spaces. Moreover, the provisions of the Dublin City Development Plan 2011-2017 expand the functions of GI from that expounded by South Dublin Council to include the delivery of additional services to urban residents. This is undertaken by extending the multifunctionality potential of ecosystems services outlined in the Dublin City Council Biodiversity Action Plan 2008-2012, and broadening the interpretation of GI to include a multitude of additional land uses. Specifically, the plan outlines how sustainable urban drainage systems (SUDS) 'forms an integral part of green infrastructure' (DCC, 2010, 76), while Section 6.4.1 of the plan expands the interpretation of GI to include archaeological and heritage sites, coastal areas, brownfield sites, as well as drainage and flood management.

In early February 2010, Comhar SDC organised a workshop on GI in which it presented for discussion the draft conclusions and case studies from a GI study commissioned in August 2009 (Comhar, 8th February 2010). Addressing an invited audience of professionals and identified stakeholders, the consultant team employed by Comhar SDC to produce the study presented a quantitative data-based cartographic methodology for the planning and design of GI. Examples of maps produced using this method were displayed and discussed. Responses from the floor were requested and received. Advocating GI as an answer to many problems whose variously promoted solutions did not enjoy universal ascription<sup>ix</sup>, the workshop was significant in giving representation to a cartographic dynamic in the conception of GI. As an additional element to GI discussions, this approach furnished a

methodological template largely absent from GI planning and emphasised the centrality of mapping quantitatively sourced data.

The Draft Galway City Development Plan 2011-2017 (GCC, 2010), published in the same month (February 2010), and formally adopted twelve months later in February 2011 (GCC, 2011), outlines an intention to maintain the 'green network' planning approach advocated in its previous plan (see section 2.1.2). Equating its 'green network' with GI, the plan stresses the many advantages of this approach by declaring,

*The development of 'green infrastructure' and the availability of recreation opportunities, facilities and natural amenities are important quality-of-life factors for the location of inward investment and for individuals choosing a place to live. (GCC, 2011, 44)*

Thus, as pronounced by Dr. Clabby in his Comhar SDC commentary issued in March 2009 (see above), the plan seeks to overturn traditional assumptions that nature conservation inhibits economic development by emphasising that a GI planning approaches facilitates economic growth.

Maintaining this perspective, the director of Comhar SDC presented an economics focused argument for the introduction of GI planning at the Irish Planning Institute's Annual Conference in April 2010. This conference, which was organised around the theme of 'Planning for a smarter Ireland', facilitated the presentation of numerous talks centred on how to plan for national, regional and local economic regeneration. Comhar SDC's presentation at the conference employed references to its own 'Towards a Green New Deal' document (Comhar, 2009) to frame GI as part of a multifaceted environmentally sensitive approach that can help reverse the costly loss of 'ecosystems services'. This endorsement of a cost-benefit argument for the adoption GI planning was sustained by Comhar SDC in its presentation at the Parks Professional Network Seminar Day in June 2010, when it was announced that the estimated worth to Ireland of the ecosystems services delivered by GI was €2.6 billion.

### 3.1.2 From Policy Theory to Policy Practice

In the same month as the Irish Planning Institute's Annual Conference (April 2010), Fingal County Council issued for public consultation display its Draft County Development Plan 2011-2017 (FCC, 2010). This was subsequently adopted a year later in April 2011 (FCC, 2011). The plan includes three detailed GI maps in addition to the zoning, transport, architectural and archaeological maps normally associated with such documents. Chapter 3 of this plan is entitled 'Green Infrastructure'. The insertion of the GI chapter prior and adjacent to the subsequent conventional 'Physical Infrastructure' chapter signals an interpretation of GI as a strategically important concept binding together the various economic, physical, environmental and social objectives of the plan. The plan identifies numerous environmental challenges requiring redress and presents GI as a means by which to meet all these in providing,

*...space for nature (or biodiversity) and the natural systems which regulate temperature, reduce storm flows, provide us with clean water and air, and a multitude of other benefits or ecosystem services free of charge. High-quality accessible parks, open spaces and greenways provide health benefits for all...By providing a high-quality environment in which to live and to work green infrastructure helps to attract and to hold on to the high-value industries, entrepreneurs and workers needed to underpin the knowledge economy. In addition it is increasingly being recognised that green infrastructure is a vital component in building resilient communities capable of adapting to the consequences of climate change. (FCC, 2011, 91)*

These qualities of GI are reflected in the Draft Kildare County Development Plan 2011-2017 (KCC, 2010) which was issued for public consultation in April 2010; the same month as the Draft Fingal County Development Plan 2011-2017. It was subsequently adopted in May 2011 (KCC, 2011). Emulating South Dublin County's perspectives on the possibilities of 'designing' GI, the Kildare County Development Plan employs the term GI to describe multiple 'green space' typologies, which form a,

*...strategically planned and delivered network...designed and managed as a multifunctional resource capable of delivering a wide range of environmental and quality of life benefits for local communities. (KCC, 2011, Chp. 14, 19)*

In spring 2010, the Draft Regional Planning Guidelines for the Greater Dublin Area 2010-2022 were issued for public consultation. Whereas the previous guidelines for the region aligned urban generated recreational demands and the conservation of biodiversity in its provision of planning guidance regarding open space (see section 2.1.2), it did not specifically reference GI. In contrast, these new guidelines devote considerable attention to GI planning. Specifically, the guidelines maintain the wide-ranging interpretation of GI advocated in the Fingal and Kildare County Development Plans. They also reflect a paralleling advocacy of GI's multifunctionality, particularly in stressing its ability to facilitate the delivery of ecosystems services. However, unlike previous discussions on GI planning in Ireland, the guidelines advance an understanding of GI as extending beyond urban and peri-urban locations to include the wider rural environment. The promotion of GI in these guidelines is significant for GI planning in Ireland, as following the coming into effect of the Planning and Development (Amendment) Act 2010 (Oireachtas, 2010) in August that same year, all new plans are required to be 'consistent, as far as practicable'<sup>x</sup> with policy provisions issued in strategies at higher tiers in the planning policy hierarchy. Thus, all policy provisions within the seven local planning authority areas comprising the Greater Dublin Area would from August 2010 have to be consistent with the policy provisions of these Regional Planning Guidelines. Against this legislative background, all local authorities within the Greater Dublin Area would thereby have to include policies harmonising with the particular perspective of GI promoted in these guidelines. The adoption of the guidelines in June 2010 present the first formal representation of GI in the planning policy hierarchy as all other GI advocating plans were still in 'draft' (public consultation) format at this time.

While by now having evolved to encompass multiple functions, there persisted a discourse of ecosystems valuation underpinning the rationale for the promotion of a GI approach to planning. This was evidenced in August 2010, when Comhar SDC (2010a) published the finalised version of the GI study it had commissioned twelve months previously (see section

3.1.1). In an extension of a document published almost two years earlier on the ‘The Economic and Social Aspects of Biodiversity’ (DoEHLG, 2008), the study largely represents biodiversity’s ‘value’ in terms of its fiscally framed ecosystems services potential. This is reflected in the study’s numerous references to the consideration of biodiversity beneath the ambit of GI, which in turn is promoted as a means by which to efficiently deliver policy goals. Indeed, the study notes that,

*An ongoing study on The Economics of Ecosystems and Biodiversity (TEEB)...provides evidence that investment in Green Infrastructure offers cost-effective opportunities to meet policy goals. The study shows that it is cheaper to make such investment than restoring damaged ecosystems and that the social benefits that accrue from appropriate investment are of a significantly higher magnitude than the costs. (Comhar, 2010a, 14)*

This concentration on an economic calculus of GI’s value may be explained by Comhar SDC’s assessment of a survey undertaken as part of the study of selected local authority staff. Interpreting the results of this survey, the study concludes that,

*There is general dissatisfaction with the mechanisms currently available to input information on biodiversity to spatial plans. Respondents, to whom the concept was introduced directly for the first time, considered that the concept of Green Infrastructure and mechanism of Green Infrastructure planning will be more attractive than ecological networks because of the clearer focus on benefits to people. (Comhar, 2010a, 22)*

Thus, in promoting GI as a holistic planning approach for the provision of multifunctional spaces, this study suggests the need to fashion GI as a planning mechanism underpinned by a sound economic rationale (Comhar, 2010a, 23).

Echoing this appraisal was the long awaited review and update of the National Biodiversity Plan (DoEHLG, 2010) published in draft consultation format the following month (September 2010). Although this draft plan appeared to support Comhar SDC's position on the economic assessment of ecosystems services as a means to highlight their 'value' to society (DoEHLG, 2010, 20), it adopted a more restricted perspective on the functions of GI, harmonising more with the assertions on GI expressed by the 2008 Green City Guidelines (see section 2.2.2) than with the 2010 Comhar SDC report. Specifically, the draft plan fostered a wholly urban based interpretation of GI's applicability which diverges with the contention by both Comhar SDC (2010a) and the Regional Planning Guidelines (DRA and MERA, 2010) that a GI approach is equally pertinent to rural environments.

### **3.1.3 Institutionalisation**

By the summer of 2010, the GI planning policy concept appeared to be in wide circulation among a community of planning practitioners and allied professionals, with its representation evident in both regional and local level planning policy guidance. Indeed, the regional representation of the concept was further consolidated when in July of that year the Regional Planning Authority for the South-East Region adopted its planning guidelines which make reference, albeit limited, to GI in the context of policy direction on open space provision and biodiversity protection (SERA, 2010). Furthermore, GI was given prominence by Fáilte Ireland<sup>xi</sup> (FI, 2010), in a published document on how to maximise the tourist potential of historic towns. In addition, the inclusion of a limited reference to GI in the Wicklow County Development Plan 2010-2016 (WCC, 2010) and mention in a document produced by the Heritage Council (Anon., 2010) regarding the formulation of a National Landscape Strategy for Ireland, demonstrate the term's growing popularity within the planning policy community.

By autumn 2010, both Clare and Waterford County Councils published proposed amendments to their respective draft county development plans for the period 2011-2017. Both plans were later adopted in January (CECC, 2011) and February 2011 (WDCC, 2011), respectively. Whilst the draft public consultation display of these plans had not included reference to GI, these proposed amendments sought to introduce mention of GI planning. In both cases, reference to a GI approach is included in the adopted plans. Although such

references are limited in scope and specificity, they indicate the movement of the GI discourse beyond urban areas into the policy discourses circulating within more rural planning authorities.

November 2010 witnessed the publication of a document by the Urban Forum<sup>xii</sup> and the Institute of Ecology and Environmental Management (UF and IEEM, 2010), entitled 'Green Infrastructure: A Quality Of Life Issue'. Prepared by a multi-disciplinary team, this document represents the fruit of activities between a number of professional bodies which commenced networking at the Malahide Green Infrastructure Conference in November 2008 (see section 2.2.2). Maintaining a focus on the multifunctional potential of land use, this document asserts that,

*The Green Infrastructure concept involves the planning, management and engineering of green spaces and ecosystems in order to provide specific benefits to society. (UF and IEEM, 2010, 1)*

In the same month, Kilkenny City and County Councils in association with the Heritage Council produced a habitat survey for Kilkenny City (KKCC, 2010b). This survey, which relied heavily on the presentation of mapped data, included a section on GI. In the survey, the councils outline their conception of GI as 'multi-functional' and providing 'a number of ecosystem services' (KKCC, 2010b, 29). The document focuses primarily on habitat classification and management, thereby departing from prevalent discourses on GI by adopting a perspective centred primarily around habitat conservation rather than the social uses of open spaces or the ecosystems services furnished by biodiversity. As such, this document indicates the persistence of an ecology centred understanding of GI that maintains the concept as originally articulated in the EPA study of 2002 (see section 2.1.1). This perspective on GI was subsequently given planning policy representation by the Kilkenny County Council via limited reference in the Local Area Plans for Gowran (KKCC, 2010a), formally adopted in December 2010, and later in the Fidown (KKCC, 2011a) and Piltown (KKCC, 2011b) Local Area Plans, both of which were formally adopted in January 2011.

The proliferation of interpretations and references to GI continued into 2011. One of the first among these was a proposed variation to the Dún Laoghaire Rathdown County Development Plan (DLRCC, 2011) issued for public consultation in January and subsequently adopted in September of 2011. This variation presented a recreation and amenity interpretation of GI in the context of a high density urban environment. The following month observed the issuing for public consultation of a draft Transport Strategy for the Great Dublin Area over the 2011-2030 period in which GI was represented in terms of facilities for non-motorised travel (NTA, 2011). Subsequent months saw reference made to GI within planning documentation with respect to flood risk management (SCC, 2011), long distance walking and cycle routes, as well as with regard to ecological corridors (ATC, 2011). GI was also referenced in connection with the assessment and protection of landscape character (Anon., 2011).

In April of 2011, Dublin City Council advertised its intention to produce a Local Area Plan for the Clongriffin-Belmayne (North Fringe) area (DCC, 2011). Of note is the inclusion of a section titled 'Green Infrastructure & Sustainability' in the Issues Paper produced by the Council for public consultation. In this document, the Council promoted a perspective on GI that specifies it as a network of green spaces which,

*...includes and integrates open spaces, green corridors for cycling and walking, areas of high biodiversity value and recreational areas. (DCC, 2011, 18)*

An identical interpretation was offered in the Issues Paper for the proposed Naas Road Lands Local Area Plan announced by the Council in June 2011, while the Issues Paper for the proposed George's Quay Local Area Plan, released by the Council a month previously, implicitly suggested GI's role in flood risk management and climate change adaptation. The same month (May 2011), witnessed a presentation on GI at the Irish Planning Institute's (IPI) Annual National Conference. This was delivered by one of the authors of the Urban Forum and IEEM document entitled 'Green Infrastructure: A Quality Of Life Issue' (UF and IEEM, 2010)(see above). Included among a schedule of lectures tackling conventional planning practice topics<sup>xiii</sup>, this presentation provided a national platform from which to proclaim the approach's asserted benefits to an audience of public and private sector planning

practitioners. Its endorsement by the IPI also represents the Institute's positive assessment of GI's legitimacy as a planning approach, and signified an official position that it should be widely disseminated. In November 2011, the updated National Biodiversity Plan (DoAHG, 2011) was published. Although making limited reference to GI, and framed within a broader discussion of habitat conservation, this plan states,

*Green infrastructure is a network of green spaces that help conserve natural ecosystems and provide benefits to human populations through water purification, flood control, carbon capture, food production and recreation. Such spaces include woodlands, coastlines, flood plains, hedgerows, city parks and street trees.*  
(DoAHG, 2011, 41)

Although, departing from the urban focused and valuation perspectives of GI asserted in the document's public consultation format, the adopted plan continues to resonate with prevailing interpretations of GI as a 'networked' approach to nature conservation emphasising the society servicing functions of ecosystems. Also of note is the document's alignment with general perceptions on the wide array of land uses and space typologies to which GI is applicable.

In addition to its representation within a plethora of nationally applicable statutory and non-statutory planning documentation, the formal adoption of those local, city and county development plans which in their 2010 public consultation (draft) format had advocated GI, gave the approach official planning recognition in several local planning authority areas and two regional council areas by the end of 2011.

### **3.2 An Established but Varying Approach (2012-Present)**

Although GI has become an established policy discourse at regional and local levels of the planning hierarchy since the GI Conference of 2008 (see section 2.2.2), GI specific planning guidance at a national level is conspicuous by its absence. Thus, GI is currently most often employed at the local authority level. Here, development plans and local area plans are regularly used as the vehicle through which GI policy is formulated and projects developed. Nevertheless, there are variations in the interpretation and application of the GI concept

between local authorities. For example, some local authority plans demonstrate a prioritisation of GI for biodiversity protection, but seek to partially advance a more multifunctional approach to conservation by including recreational open space provision within policies concerning natural heritage management (KCC, 2012). However, many of those local authorities employing the GI concept exercise it as an extension rather than a transformation of traditional approaches to environmental conservation (MCC, 2013; MNCC, 2013). In such instances, GI may be conceived as a re-branding of unifunctional 'ecological-networks' akin to that advanced by the 2002 EPA commissioned study (Tubridy and O Riain, 2002) (see section 2.1.1). By envisaging GI in a manner that confines it to biodiversity conservation, these interpretations risk eroding the multifunctional potential of the concept. Here, issues like flood management, accessible green space provision and non-motorised transport may be perceived in a disjointed fashion as a restricted GI approach is formulated to accord with existing administrative delineations. This phenomenon can be witnessed in the sustained configuration of development plans wherein 'natural heritage' is confined to a distinct plan chapter that is frequently disengaged from other issue-specific policies, such as 'drainage' and 'transport'. In the absence of a section at the beginning of a plan to first outline how a GI approach structures subsequent chapters and policies (FCC, 2011), maintaining the conventional structure of plans in this fashion reinforces existing administrative compartmentalisation and reduces the transformative potential of the GI concept to facilitate the synergistic integration of land uses. To date, this phenomenon seems most pronounced in rural local authorities whose capacity to fully engage a proactive multifunctional GI planning approach may be hampered by resource constraints such as a skills deficit, low staffing and restricted budgets.

With a greater range of skills sets and higher staffing, the urban authorities of the eastern regions have been able to embrace a more progressive GI planning approach. In particular, Dublin City Council and Fingal County Council have sought to advance an integrated perspective to land use governance concerning a spectrum of planning issues. For example, the Naas Road LAP produced by Dublin City Council employs a GI approach,

*...to address legislative and policy requirements in an integrated way across a range of issues, including biodiversity, open space, flooding, surface water management (SuDS) and cultural heritage. (DCC, 2013, 46)*

This plan outlines a GI strategy that seeks 'to create a linked network of strategic open spaces' (DCC, 2013, 47) focused on biodiversity, amenity, movement, water resources and a series of new connected routes. Adopting a proactive approach to the formulation and implementation of GI, the plan innovatively proposes to enhance the local environment and meet numerous policy objectives by using the development management system to sensitively re-expose those sections of the Camac (Cammock) River currently culverted on the site. The plan then proposes to use this open space asset as a spine linking a network of green routes and ecological corridors connecting every development parcel of the plan lands to the Grand Canal via an enhanced Lansdowne Valley Park.

Similarly pioneering are the contiguously located local area plans for Baldoyle-Stapolin (FCC, 2013a) and Portmarnock South (FCC, 2013b) produced by Fingal County Council. These plans employ a GI approach to holistically frame and integrate policy initiatives concerning landscape, biodiversity, sustainable urban drainage, archaeology and built heritage, as well as open space and recreation. Through a detailed and iterative environmental assessment process, both documents negotiate the development constraints posed by various conservation designations (SPA, SAC, Shellfish Waters) in a manner that sensitively accommodates both urban expansion and environmental protection. Included in the plans are new residential areas integrated with parkland, sustainable urban drainage schemes, non-motorised transport routes and spaces for 'urban farming' that are specifically designed to assist community development. A key feature of these plans is thus how they work synergistically in facilitating high quality urban extensions to Baldoyle and Portmarnock while concurrently protecting the ecological integrity of the Baldoyle Estuary.

## 4 Conclusion

This review of the emergence and state-of-the-art of GI planning in Ireland reveals a picture of the concept's emergence and evolution from an ecologically centred 'networked' approach to conservation into a perspective increasingly focused on multifunctionality. Such a reorientation has increasingly sought to emphasise and enhance the variety of ecosystems services green spaces supply. This evolving interpretation of GI may be divided into three broad phases, namely: 2002-2007; 2008; and 2009-present, each of which is summarised below.

### 4.1 First Phase: 2002 to 2007 – Networked Approaches

Between 2002 and 2007, the development of GI planning was characterised by a three period chronological sequence in the realignment of networked approaches to green space policy. This succession commenced with the appearance in 2002 of an 'ecological network' approach that prioritised the conservation of habitats. The popularity of this approach appears to have persisted until 2005 when it was overtaken by a 'green network' concept, which with greater standing in statutory planning guidance, emphasised multifunctionality in the planning and management of natural heritage. The third period, discernible between 2005 and 2008, not only continued the escalating focus on land use multifunctionality, but also extended the increasingly established 'green network' policy discourse to dissolve traditional perspectives on the incommensurability of ecological conservation and anthropocentric land use.

### 4.2 Second Phase: 2008 – GI's Emergence

By early 2008, new planning policy initiatives concerning green space management had sought to reconcile biodiversity conservation with recreational space provision. Paralleling this was the rising popularity of the ecosystems services paradigm which helped prompt new perspectives on conservation policy that increasingly viewed elements of the natural and semi-natural environment as 'ecological assets' (DoEHLG, 2008). The publication of the Green City Guidelines in September of the same year (UCD et al., 2008) observed the reintroduction into planning debates of the term 'GI'. The GI Conference of November 2008 consolidated the reappearance of GI as an alternative and proactive policy approach to

green space management focused on ‘multifunctionality’ and ‘spatial connectivity’. This approach sought to challenge the prevailing concentration on reactive measures directed at a limited range of functions and conservation site designation.

#### **4.3 Third Phase: 2009 to Present – Institutionalisation and Ongoing Evolution**

The period from 2009 to the present has observed a considerable expansion in the spatial and functional applicability of a GI approach. Almost all spatial typographies, including brownfield sites (DCC, 2009) and cultural heritage locations (DRA and MERA, 2010), are now considered as potential elements of GI. Simultaneously, the functions of GI have been expanded to include economic development (Clabby, 2009; Comhar, 2010a, 2010b). Reinforcing this association, 2010 witnessed increasing reference to GI as a means to enhance ecosystems services provision (Comhar, 2010b; DoEHLG, 2010). This year also saw efforts to foster cartographic means for the formulation and implementation of GI planning. Furthermore, evident in late 2010 through to 2011 was the increasing prominence of professional institutes in advocating GI. By the winter of 2011, GI had achieved representation in guidance at national, regional and local levels, while also enjoying reference in many non-statutory planning policy documents. However, with the exception of Galway City Council, the most comprehensive representation of GI was in the Greater Dublin Area, and more specifically within the local authorities comprising the Dublin metropolitan region<sup>xiv</sup>. This eastern and urban bias continued through 2012 and into 2013. Although a number of rural local authorities now seek to promote GI (MCC, 2013; MNCC, 2013), much of this represents an extension of traditional modes of ecological conservation via ‘ecological networks’, rather than a focus on enhancing the multifunctional potential of lands. Nevertheless, recent initiatives by both Dublin City Council and Fingal County Council exemplify proactive and pioneering GI approaches that sensitively cater for urban growth while concurrently enhancing ecological integrity.

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<sup>i</sup> Defined by Tubridy and O Riain, (2002, 1) as, 'a network of sites. Its constituents are: 'core areas' of high biodiversity value and 'corridors' or 'stepping stones', which are linkages between them. In contrast to species or site based conservation, the ecological network approach promotes management of 'linkages' between areas of high biodiversity value, between areas of high and low biodiversity value, between areas used by species for different functions, and between local populations of species. 'Corridors' or linking areas can support species migration, dispersal or daily movements.'

<sup>ii</sup> In referencing the requirements of the National Biodiversity Plan (DoAHGI, 2002a), these guidelines briefly state that planning authorities should identify 'wildlife corridors, which are important for the migration and dispersal of wildlife, and areas of degraded habitat with potential for restoration and enhancement.' (DRA & MERA, 2004, 159). It is interesting to note that despite ostensible citation to the National Biodiversity Plan, the National Biodiversity Plan does not actually reference wildlife corridors, or indeed promote an ecological networks approach to planning. As such, it may be inferred that such a networked approach to nature conservation was assumed to be represented in the National Biodiversity Plan.

<sup>iii</sup> This assumption was outlined and given statutory footing in policies RO1 to RO12 of the plan where it was respectively stated:

*Policy RO1: It is the policy of Dublin City Council to continue to manage and protect public open spaces to meet the social, recreational, conservational and ecological needs of the city...(DCC, 2005, 85)*

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*Policy RO12: It is the policy of Dublin City Council to endeavour to make provision for habitat creation and maintenance and facilitate biodiversity by encouraging the development of linear parks, nature trails, wildlife corridors and urban woodlands. (DCC, 2005, 86)*

<sup>iv</sup> This was produced in response to the requirements of the National Biodiversity Plan 2002-2006

<sup>v</sup> Acronym for 'Quasi-Autonomous Non-Governmental Organisation' (often termed 'Semi-State organisation')

<sup>vi</sup> Acronym for 'Non-Governmental Organisation'

<sup>vii</sup> The Heritage Council is a quasi-autonomous non-governmental organisation (QANGO) established under the Heritage Act of 1995, although it had existed in various guises prior to this. Since 1995, the Heritage Council as a state aid granted body has overseen the production of over 60 publications covering a cross-section of heritage policy, the development of a Heritage Officer network throughout most counties in Ireland, and the allocation of over 18 million euros in grant aid to hundreds of projects throughout the country.

<sup>viii</sup> Comhar SDC was the Irish 'Sustainable Development Council' (SDC). Prior to its dissolution in 2011, Comhar SDC commentaries were published on a fortnightly or monthly basis. They provided a platform for those who were allied to Comhar SDC to express their views on various aspects of sustainable development outside the formal confines of official documentation. As such, they provided a useful insight into the thinking underlying the rationale ostensibly proffered in Comhar SDC's formal publications. Dr. Clabby was on the steering committee of Comhar SDC's Green Infrastructure working group.

<sup>ix</sup> GI was expressed as: supporting landscape characterisation and protection; endorsing the objectives of the E.U. Water Framework and Flood Risk Directives; improving the quality of the rural environment and diversifying rural economies; and attracting tourists.

<sup>x</sup> Previous to the enactment of this legislation, planning policies were only required 'to have regard to' policy provisions issued at higher tiers of the planning policy hierarchy. Planning Authorities must now ensure that their development objectives are consistent, as far as practicable with national and regional strategies (Section 7 of Part 2 of Statutory Instrument No. 30 of 2010: Amendment of Section 10 of the Principal Act)

<sup>xi</sup> Ireland's National Tourism Development Authority

<sup>xii</sup> The Urban Forum is a joint initiative by the five Institutes representing the built environment professions in Ireland; Royal Institute of Architects in Ireland, Society of Chartered Surveyors, Engineers Ireland, Irish Planning Institute and Irish Landscape Institute. The Urban Forum facilitates and promotes debate on issues pertaining to urban planning and urban design within Ireland.

<sup>xiii</sup> The main topics discussed at the conference were changes to planning legislation; quarries and natural resource planning; and urban design

<sup>xiv</sup> Dublin City Council, Dun Laoghaire-Rathdown County Council, South Dublin County Council, and Fingal County Council.