

# Strategic Environmental Assessment Tool Review

## Regulatory Tools

TABLES Project 2012: Mini reviews	
<b>Task 1: Basic information</b>	
<b>Name of the tool</b>	Strategic Environmental Assessment (SEA)
<b>Type of tool (list all that apply)</b>	Regulatory, Mapping, Decision, Collaborative, Decision, Modelling.
<b>Group members</b>	<ol style="list-style-type: none"> <li>Jonathan Baker (with William Sheate and Ric Eales)</li> <li>Alister Scott</li> </ol>
<b>Please provide a brief synopsis of the tool</b>	<p>Strategic Environmental Assessment (SEA) is "the formalised, systematic and comprehensive process of evaluating the environmental effects of a policy, plan or programme and its alternatives, including the preparation of a written report on the findings of that evaluation, and using the findings in publicly accountable decision-making."</p> <p>A distinction should be made between the SEA process and the document produced (the environmental report) which documents the process and findings. SEA should be about helping find sustainable solutions to planning and development challenges and should inform the planning process to avoid, reduce or remedy adverse and to enhance beneficial effects. SEA should also inform subsequent Environmental Impact Assessments (EIA).</p> <p>Many countries have some form of SEA system and regulations requiring SEA, many of which follow the UNECE 'SEA Protocol'. In the EU Directive 2001/42/EC 'on the assessment of the effects of certain plans and programmes' (the SEA Directive) which applies to certain plans and programmes requires Member States to following main procedural stages:</p> <ol style="list-style-type: none"> <li><b>Screening</b> (does the plan or programme require SEA?)</li> <li><b>Scoping</b> (what issues should the SEA address?) – ideally with public and stakeholder consultation including requirement to consult environmental authorities.</li> <li><b>Baseline data</b> (establish the current state of the environment)</li> <li><b>Consideration of alternatives</b> (what alternative options to the plan or programme could be taken?)</li> <li><b>Mitigation</b> (what can be done to alleviate negative and enhance positive impacts of the chosen options?)</li> <li><b>Environmental Report</b> (document process and findings in a transparent way, including identification and assessment of significant effects)</li> <li><b>Public consultation</b> (consult general public, stakeholders and NGOs)</li> <li><b>Consider SEA findings and decision-making</b> (take SEA findings into account in finalising and adopting/approving the plan/programme)</li> <li><b>Monitoring</b> (monitor implementation of plan/programme)</li> </ol> <p>Other important characteristics of SEA includes its status as: a decision support tool; used to raise the profile of the environment in decision-making; must include early and effective opportunity for engagement; undertaken in parallel</p>

with the preparation of the PPP, not afterwards; focus is on significant environmental effects, including both positive and negative effects; and must consider different types of effects including cumulative effects.

The main outcome of SEA is set out in the Directive (Article 1) “to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development”.

### Task 2: Use of the tool

Position / Use	Stage	Currently used	Could be used
	Ideas	Y*	
	Survey	Y	
	Assess	Y	
	Policy / decision	Y*	
	Implement	Indirectly	
	Evaluate	Indirectly	

The stages with an asterix [\*] next to them indicate stages where there are identified failures in application. SEA which includes the legal requirements and the spirit of the Directive is involved in both the development of ideas and in shaping the policy and decision but it is accepted that there are some limitations in how this is done in practice.

SEA can inform implementation by providing advice about the specific nature of a plan or programme such as mitigation activities that could be used. Monitoring is a formal requirement of SEA and could form the basis for future evaluation.

### Task 3: Existing literature about the tool

**Are you aware of any KEY policy and / or academic literature evaluating your tool?**  
(e.g. reports, journal articles, books)

There is a huge amount of literature on SEA: see for example International Association of Impact Assessment (<http://www.iaia.org/>), Journal of Environmental Impact Assessment and Review and the Journal of Environmental Assessment Management and Policy. Plus forthcoming EC Practical guidance for integrating climate change and biodiversity into EIA / SEA procedures to which Collingwood Environmental Planning (CEP) was a key contributor. Some key references include:

CEP's Guidance on the implementation of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment

CEP - Towards a more efficient and effective use of Strategic Environmental Assessment Sustainability Appraisal in spatial planning (<http://tinyurl.com/9z9pvja>)

Collingwood, R. and Sheate, W. (2011). Opportunities missed and challenges to come? *Town and Country Planning*, 79 (3) 134-139

Collingwood, R. Baker, J. and Sheate W. (2011). Integrating a Resilience Approach into Strategic Environmental Assessment, International Association for Impact Assessment, Prague Conference, 2011

Collingwood, R. P. (2011). Effectiveness of Policy Level Environmental and Sustainability Assessment: Challenges and Lessons from Recent Practice. *Journal of Environmental Assessment and Policy* 12 (1) pages 39-65.

Collingwood, R. P., Aschemann, R., Dusik, J., Fischer, T. Partidario, M. and Verheem, R. (2011) (eds.). *Handbook of Strategic Environmental Assessment*. Earthscan: London

Collingwood, R. P. and Fischer, T.B. (2010) Reviewing the quality of strategic environmental assessment reports for English spatial plan core strategies, *Environmental Impact Assessment Review*, 30 (1)

62-69

- ischer, T. B. (2012). Identifying shortcoming in SEA practice. *Town and Country Planning*, 81 (6) 281 – 286.
- Gibson, R. B. (2006). Beyond the pillars: Sustainability Assessment as a framework for effective integration of economic and ecological consideration in significant decision-making *Environmental Assessment Policy and Management*, 8 (3), 259-280.
- Office of the Deputy Prime Minister – Practical Guide to SEA (<http://tinyurl.com/5a7363>)
- Hillips, P. and Sheate, W. R. (2010). A new SEA pathway: Reflecting on Strategic Environmental Assessment in Scotland, *The Environmentalist*, Vol. 104, 20 September 2010, 19-22. available at [www.iema.net](http://www.iema.net)
- Resource Manual to Support Application of the SEA Protocol (<http://tinyurl.com/9o82gty>)
- Herivel, R. (2009) Appropriate Assessment of Plans in England *Environmental Impact Assessment Review* 29 261-272

#### Task 4: Your experience of working on the tool

**Have you done any research/consultancy work on this tool in terms of its development, testing and/or evaluation?**  
*If so, please provide an outline.*

CEP has been involved in numerous aspects of SEA, including:

- Undertaking SEAs of plans and programmes in various sectors.
- Producing SEA guidance, including for the UK government, local authorities and the EC.
- Undertaking training and capacity building on SEA and developing distance learning courses.
- Reviewing completed SEAs and providing expert advice (for Judicial Reviews, for Government bodies, NGOs etc.).
- Undertaking research on SEA including assessment approaches and tools.
- Writing academic journal papers and book chapters.

For specific examples, see: [http://www.cep.co.uk/SEA and SA.html](http://www.cep.co.uk/SEA_and_SA.html)

Scott has helped review SEA in Scotland particularly the CNPA SEA in 2008. He has attended training courses and delivered lectures.

#### Task 5: Incorporating the ecosystem approach (EA) and ecosystem services (ES)

*\*\*Please refer to the summary text about ES for concept clarification at the end of this template (appendix)\*\**

**Using examples (from practice, research or consultancy), explain how EA and/or ES are currently incorporated in/by the tool**

*If neither approach is currently incorporated, please move to the next*

The incorporation of ES/EA into SEA is at a relatively early stage and there are limited examples where a formal ES/EA framework has been utilised. There is however a lot of interest in SEA developing in this direction with many practitioners and researchers considering that ES/EA offers significant potential to SEA and vice versa.

Examples of ES/EA inclusive SEA and guidance on this topic include:

- SEA of the Portuguese Integrated Coastal Zone Management Plan<sup>1</sup>
- South Africa eThekweni Municipality SEA methodology development
- Metropolitan Glasgow Strategic Drainage Partnership (MGSDP) Implementation Plan SEA<sup>2</sup>
- Wareham Managed Re-alignment (UK) - Green infrastructure in environmental assessment (EIA/SEA)
- OECD's Advisory Note on SEA and Ecosystem Services<sup>3</sup>

<sup>1</sup> Partidário, M. R. (2010) TEEB case: SEA for including ecosystem services in coastal management, Portugal [Online] Available from: <http://www.eea.europa.eu/atlas/teeb/sea-for-including-ecosystem-services-1>

<sup>2</sup> MGSDP (2011) *The Metropolitan Glasgow Strategic Drainage Partnership* [Online] <http://www.mgsdp.org/>

<sup>3</sup> OECD (2010) Strategic Environmental Assessment Ecosystem Services [Online] available from <http://www.oecd.org/dataoecd/24/54/41882953.pdf>  
<http://neat.ecosystemsknowledge.net>

question	<ul style="list-style-type: none"> <li>WRI - Ecosystem Services Review for Impact Assessment<sup>4</sup> More information is provided in our recently submitted paper which is attached.</li> </ul>
<p><b>How <u>could</u> the ecosystem approach and/or ecosystem services be (further) incorporated within the existing tool?</b></p>	<p>There are felt to be two broad approaches to incorporating ES/EA:</p> <ol style="list-style-type: none"> <li>1) Comprehensive ecosystem services SEA; and,</li> <li>2) Ecosystem services philosophy SEA.</li> </ol> <p>The former is marked by the more quantitative approach to ecosystem services – this may include a systematic identification of ecosystem service supply and demand across an area and may extend to the monetary valuation of ecosystem services as shown in the Wareham Managed Re-alignment and the MGSDP examples given above.</p> <p>The ecosystem services philosophy is more about the use of EA/EA as a heuristic or as a framing for the environment – see for instance the eThekweni and Portuguese SEAs. As such it is a less significant departure from existing practice and relies on a changing of language and emphasis of approach. The relative merits of these approaches are not currently clear as there are limited applied examples – however the work emerging from the case studies suggest that the ecosystem services philosophy framework is applicable to a wider range of sectors and assessment contexts.</p> <p>In effect the SEAs of all plans or programmes that rely, to a greater or lesser degree, on a high quality natural environment could draw on the ‘ecosystem services philosophy’ approach as an initial starting point. For plans or programmes that are identified via scoping as being more reliant or having a greater impact on the natural environment it may be appropriate to promote the integration of ecosystem services to the point of a comprehensive ecosystem services SEA. This can be seen with the MGDSP where scoping led to the realisation that ecosystem services and ecosystem health more widely has a large role to play in delivering the objectives of the plan. However even within comprehensive ecosystem service SEA there is a need to incorporate non ecosystem services aspects as appropriate – for example relating to heritage, deprivation and non-ecosystem services health issues.</p>

**Task 6: Situating the tool within priority questions/criteria arising from the scoping interviews**

<p><b>Explain how the tool can be situated within the priority questions/criteria that arose in the scoping interviews</b></p>	<p><b>Priority question/criteria</b></p>	<p><b>Does your tool address/implement this question/criteria?</b></p>
	<p><b>Language and communication</b></p>	
	<p>1. Contribution to aiding the development of shared vocabulary within which principles of EA and ES can be shared with multiple stakeholders across built and/or natural environment</p>	<p>SEA provides a legal and potentially transparent framework within which interactions relevant to the natural and built environment can be consistently presented and consulted upon.</p>
	<p>2. Capacity of the tool to develop shared understandings of the many identities and values of places from the perspectives of multiple visitors, residents and businesses</p>	<p>SEA requires engagement with the public and other stakeholders and to ascertain their views about the status of their local environment. There is therefore some limited scope to bring together the perspectives of various groups.</p>
<p>3. Capacity of the tool to improve or enable engagement across different publics so avoiding the usual</p>	<p>Stakeholder engagement is a core requirement of SEA (supported by the Aarhus Convention) and as such there is the potential to engage with those groups that are felt to be most</p>	

<sup>4</sup> WRI (2011) Ecosystem Services Review for Impact Assessment [Online] Available from: <http://www.wri.org/publication/ecosystem-services-review-for-impact-assessment>  
[neat.ecosystemsknowledge.net](http://neat.ecosystemsknowledge.net)

suspect problem	appropriate around the development of a plan or programme.
<b>Learning from experience/pedagogy</b>	
4. Capacity of the tool to help reveal and value 'hidden' assets that are not recognised by communities or publics that use them	The scoping stage of SEA takes the baseline information and identifies the priority issues in an area. Good SEAs should learn from previous assessments and experiences and build on this to identify environmental assets.
5. Extent to which tool is building on other tools or EA/ES progress	SEA is a meta-tool in that a wide range of other tools can operate within, in a nested fashion. As such SEA responds to developments within each of these supporting tools. One of these developments is EA/ES.
6. Extent to which tool is locally derived or grounded or can be adjusted to closely reflect 'local' context. Is the tool suitable for an open source approach?	SEA's core process is not adaptable but the exact way it is met and what information sources it uses are adapted for the local context. The baseline stage entails the collection and analysis of a significant amount of local information. (see next box for reference to open source)
7. Extent to which the tool is open to interpretation and application in a variety of forms (that reflect 'cultural' differences)	The skeleton of SEA is a legal requirement as are certain objectives and outputs, but at its simplest SEA is just a process and there is huge potential to take the basic requirements of SEA and to reconfigure how these are met. This can be seen within the different interpretation and transposition of EU Member States. For instance England and Wales' incorporation of economic and social aspects into Sustainability Appraisal (required for land-use plans) is relatively unique in the EU. Scotland, for example, focuses on just environmental topics.
<b>Developing and selecting tools</b>	
8. Is the tool dependent on a specific funding source? How onerous is the application procedure? What are the chances of success?	As SEA is a legal requirement the funding for SEA will be linked to whatever plan or programme it is supporting. A failure to undertake a compliant SEA may result in the plan being rejected. As such the funding source is not specific, but it is required. The application procedure is reasonably onerous.
9. Does skills development (essential or optional?) and support exist for the tool or is there a body to ensure the optimal and correct use of it?	SEA is a firmly established process and many hundred assessments are undertaken in the UK each year. There is therefore an existing skills base. There are also established quality assessment criteria for SEA as well as a wide range of guidance and support from various bodies. There are concerns that due to insufficient capacity responsible authorities (those who are required to do SEAs) outsource SEA to consultants. This believed to have contributed towards the separation of SEA from the plan making process.
10. Extent to which current statutory hooks can be exploited by the tool or will	SEA is a legal requirement so there is a very clear hook there. SEA's status as a meta-tool means that many hooks are potentially relevant – for

benefit the quality or application of the tool (e.g. NNPF's duty to cooperate, SUDS, ecol. networks)	example the requirement for consultation ties into the duty to cooperate. SEA also requires consideration of water, landscapes, air and climate.
<b>Informing resultant policies effectively</b>	
11. Extent to which the tool informs or improves policies/decisions. What does the tool cover? (full range of positive and negative economic, social and environment impacts / tradeoffs?)	SEA focuses on the positive and negative environment and human health impacts of a plan or programme. Sustainability Assessment (SA), which is applied to spatial plans in England and Wales and incorporate SEA, considers the full spectrum of social, economic and environmental aspects including tradeoffs. Both SEA and SA are intended to provide explicit support to decision making, although review of practice suggest that is can be seen as a hurdle to be jumped rather than as valuable support tools.
12. How does the tool link into the planning system (applications and processes). At what cost / extra burden?	SEA is formally required on all plans or programmes that meet specific criteria of the Directive. Broadly speaking SEA is required for plans or programmes likely to have a significant environmental impact and that will form the framework for Environmental Impact Assessment – which includes many plans prepared as part of the spatial planning system. The requirement for SEA is determined at the screening stage and the content is determined at the scoping stage. There are significant costs to SEA as it is an expert led process and procedural requirements; it is a legal requirement (where the Directive applies) rather than optional.
<b>Delivering management objectives</b>	
13. Suitability or capacity of the tool to assist with managing visitor needs and pressures within protected areas / the considered area? How?	SEA may provide support to plans which seek to manage visitor needs and pressures – for instance SEAs are required for National Park Plans This will be done in part by the assessment of various alternatives to a plan or programme.
<b>Local ownership/new governance</b>	
14. To what extent can the tool assist in developing statutory plans (local and management plans) and improve ownership and use by publics?	SEA is explicitly a plan support tool which allows for specific public engagement via consultation. SEA provides opportunities for public ownership but this will largely be determined by the nature of the plan or programme.
15. To what extent does/could the tool contribute to a new form of community governance in management of the environment?	As it is normally practiced there is limited scope as ‘authorities’ are the ones who are undertaking the plan. However examples such as Neighbourhood Plans (which are subject to SA) may provide an opportunity for alternative governance of the natural and built environment. SEA can also be used by third parties to seek to hold decision-makers and plan/programme proponents to account.



<b>Improved tools: understanding flows, interconnections and spatial issues</b>	
16. Capacity to improve spatial understandings of the flows and interactions of various ecosystem services between sectors and at different scales	The core analytical stages of SEA (scoping, baseline, assessment, alternatives) are all based on a comprehensive understanding of natural environmental processes. Ecosystem services are starting to be considered within these stages and has significant potential, but is at a relatively early stage of development and may not be relevant in every SEA.
17. Capacity of the tool to reconcile assessments of options and benefits across different scales (and sectors)	SEA is specifically tasked with the assessment of 'reasonable alternatives' as well as the proposed plan/programme. It is, however, limited to the scope of the plan or programme it is supporting. As such the opportunity to reconcile across different sectors and scale is limited to the nature of the plan. SEA has an explicit role in considering impacts at different scales (it considers both biodiversity and landscapes for example, and cumulative effects). It is however acknowledged that to date this is not always done well.
18. Extent to which the tool is capable or can be manipulated to work across sectoral and administrative boundaries	SEA is limited to the scope of the plan or programme it is supporting. There are however requirements to engage with relevant stakeholders, including trans-boundary. Relevant stakeholders are likely to be potentially affected organisations and this is not limited to sectoral or administrative boundaries.
19. Extent to which the tool can handle data shortages and gaps (or is effectiveness considerably compromised?)	The quality of an SEA is not determined by the quality of the data (rather the nature of the process and role with the plan or programme). Good quality data is important to provide an adequate baseline and understanding of the impacts – based on qualitative and quantitative data sources. There are mechanisms such as stakeholder engagement, using indicators or proxies etc which allow practitioners to manage data gaps. In addition SEA can use the evidence base on the plan or programme.
20. To what extent has/could the tool put landscape/nature conservation and designated species/sites on the radar (positively or resulting in resentment?)	SEA requires the consideration of landscape and biodiversity but the interpretation of these can be limited. SEA also has a role to play alongside assessment required under the Habitats and Birds Directive, and may be triggered by potential effects on designated sites. Despite this the limited use of SEA to date in being used properly as a support tool (rather than a statutory hurdle) will have limited its impact in flagging the importance of landscape/nature conservation and designated species/sites. SEA is also only an advisory tool and needs only to be taken into account.

SEA is an inherently flexible tool as it consists of a few key stages. It is therefore potentially well able to deal with a wide range of issues. Its exact ability to deal with

specific issues is largely dependent upon how it is used.

### Task 7: A SWOT analysis of the tool

Referring back to the relevant policy and academic literature (listed in Task 3), plus your own expertise (listed in Task 4) and the way in which the tool is situated within the priority questions/criteria (listed in Task 6), please complete a summary SWOT analysis ensuring that each point is well justified

#### Strengths *(of the tool in delivering intended outcomes)*

- SEA is a formal, legal process that seeks to be transparent. It therefore creates an effective space within which decision makers can consider the impact of their plan or programme on the environment in advance of its adoption/approval.
- SEA practice is relatively established and there is evidence that the quality of SEAs is improving.
- SEA requires engagement with priority stakeholders, including the public.
- SEA seeks to be evidence based and objective.

#### Weaknesses *(factors that detract from the tool's ability to deliver intended outcomes)*

- SEA is not universally viewed as a support tool to decision making and can instead be viewed and practiced as an administrative exercise. This is due in part to outsourcing of SEA to consultants who are not involved with the plan making process in the same way that authorities are. That is, SEA is not yet sufficiently integrated with plan and programme decision making, though this may be a function of its relative lack of maturity (implemented in EU formally only since 2004).
- SEA is an advisory tool and its ability to protect the environment is therefore limited (as opposed to Appropriate Assessment under the Habitats Directive which has greater powers).
- SEA is primarily an environmental tool; the practice of using SA which combines social and economic considerations has arguably led to a reduced focus on environmental protection.

#### Opportunities *(consider opportunities for application of the ecosystem approach and services)*

- ES/EA is an integrating concept which instead of dealing with discrete environmental 'topics' considers bundles of services that flow from the environment. As such it is more 'real' and may allow better consideration of cumulative impacts - an area currently poorly dealt with in SEA although required.
- With ES/EA the description of the environment moves from things to benefits and may be a more persuasive way of framing the environment in SEA.
- Stakeholders and the public are well placed to engage with this alternative description as they are potentially the 'users' of the environment.
- ES/EA may be of particular value where there are clear conflicts between traditional environmental and economic arguments within SEA and a related plan or programme.
- Incorporating ES/EA into SEA helps practitioners and decision-makers to reflect on the impact of the environment on their plan or programme rather than just vice versa.
- The ecosystem service framing makes explicit the value of the environment for decision makers.

#### Threats *(factors which negatively affect the tool and its outcomes)*

Threat of going down ecosystem services route in SEA to validity of the concept	Seriousness (high, medium, low)	Probability of occurrence (high, medium, low)
The use of ecosystem services language may not resonate with stakeholders.	Medium	Medium
The complexity of ecosystem services may add to already complex process	Medium	High



	The contested nature of ecosystem service valuation may not be robust enough for EA which operates within a legal framework.	Low	Medium
	Doing more comprehensive ecosystem services assessment is potentially very resource intensive	High	High
	Ecosystem services may not be relevant to all plans or programmes or all institutional contexts	Low	High
	Mitigation and offsetting are more complex than previously; there is also a risk that ecosystem service mitigation may not be compliant.	Medium	Low
	Ecosystem services is not be uniformly relevant to all the topics that SEA is required to consider – for example ‘material assets’ and ‘air’.	High	High
	Valuation of ecosystem services does not necessarily fit with how decisions are made about spatial planning – which is much more about balancing a wide range of factors, not a cost, benefit calculation.	Medium	Low
<b>Further comments</b>			


## Appendix 1: Visual Representation of Comprehensive Ecosystem Services Assessment and Ecosystem Services Philosophy

### The ecosystem-service philosophy

Traditionally SEA focuses on describing the environment as a ‘thing’, something to include as part of the baseline inventory. The ecosystem-service philosophy seeks to develop this description: from things, to benefits and uses.

This is shown in the Figure below which demonstrates these three terminologies and their differences. Using this approach provides a framework that shows how and why the environment matters and has a language which complements traditional terminology. The ‘benefits’ language allows for effective description about the role of the environment in supporting policy when the audience is policy makers. The ‘uses’ language can be used when talking to members of the public and community and is an effective way to promote knowledge exchange between the SEA process and the public, for instance identifying priority services or areas based on how people are using the environment.

Benefits and uses avoids the problem of ‘ecosystem-services’ and related terminology which is quite technical and esoteric.



Things	Benefits	Uses
Area of Beech ( <i>Fagus sylvatica</i> ) dominated wood parkland	Area that provides benefits to society, namely: <ul style="list-style-type: none"> <li>• Food production;</li> <li>• Cultural and spiritual;</li> <li>• Carbon sequestration and storage;</li> <li>• Water and flood regulation;</li> <li>• Soil formation;</li> <li>• Noise reduction;</li> <li>• Ornamental resources;</li> <li>• Biological control;</li> <li>• Pollination.</li> </ul>	Area that can be used in a variety of ways, namely: <ul style="list-style-type: none"> <li>• Walk the dog;</li> <li>• Get ivy for Christmas;</li> <li>• Build a jump for bike;</li> <li>• Go for a stroll;</li> <li>• Gets flooded in the winter;</li> <li>• Get some peace and quiet;</li> <li>• Harvest nuts and mushrooms;</li> <li>• To meet as part of a community group.</li> </ul>

Examples of this can be seen in the THESAURUS work - see: <http://www.cep.co.uk/Thesaurus.html> and Sheate, W.R., Eales, R.P., Daly, E., Baker, J., Murdoch, A., Hill, C., Ojike, U., and Karpouzoglou, T., (in press) Spatial Representation and Specification of Ecosystem Services: a Methodology Using Land Use/Land Cover Data and Stakeholder Engagement. Journal of Environmental Policy Assessment and Management Vol:14, Pages:1-36.

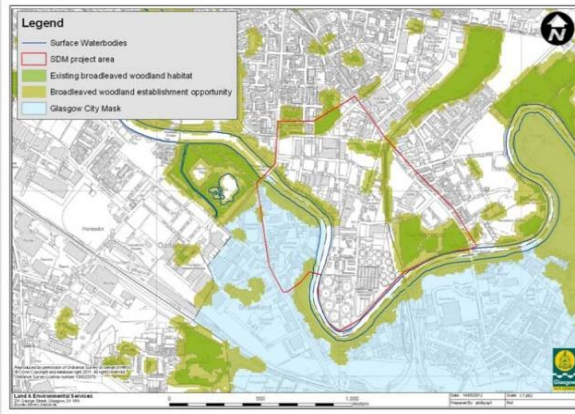
### Comprehensive Ecosystem Assessment

This use of ecosystem services within SEA may, or may not, include the use of economic valuation of ecosystem services. Regardless it builds on the ecosystem services philosophy and involves a much more detailed analysis of the type and nature of ecosystem services being provided within the scope of a plan or programme and assessing their contribution to supporting the plan or programme. An example, of non monetary valuation, is the Metropolitan Glasgow Strategic Drainage Partnership (MGSDP) Implementation Plan SEA.

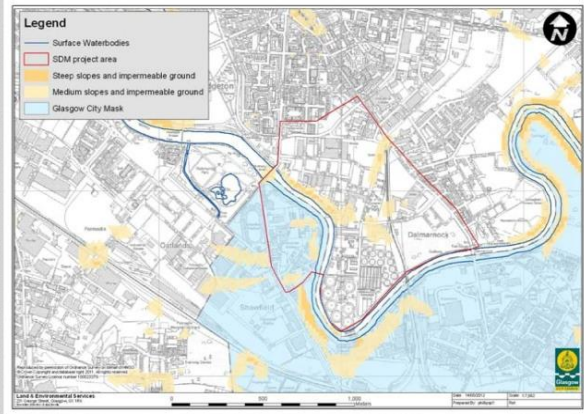
The successful delivery of the Implementation Plan was felt to be reliant on healthy, functioning ecosystems as well as the direct provision of water management related ecosystem services. Accordingly, understanding where the natural environment is providing these ecosystem services as well as areas where there might be a shortfall of these services is a key issue for both the SEA and plan-development. As part of the SEA process, a Green Infrastructure Masterplan will be developed for the region using Geographic Information System (GIS) based modelling.<sup>5</sup> This GIS work is based on a network analysis linking land use to ecosystem services and will be used when considering the various ways that the plan or programme may seek to meet its objectives.

<sup>5</sup> Explanation of the Figure - Focusing on the South Dalmarnock area of Glasgow's east end, the figure above shows outputs from several stages of the GIS modelling undertaken to inform the identification of opportunity areas in the MGSDP's Green Infrastructure Masterplan. Map 1 shows patches of existing broadleaved woodland habitat as well as land with high ecological potential to support the further establishment of this habitat. Maps 2 and 3 show areas of 'steeply' sloped and 'medium' sloped ground within the immediate catchment of large areas of impermeable ground and surface waterbodies respectively. Precipitation falling at these locations is likely to drain quickly to the nearby area of impermeable ground or surface waterbody contributing to increased pressure on the underground drainage network or increased streamflow.

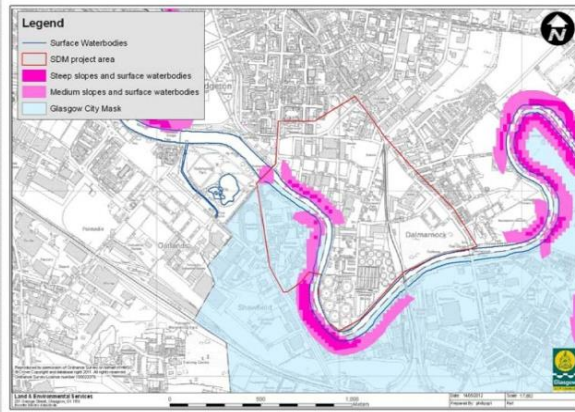
### 1. Broadleaved woodland habitat establishment areas



### 2. Hydrological cycle restoration areas (impermeable ground)



### 3. Hydrological cycle restoration areas (surface waterbodies)



### 4. Combined green infrastructure opportunity areas

