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● **Special Issue: Mainstreaming Green Infrastructure in the Planning System**

NCPT – managing environmental gains and losses

Oliver Hölzinger, Jonathan Sadler, Alister Scott, Nick Grayson and Andrew Marsh explain how a new practical tool enables non-specialists to systematically assess and manage planning and development impacts on natural capital

The Natural Capital Planning Tool (NCPT) is a new site assessment tool developed specifically for the planning context. The NCPT allows the indicative but systematic assessment of the likely impact of proposed plans and developments on green infrastructure (GI) and the ecosystem services it provides to people. The NCPT was designed as a fit-for-purpose Excel tool which can be applied by non-specialists and in a comparatively short period of time; balancing the need for translating complex ecosystem science into meaningful metrics and the time and resource constraints that planning practitioners face in everyday practice.

The tool developers believe that the NCPT will help to create more sustainable places for people and wildlife, while at the same time delivering the housing and infrastructure that the country needs. It also has great potential for operationalising the government's ambition for 'net environmental gains' from the planning system.¹

Green infrastructure, natural capital and planning

Balancing the need for additional housing, and the infrastructure that comes with it, with the need to create sustainable places that satisfy the needs of people and wildlife for decades to come is a major strategic planning challenge. Planning authorities have to deal with diverse and often competing demands, such as affordable housing, biodiversity, climate change, and economic growth.² Planning officers and councillors are expected to balance and satisfy these demands based on incomplete information, and often face a 'document overload' that makes it almost impossible to identify and systematically assess all relevant information related to GI benefits.

One key component of infrastructure, namely GI, often gets eroded in this process. This is partially due to the cross-cutting character of GI as it both affects and is affected by diverse demands from separate sectoral silos, leading to policy inefficiency.³

GI has been championed as a spatial planning tool under the generic heading of nature-based solutions with the potential to integrate these major planning challenges within more holistic social-ecological systems thinking. But this approach is only recently being crystallised into a rapidly developing policy arena. GI provides us with a wide range of ecosystem services, including opportunities for outdoor recreation and its attached health benefits, as well as air quality, water quality, flood risk and climate regulation, to name just a few. Here, we define GI as natural capital (NC) to highlight its asset character.

Information about the impact of new development on NC and ecosystem services is usually not systematically assessed in the planning context. While some of the services and benefits of NC, such as flood risk regulation and biodiversity, are commonly assessed, relevant information is often spread across different planning documents rather than being available in one place. Information on other ecosystem services such as air quality and climate regulation are commonly neglected altogether. Furthermore, assessment is usually approached as a 'tick-box' exercise to achieve minimum standards and requirements, and does not identify the full scope of impacts. This means that being compliant with planning regulations does not necessarily translate into 'net environmental gains' as promoted in the revised National Planning Policy Framework (NPPF).⁴

While more and more planning authorities and developers recognise the importance of systematic

Development Impact Score			
Average Per-Hectare			
Ecosystem Services Impact Scores	Max Possible	Impact Score	Min Possible
1. Harvested Products	+ 0.13	- 3.04	-3.67
2. Biodiversity	+ 4.44	+ 1.24	-0.56
3. Aesthetic Values	+ 2.09	+ 0.58	-1.91
4. Recreation	+ 4.00	+ 0.78	-0.00
5. Water Quality Regulation	+ 1.30	+ 0.37	-1.00
6. Flood Risk Regulation	+ 0.95	+ 0.20	-0.05
7. Air Quality Regulation	+ 0.61	- 0.08	-0.30
8. Local Climate Regulation	+ 2.43	+ 0.62	-1.19
9. Global Climate Regulation	+ 4.22	- 0.15	-0.78
10. Soil Contamination		+ 0.00	
Development Impact Score	+ 20.17	+ 0.51	-9.46

Fig. 1 Example of an NCPT results table

NC management, they often lack the time, resources and expertise to undertake it. Ecosystem science is very complex, and the systematic assessment of ecosystem services provides a challenge even for specialists.⁵ Hence planning practitioners cannot be expected to assess NC impact without assistance. This is why we developed the NCPT – to give planners and developers a tool to enable them to systematically assess and manage the impact of land use changes on ecosystem services.

The NCPT, and how it works

The development of the NCPT was a direct response to the (now revised) NPPF. The original 2012 version stated (in para. 109) that 'The planning system should contribute to and enhance the natural and local environment by [...] recognising the wider benefits of ecosystem services.'⁶ The aim of the NCPT is to translate complex ecosystem science into a tool that can be applied by planning practitioners without requiring extensive expertise, resources or time.

Essentially, the NCPT automatically calculates an impact score for ten ecosystem services, indicating both the direction and magnitude of the impact of a (proposed) plan or development (see Fig. 1). The NCPT indicates, through a simple score, if the change from the existing to the new land uses provides a net gain for each assessed service. Furthermore, the NCPT indicates the minimum/maximum possible scores that the site is capable of providing for each service.

The impact scores are based on a set of habitat scores (for example the air quality regulation potential of a certain land use) as well as a range of multipliers that take into account the local context

(for example, is air quality an issue in the location?) and demand (how many people benefit?). The land use scores and multipliers were informed by expert and stakeholder groups. Impacts are indicated over a timescale of 25 years post-development.

The development of the NCPT was driven by the end-user community from the very beginning – acknowledging the real-world circumstances in which planning practitioners operate. A wide range of project partners were engaged in the development and testing of the NCPT, including academics, government agencies, planning authorities, industry partners, and NGOs. Here, it was essential to balance the need for a quick and simple tool that can be applied by planning practitioners with the need for a robust assessment of complex ecosystem services performance.⁷ How the NCPT works from a user perspective is outlined in Fig. 2 on the next page.

Case studies and impact

The NCPT was tested in different contexts and at different stages of live projects before it was released in 2018. Here, we highlight two case studies, from Birmingham and Central Bedfordshire.⁸

Birmingham City Council tested the NCPT on a masterplan for a new housing development for 5,000-6,000 new homes in the north-east of Birmingham – the Langley Urban Sustainable Extension. The aim was to assess the impact of the design against the ambition to achieve overall NC net gain over a 25-year timeline.

The significance of the Birmingham case study site lay in its acute political sensitivity, as it was the first portion of approved Green Belt release land in the city to come forward. The Birmingham Development Plan had been called in by the

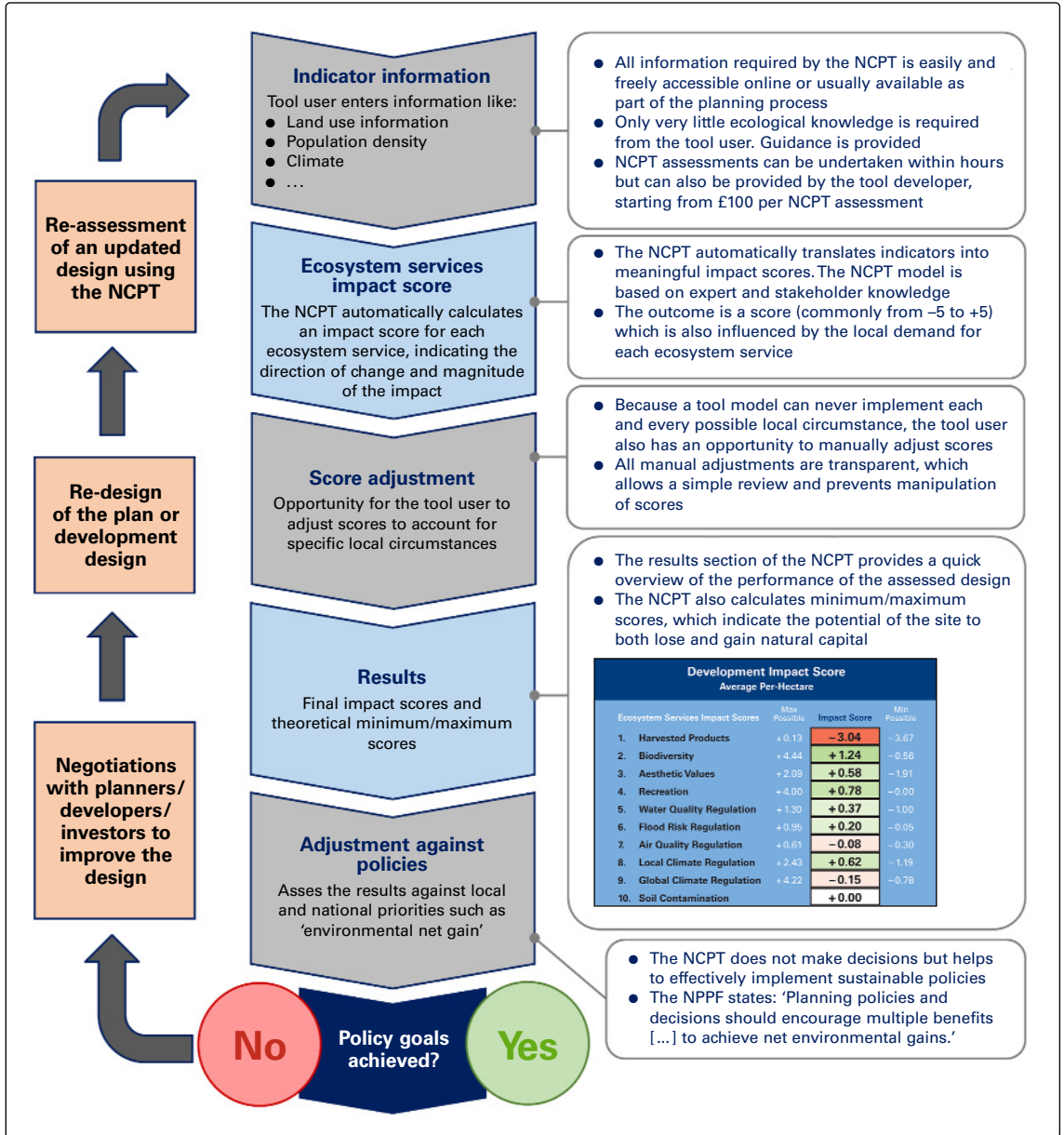


Fig. 2 How the NCPT works, in practical steps

Secretary of State, mainly due to this element of de-designation of Green Belt. So right from the start the public pressure and expectation was for a visually green scheme. The original masterplan certainly delivered on that aim. Ten years ago, it would have been highly likely that this would have met with approval. The interesting difference that the NCPT brought was to fully examine the functionality of the GI involved. Its approach does not necessarily aim to create more GI, but seeks to create GI that can demonstrate that it works harder – delivering multiple benefits from the same land parcel.

The process of assessing this scheme with the NCPT totally shifted both the local planners' and the applicants' view of the GI potential for the site. The influence that the NCPT test has had on the approach can be seen in the draft SPD (Supplementary Planning Document) for the site.⁹ The original green scheme actually failed to demonstrate a net gain across the ten ecosystem services, but the draft SPD now outlines multiple centres inter-linked and permeated by GI (as shown in Fig. 3 on the next page), in recognition of the learning from the NCPT exercise. The NCPT also helped to appraise the cross-boundary connections – which again are now set out in the draft SPD.

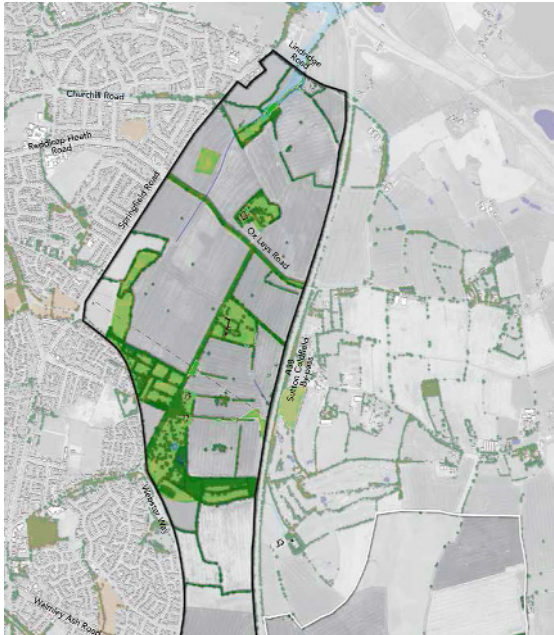


Fig. 3 Green infrastructure and assets at the Langley Sustainable Urban Extension, as set out in the draft SPD

Source: Birmingham City Council

From a broader city perspective, the learning from the case study can be seen spilling into other major developments through increased promotion of the integrated benefits of GI – addressing multiple agendas, and not drawn up in isolation from the desired outcomes from the overall vision of any scheme.

Central Bedfordshire Council used the NCPT to assess eight potential growth locations – predominantly housing developments on greenfield sites. An NCPT assessment was undertaken for all sites proposed for development where at least an initial sketch masterplan was available. The aims of the assessments were:

- To test whether the proposed growth locations were suitable for development.
- To test whether the proposed designs were acceptable.

For the first test, the focus was on the minimum/maximum possible NC performance. Less negative minimum possible scores indicate that a site has less NC (to lose) in the first place. On the other hand, higher positive maximum possible scores indicate that there is greater potential to improve NC. The NCPT outcomes indicated that, in principle, all the assessed sites were suitable for development from an NC point of view, as all sites offered opportunities for enhancement.

The impact scores were the focus of the second test. They indicate whether the proposed design would enhance or degrade NC. Here, the outcomes

were mixed, with most designs having a negative impact score at this stage, even if the sites would generally be suitable to provide a positive outcome.

Central Bedfordshire Council is using the NCPT outcomes to negotiate better designs to achieve 'additional environmental enhancement' for the proposed sites, and asked developers to improve their designs towards more positive NC creation. The council is in the process of re-assessing the updated designs with the NCPT; updated outcomes will then inform the final site allocations. The council is keen to continue mainstreaming the value of GI, and implementing the NCPT into its everyday planning practice is an important step towards this goal.

The benefits of the NCPT

Drawing on case study experiences and discussions with stakeholders and practitioners, we can identify a range of (potential) benefits of using the NCPT:

- In its recently published 25 Year Environment Plan, the government makes (on page 32) a commitment 'to put the environment at the heart of planning and development'.¹⁰ The NCPT puts 'flesh on the bones' when implementing national and local planning policies because 'what gets measured gets managed'.
- NC can be used to tackle many policy priorities, such as air quality, public health, climate change, etc., in one go. But so far, success has been difficult to measure and communicate – the NCPT makes this much easier.
- The NCPT provides a tangible basis for discussion and negotiation between planning authorities and developers/investors with respect to GI delivery. The quantitative and systematic character of the NCPT helps to clarify exactly what is expected from the developer at the earliest possible stage (outline application), which in turn has the potential to significantly speed up the planning process, benefiting both the planning authority and the developer.
- One problem often articulated by planning practitioners is that what was initially promised in terms of GI provision at the outline application stage is eroded as the planning process proceeds. With the NCPT, developers can be better held to account for delivering what was promised, since any watering down of GI investment further down the line can be objectively measured.
- New development is often opposed by local communities. The impact on the environment is seen as an important issue. The NCPT can help to generate acceptance because it provides a new means to easily communicate positive NC improvements in a tangible and transparent way.
- One can argue that, besides economic viability, development also needs to be socially and environmentally viable. The NCPT allows developers to easily communicate good practice to stakeholders,

shareholders, customers and regulators, which can give them a competitive advantage.

We believe that the NCPT will help not only to better mitigate negative effects of planning and development on the environment, but also to enable planning and development to play a more positive role in the provision and enhancement of multi-functional GI that works hard for people and wildlife alike.

Net environmental gains and the way ahead

The revised NPPF states (in para. 118) that 'Planning policies and decisions should encourage multiple benefits [...] to achieve net environmental gains'.⁴ While this is welcome, it also creates an implementation void – how can 'net environmental gains' be meaningfully operationalised? A particular challenge is measuring success – what do 'net environmental gains' look like, and how can they be measured in practice?

While the government has yet to define exactly what 'net environmental gains' means, it will likely be related to the NC performance of new development. This will require some kind of quantification system. Hence the NCPT is already well positioned to operationalise and implement 'net environmental gains'. This, in turn, would be a big step towards mainstreaming GI in the planning system, through the lens of NC, highlighting its valuable asset character.

The NCPT is a work in progress and will be updated to acknowledge any relevant policy changes such as emerging 'net gains' policies. The project team is keen to establish the NCPT as 'net environmental gains' tool. Here, we will pursue a standardised approach for implementing net gains while at the same time keeping the NCPT flexible enough to incorporate local differences and policies.

We have received a lot of feedback since the release of the NCPT and are keen to further improve this innovative tool to best suit practitioners. Our intention for the future is to make the NCPT more user-friendly, linked to policy priorities and other tools, and more flexible, to include standards for what good GI delivery looks like and encourage improvements above and beyond what is legally required and even 'minimum' net environmental gains. We believe that this will be a significant contribution towards truly mainstreaming the asset value of GI into planning policy – in the UK and possibly beyond.

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Notes

- 1 Further information about the NCPT is available from the Natural Capital Planning Tool website, at <http://ncptool.com/>. Anyone interested in trying out the tool is welcome to contact the tool developer, Oliver Hölzinger, on oliver.h.ceep@live.com
- 2 See, for example, IC Mell: 'Aligning fragmented planning structures through a green infrastructure approach to urban development in the UK and USA'. *Urban Forestry & Urban Greening*, 2014, Vol. 13 (4), 612-206. <https://doi.org/10.1016/j.ufug.2014.07.007>; and J Wilker, K Rusche and C Rymsa-Fitschen: 'Improving participation in green infrastructure planning'. *Planning Practice & Research*, 2016, Vol. 31 (3), 229-49. <https://doi.org/10.1080/02697459.2016.1158065>
- 3 See, for example, M Lennon and M Scott: 'Delivering ecosystems services via spatial planning: reviewing the possibilities and implications of a green infrastructure approach'. *Town Planning Review*, 2014, Vol. 85 (5), 563-87. doi.org/10.3828/tpr.2014.35; and A J Scott, C Carter, MR Reed, *et al.*: 'Disintegrated development at the rural-urban fringe: Re-connecting spatial planning theory and practice'. *Progress in Planning*, 2013, Vol. 83, Jul., 1-52. <https://doi.org/10.1016/j.progress.2012.09.001>
- 4 *National Planning Policy Framework*. CP 48. Ministry of Housing, Communities and Local Government, Feb. 2019 (updated version of the revised NPPF of Jul. 2018). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/779764/NPPF_Feb_2019_web.pdf
- 5 See *UK National Ecosystem Assessment: Technical Report*. UNEP-WCMC, Jan. 2011. <http://uknea.unep-wcmc.org/LinkClick.aspx?fileticket=m%2BvhAV3c9uk%3D&tabid=82>
- 6 *National Planning Policy Framework*. Department for Communities and Local Government, Mar. 2012. https://webarchive.nationalarchives.gov.uk/20180608213715tf_/https://www.gov.uk/guidance/national-planning-policy-framework
- 7 O Hölzinger, P Laughlin and N Grayson: *Planning for Sustainable Land-Use: The Natural Capital Planning Tool (NCPT) Project*. Royal Institution of Chartered Surveyors, Nov. 2015. <http://ncptool.com/Downloads/Planning%20for%20Sustainable%20Land-Use%20-%20The%20NCPT%20Project.pdf>
- 8 Further information on these and other case studies is available from the Natural Capital Planning Tool website, at <http://ncptool.com/case-studies/>
- 9 *Langley Sustainable Urban Extension. Draft Supplementary Planning Document*. Birmingham City Council, Sept. 2018. www.birminghambeheard.org.uk/economy/langley-and-peddimore-spds/
- 10 *A Green Future: Our 25 Year Plan to Improve the Environment*. HM Government, Jan. 2018. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf