



The promotion of environmental enhancement in Strategic Environmental Assessment

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ABSTRACT

This paper evaluates how the *enhancement* of positive environmental impacts has been considered and developed in Strategic Environmental Assessment (SEA) reports since the SEA Act in Scotland was introduced in 2005. Fifteen Environmental Reports on strategic actions prepared between 2006 and 2009 were scrutinized for this study, one of which pertained to national policy and the rest to responsible authority programmes, plans or strategies throughout Scotland. A four point scale was developed to evaluate the extent to which environmental enhancement promotion or measures were considered in the Environmental Reports: Thorough, Fair, Minimal and Absent. Results found that nine out of the 15 Environmental Reports studied were graded as 'minimal' or 'absent'. The paper concludes that in order for SEA to achieve its full potential, in addition to considering mitigation measures for negative environmental impacts, SEA practitioners and decision makers must begin to realize and exploit potential enhancement opportunities.

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1. Introduction

This paper analyzes how environmental enhancement promotion is being integrated into the Strategic Environmental Assessment (SEA) process in Scotland and, by extension, the role SEA plays in ensuring that environmental enhancement measures are being identified for incorporation into strategic actions. Environmental enhancement of positive impacts, particularly in the context of biodiversity and habitat loss, represents one of the main objectives of sustainable development (see for example CBD, 2002), and SEA is recognized as a potential instrument for promoting its delivery through public body policies, plans and programmes (strategic actions) (Fuller 2004; ODPM, 2005; Therivel 2004).

However, SEAs have been found to focus mainly on *mitigation* and frequently ignore the opportunity offered by *enhancement* measures. For example, an SEA of a Scottish Local Plan carried out in September 2005 categorized all proposals into three categories: A – likely to have

a significant environmental effect; B – may have a significant environmental effect, and C – unlikely to have a significant environmental effect. The Environmental Report then stated that proposals falling under category C, the category that included sites where environmental effects were likely to be positive, would *not* be considered further in SEA (João and McLauchlan 2005). This issue has also been raised by Ng and Obbard (2005, p. 483):

...the application of SEA in Hong Kong continues to have notable limitations. SEA needs to evolve beyond its current sectoral application to examine ways in which development decisions can not only pre-empt and prevent environmental damage, but also positively enhance and restore existing natural resources. Current land use plans and transportation strategies still largely determine the pattern of development in the near future without adequate longer-term environmental cost-benefit analysis.

This paper explores the extent to which potential environmental enhancement measures have been developed and positive environmental impacts relating to strategic actions have been identified, enhanced and promoted through the SEA process in Scotland. Scotland transposed the European SEA Directive 2001/42/EC into Scottish Law first as The Environmental Assessment of Plans and Programme (Scotland) Regulations 2004, and then as the Environmental Assessment

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(Scotland) Act (2005) (hereafter referred to as the SEA Act), with the number of strategic actions being subject to SEA rising from 25 in 2005 to 111 in 2008 (Scottish Government 2009a).

Scotland represents an interesting national case study as the Scottish Government committed, through the SEA Act, to extend the requirement of the SEA Directive – which only requires that *certain* plans and programmes be exposed to the SEA process – to include *all* plans, programmes and strategies being taken forward by the public sector or responsible authorities preparing strategic actions with a public character (with a few exemptions such as budgets). This decision was in accordance with the Scottish Government's commitment to integrating the principles of sustainable development into Scottish policy (Scottish Government 2005) and its ambition to become a “world leader” in SEA (SEEG, Scottish Executive Environment Group 2004).

In order to introduce the context of the analysis of this paper, some examples of how SEA can contribute to environmental enhancement and how it relates to sustainable development are introduced. The method used to select and evaluate the 15 Environmental Reports with regard to environmental enhancement is thereafter presented and the results and analysis are then discussed in the context of the SEA Act and guidance on SEA for practitioners. The paper concludes by offering some recommendations for SEA policy and practice, as well as some suggestions for future research.

2. Sustainable development, SEA and environmental enhancement

The agricultural, industrial and technological revolutions have heralded important reforms in education, health, working conditions and standards of living for many modern developed societies. However, increasing recognition of the associated environmental costs of certain kinds of development, including natural resource exploitation, pollution and habitat/biodiversity loss as well as global climate change, has led to the development of the concept of sustainable development, which broadly aims to “enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life of future generations” (SDC, 2010).

One of the four shared priorities of the United Kingdom Sustainable Development Strategy is “Natural Resource Protection and Environmental Enhancement”, with the need for a more integrated policy framework being put forward as a requirement to deliver it (DEFRA 2005 p.96). Accordingly, the Scottish Government (2009b) recognizes that a main objective of sustainable development is to reduce, mitigate or reverse any environmental degradation associated with development – e.g. in transport, planning or waste management – through the deployment of policy instruments such as SEA. SEA is a policy instrument which has been developed since the 1980s as a means to influence strategic decision making in policies, plans or programmes (PPS or strategic actions) of public bodies (Bina 2007) or responsible authorities undertaking PPS of a public character – although it can also be argued that SEA (like EIA) started with NEPA (National Environmental Policy Act) in 1969 in the USA (Partidário 1999).

The principal aims of the SEA process are as follows: to help decision makers integrate environmental and sustainability considerations into strategic actions; to enhance environmental protection; to promote public participation in the decision-making process; and to increase government and local authority transparency (Nilsson and Dalkmann 2001; Partidário 1999; Therivel 2004). In addition to these aims, one of the functions of the SEA process is to identify positive environmental impacts of a strategic action and enhance them (Fuller 2004; ODP, 2005; Therivel 2004), which may refer to enhancing for example biodiversity, ecosystems (as well as soils, water or air), landscape character, green spaces and cultural or historical heritage.

Early critics on the effectiveness of SEA argued that it could be used as a tool for offsetting (or compensating) environmental degradation with enhancement measures and that it only serves to displace and

defer the conflict between economic development and the environment (Horton and Memon 1997). In contrast, one of the generally agreed upon principles of SEA is that it should be a tool for improving a strategic action through providing viable strategic alternatives, mitigation of negative impacts or enhancement of positive impacts (see for example Hales 2000 p. 99–121; João 2005 p. 3–14; Therivel 2004 p. 7–9). This notion highlights the importance of environmental enhancement opportunities being brought to the decision-makers' attention as a result of the SEA process. This should be in addition to the consideration of options or alternatives to mitigate negative consequences of development. Also, Therivel (2004), one of the leading advisors on the SEA process in the UK, argues that after the impact prediction and evaluation stages of the SEA process, the impact mitigation stage should include a list of measures aimed at optimizing positive impacts and enhancing sustainability within the assessed and other strategic actions, and/or set a context for future projects (p. 167).

In spite of these principles, the Scottish SEA Act fails to stipulate any obligation to consider or include environmental enhancement or improvement and only states that the report must list ‘the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme’ (Environmental Assessment (Scotland) Act (2005), schedule 3, par. 7). There is some provision for enhancement in the UK Environment Act 1995, which states that it should be the principal aim of the [Scottish Environment Protection] Agency (SEPA) to protect or enhance the environment in the discharging of its duties (Environment Act 1995 (c. 25); The Environment Agency and the Scottish Environment Protection Agency, ch.1, s.4); and to “further the conservation and enhancement of natural beauty and the conservation of flora, fauna and geological or physiographical features of special interest” as per regulation 7. In this sense, SEPA is obliged as statutory consultees in the SEA process to encourage environmental enhancement.

Following the introduction of the SEA Act, in 2006 the Scottish Government published a toolkit including guidance to assist local authorities in the application of the SEA process and to comply with the Act (Scottish Government 2006a). In accordance, the guidelines state that only ‘measures envisaged for the prevention, reduction and offsetting of significant adverse effects’ be listed in the Environmental Report (Scottish Government, 2006a p. 21). Although the SEA template provided by the Scottish Government (2006b) includes a method for recording positive environmental effects, no reference is made in the accompanying guidelines as to how the SEA practitioner should process these effects. As such, the SEA Act only requires environmental enhancement to occur as an offsetting measure and that it need not necessarily be implemented to such a degree as to be regarded as inversely equivalent to that of the negative environmental impact occurring as a result of the strategic action. However, the guidelines do suggest that ‘it may be useful [to indicate] how positive environmental effects may be enhanced’ in the Environmental Report (Scottish Government 2006b p. 21).

The SEA Act and the respective SEA guidelines may therefore be regarded as failing to exploit the opportunity to enhance the environment or reverse environmental degradation in line with the Scottish Government's ambition to become an ‘exemplar of sustainable development’ (Scottish Government 2005). This view supports the findings of McLauchlan and João (2005), who argue that a system to monitor and audit the quality of environmental reporting and implementation of SEA is required to support the Scottish Government's ambition to become a ‘world leader in SEA’, proposing that a central access point be developed where guidance and templates on SEA practice can be obtained by practitioners as well as examples of good practice.

Other guidance that is specific to particular development sectors or sustainability issues is available along with case studies and examples of good practice from various sources (see for example TRL, 2004, SEA-info.net 2009, English Heritage 2010). In terms of biodiversity enhancement, the Royal Society for the Protection of Birds (RSPB) published SEA

Table 1
How environmental enhancement can be integrated into the various stages of SEA in the ER.

SEA Stage	Environmental enhancement potential
Objectives	An example of a strategic objective with a strong emphasis on environmental enhancement might be 'to ensure the conservation and enhancement of biodiversity, flora and fauna', while a weak objective on enhancement might be 'to minimize the impact on biodiversity,' which fails to promote environmental enhancement.
Baseline information	Before environmental enhancement opportunities can be identified and prioritized, it is essential that appropriate and sufficient data (e.g. biodiversity, habitat types, flora and fauna, protected sites, green spaces, cultural heritage) be collected and presented in the context of the strategic action. Might need to collect data not only 'what is there', but also 'what used to be there' or 'what is possible to be there'. Where possible, 'least-cost' enhancement measures for specific habitats or areas can be established through consultation with the appropriate bodies, consultants or custodians of baseline data.
Relevance and implications to other strategic actions/policies	There are many other national, regional and local strategic actions or policies to which any strategic action has relevance, some of which encourage environmental enhancement such as the UK and Local Biodiversity Action Plans (LBAP) or the 'Scotland's Biodiversity: It's in Your Hands' document (a strategy for the conservation and enhancement of biodiversity in Scotland – Scottish Executive, 2004) or the UK Sustainable Development Strategy (DEFRA, 2005). Effective SEA identifies the relationship between the strategic action being assessed and other strategic actions and tries to develop it in respect of them (Therivel 2004), which in the above mentioned examples would imply integrating environmental enhancement measures where possible.
Alternatives	This is perhaps the most important opportunity for the SEA practitioner to integrate environmental enhancement measures into the proposed strategic action (see e.g. Steinemann 1999, Therivel 2004). As the SEA process is required to be carried out during the development of the strategic action, a range of alternatives can be disseminated and tested against SEA issues and objectives of other strategic actions as well as the sub-objectives of the strategic action itself. The alternatives should be reasonable and practicable, i.e. they should not be employed to display the merits of any particular predetermined alternative. It is at this stage that the limits of how much environmental enhancement or impact mitigation can be realized without over-compromising other objectives – such as economic growth, social interests or access – with a view to achieving sustainable development. It is at this stage that consultation should be sought from guidance and relevant experts to identify specific environmental enhancement opportunities in respect of the strategic action.
Identification and evaluation of key effects	At this stage the main effects of the various strategic action alternatives or the main effects overall of the strategic action are presented. These should also include the positive effects as well as the secondary or cumulative effects of the strategic action, and the consideration of long term effects is required in order to reveal any potential positive effects of measures such as habitat creation or the establishment of rules for specific development projects. This stage is crucial in that it identifies the main positive environmental effects which can be actively enhanced through implementation of the strategic action.
Mitigation and monitoring of effects (including enhancement of positive effects)	This stage is as important as the alternatives stage in terms of promoting environmental enhancement measures for integration into a strategic action. It is where general enhancement driven rules are established (e.g. that land allocations for development be based on potential for enhancement) and more specific measures (e.g. that a wildlife corridor be incorporated into a specific development site or housing strategy) can be presented in relation to the strategic action. More innovative measures will combine mitigation with enhancement; for instance, to mitigate noise pollution and visual disturbance from a proposed industrial installation, a buffer zone of native woodland might be planted around the site. This stage also includes details of how the impacts of the strategic action are to be monitored in time and how and when future baseline data will be presented. Environmental enhancement targets may be set in relation to the baseline data, such as a timeline for the full development of a particular habitat such as a woodland area. Perhaps most importantly, a robust monitoring regime must be developed to ensure that all mitigation and enhancement measures are effectively implemented in time and not just given lip-service.
Consultation and decision making	At this stage the Environmental Report and a draft version of the strategic action are published and made available to the public and statutory consultees (Scottish Environmental Protection Agency, Scottish Natural Heritage and Historic Scotland, as well as the Scottish ministers where appropriate) for responses. It is at this stage that statutory consultees and the wider stakeholder groups, such as the RSPB, can potentially recommend further environmental enhancement measures, which can be adopted (or otherwise) into the strategic action.

guidance for practitioners aimed at ensuring that biodiversity considerations are appropriately addressed (RSPB, 2004). The guidance recognizes the potential of various mechanisms within SEA to protect and enhance biodiversity ranging from specialist consultation input to the requirement of a monitoring regime for the strategic action. More directly, the guidance provides set SEA objectives which, in addition to the objective that biodiversity enhancement be incorporated to compensate for unavoidable loss, include the objective that opportunities for enhancing biodiversity be sought wherever possible and that opportunities be taken to remediate contaminated or degraded land. These objectives are listed with associated possible mechanisms for achieving them and are linked to relevant legislation/policy. A toolkit is also provided for the SEA practitioner, which provides step by step guidance on how biodiversity considerations can be integrated into the SEA process at each stage.

English Heritage (2010) also recently published guidance for SEA/Sustainability Appraisal (SEA with a broader scope integrating economic and social issues). The guidance focuses on how the conservation and enhancement of heritage assets and the historic environment should represent a principle objective in the SEA/SA process. The guidance highlights that compensation measures are not usually appropriate as historic assets are irreplaceable, but that mitigation measures should seek to enhance the historic environment.

In terms of specific environmental enhancement measures, an example of how they can be realized and implemented through the

SEA/SA process comes from the Lower Derwent flood risk management strategy developed by the UK Environment Agency. An enhancement section in the adopted strategy (Environment Agency, 2010) states, "Wherever possible, we will take every opportunity to integrate environmental enhancements into the design of the preferred option. These enhancements could include:

- Creative urban landscape design to improve the visual quality of the area;
- New or improved footpaths and cycleways;
- Enhancement of Biodiversity Action Plan priority habitats;
- Floodplain restoration recreating natural channel processes;
- Modification of weirs to allow fish migration; and
- Use of public art."

Although the SEA Act prescribes what must be included in the Environmental Report, it does not stipulate that any particular guidelines have to be followed. As such, SEA practitioners are free to draw from any guidance available to them, as long as the minimum requirements of the SEA Act are met. The next section explains the method used to achieve the objective of this paper: to analyze SEA practice in Scotland to assess the extent to which environmental enhancement promotion is being incorporated into the SEA process.

Box 1

Grades used to evaluate the extent to which the environmental enhancement promotion or measures are developed throughout the Environmental Report.

Absent (*) – This grade indicates that the ER failed to effectively integrate environmental enhancement into any of the SEA stages. The grade also applied to those ERs where one or two occurrences of the term may have appeared, e.g. in relation to other strategic actions, but no reference was made as to how any of these acknowledgments relate specifically to the strategic action.

Minimal (**) – This grade indicates that the ER failed to incorporate environmental enhancement promotion to any significant degree into the more potentially strategic action-altering stages of the SEA process. For example, the ER may acknowledge environmental enhancement measures listed in other strategic actions and may even have listed environmental enhancement as an SEA objective, but it would fail to address the significance of these in terms of integrating new measures into the strategic action. There would also be no, or very little, development of environmental enhancement promotion in the reasonable alternatives, or as specifically recognized positive environmental effects with respective enhancement recommendations.

Fair (***) – This grade indicates that the ER promotes environmental enhancement through some of the SEA stages, including through either the working presentation of reasonable alternatives, or direct measures being recommended for integration as a result of the identification and enhancement of positive environmental impacts, along with a dedicated monitoring of effects in respect of these.

Thorough (****) – This grade indicates that the ER significantly integrates further environmental enhancement measures through various stages of the SEA process from related policy and associated integration measures to viable strategic alternatives for the strategic action with a strong emphasis on further environmental enhancement. It may also include general and/or more specific recommendations as to how positive effects may be enhanced, with appropriate monitoring and indicators.

3. Method for evaluating enhancement in SEA

The analysis carried out for this study focused on the Environmental Reports (ER) of 15 strategic actions pertaining to various local authorities throughout Scotland and one national policy. The ERs were all prepared between 2006 and 2009 and represent the first SEA Reports fully completed following the introduction of the SEA Act in 2005. These ERs were all the ones that were readily accessible from the Scottish Government (making up just under half of all the reports carried out in this time period that had a Post Adoption Statement completed). They relate to a broad range of strategic actions ranging from Transport Plans to Biodiversity Action Plans. As such, the strategic actions have varying potential for the consideration of environmental enhancement opportunities or promotion. However, the focus of this study was on the extent to which environmental enhancement has been *recognized* through the various stages of the SEA process (see Table 1), as opposed to the extent to which it was adopted into the strategic action itself.

For instance, Biodiversity Action Plans are largely enhancement focused i.e. they consist mainly of positive effects. The SEA process in this case can encourage the further enhancement of these positive effects and highlight enhancement in other areas through input from the statutory consultees (especially in relation to the enhancement of cultural/historical resources, landscape and pollution control – issues which the ecologist drafting the Plan may be less familiar with) as well as through revisiting the already proposed measures designed to enhance the environment. For example, environmental enhancement in an SEA of supplementary planning guidance may be broader and more policy based while for a transport plan the consideration of more project-level environmental enhancement measures might be expected to feature more prominently throughout the ER (e.g. measures such as biodiversity enhancement along roadside verges or Sustainable Urban Drainage Systems (SuDS)¹).

In the context of biodiversity, environmental enhancement refers to any action or stipulation which serves to directly or indirectly result in an overall increase in biodiversity or habitat in terms of quality and/

or extent over time. An example of environmental enhancement in the case of guidance on renewable energy policy may be where the policy recommends that windfarms be constructed on land of relatively low ecological value – e.g. land that was previously used for monocultural commercial forestry with very little biodiversity – and that the development include the ecological restoration of the site to a grassland ecology managed to promote vulnerable flora and fauna suited to the prevailing habitat, both during the construction and operation of the site and after decommissioning.

With regard to assessing the relevance and implications to other strategic actions/policies of the PPS being SEA'd, the analysis recorded the recognition of policies within which enhancement is specified; from e.g. Article 151 of the Maastricht Treaty (1993) – which stipulates the preservation and enhancement of cultural heritage of European significance – to local Biodiversity Action Plans to (the soon to be replaced) Scottish Planning Policy SPP 23: Planning and the Historic Environment, which stipulated the enhancement of the character of conservation areas, gardens and designed landscapes.

In terms of environmental enhancement promotion within the reasonable alternatives section, more direct measures may include recommendations to develop rules governing consents for project-level actions, while more strategic actions may refer to recommendations or stipulation that lower level PPS take into account any potential to enhance the environment through the subsequent PPS. The SEA practitioner can also develop (in consultation with the team developing the PPS) more innovative opportunities to combine both mitigation and enhancement measures, e.g. in the creation of SuDS to process runoff from a road, or the linking of woodland fragments to mitigate flooding and promote climate change adaptation within ecotones.

Effective monitoring ensures that mitigation measures are developed beyond the SEA process. This stage also represents an opportunity for SEA practitioners to encourage decision makers to ensure that enhancement measures are also thoroughly implemented throughout the delivery of the strategic action. It should be noted however that it is also the responsibility of the statutory consultees in their assessment of environmental effects throughout the SEA process to promote enhancement opportunities. Furthermore, it is at the responsible authority's discretion whether any measures recommended throughout the SEA process are adopted into the final PPS.

The 15 SEA Environmental Reports (ERs) analyzed for the assessment were grouped into the following eight categories: Biodiversity,

¹ Sustainable Urban Drainage Systems or SuDS: where waste water is allowed to filter and seep through an engineered wetland area, which not only reduces the amount of waste water going to the local sewage plant, but creates a local wetland habitat for various flora and fauna.

Table 2
Evaluation of environmental enhancement measures in 15 Environmental Reports in Scotland (2006–2009).

Environmental Report (# = Scottish Guidance used)	Environmental enhancement promotion in the Environmental Report [Grade – see Box 1]
<i>Biodiversity</i>	
1. Orkney Islands Council's Local Biodiversity Action Plan (OLBAP) (February 2008)#	The consideration of alternatives section is very short and does not seem to have been integrated into the decision-making process for the new plan. The OLBAP's main function is to conserve and enhance the environment, but the SEA process fails to recognize any potential to <i>further</i> enhance this function. The ER identifies two environmental problems but does not consider positive effects. [Grade *]
2. South Ayrshire Council's Local Biodiversity Action Plan (ALBAP) (June 2008)# (adapted)	The ALBAP's main function is to conserve and enhance the environment, but no suggestions are made as to how such conservation/enhancement measures may be maximized, prioritized or improved upon. One enhancement measure is suggested to raise people's awareness of biodiversity, flora and fauna. The consideration of alternatives section is very short and does not indicate that it has been integrated into the decision-making process for the new plan. [Grade **]
<i>Forestry</i>	
3. Forestry Commission for Scotland's Scottish Forestry Strategy (SFS) (February 2006)	The ER affirms that supporting the integration of the SEA objective of enhancement will achieve wider benefits and that in relation to environmental objectives and other strategic actions a more proactive approach to environmental protection and enhancement is required. A key 'high level' objective is that Scottish Forestry should enhance Scotland's environmental quality and natural heritage as well as education on environmental enhancement for the public. Potential scenarios and reasonable alternatives for future plan changes are developed to ensure the highest level of mitigation/enhancement. A separate section outlines specific measures on how the SFS may incorporate more environmental enhancement for human well being and through climate change adaptation measures. [Grade ****]
<i>General development</i>	
4. Finalized Replacement Midlothian Council Local Plan (MLP) (June 2006)# (states that Guidance was adhered to)	The ER lists the enhancement of the quality of the natural heritage as one of the Plan's main objectives and lists potential sites where the water environment, conservation areas, and the area's environmental heritage may be enhanced. However, the environmental objective for flora and fauna is only in the context of conservation and mitigation and not enhancement. Alternative sites considered are tested for environmental mitigation but not enhancement. [Grade **]
<i>Paths and access</i>	
5. City of Edinburgh Council's Core Paths (ECP)(September 2007)	The ER lists the enhancement of Edinburgh's natural heritage as one of the SEA objectives. In relation to the UK BAP, this has emphasis on biodiversity conservation, but not specifically enhancement. The appraisal of the core paths recognized that opportunities to enhance the value of existing designations should be considered. [Grade **]
6. Fife Council's Access Strategy Review (FASR) 2006–2016 (August 2007)	The ER identifies the enhancement of biodiversity as a key theme in relation to the Scottish Forestry Strategy. It lists the maintenance and enhancement of biodiversity, flora, and fauna as a headline objective and the conservation and enhancement of natural/semi-natural habitats as a sub-objective. The ER identifies good access planning as potential to enhance biodiversity resources and specifically recommends that text be added to the Review to emphasize a stronger commitment to enhancing biodiversity. The alternative considered is limited to the previous plan, but alternative priorities are balanced against the SEA objectives. [Grade ***]
<i>Planning guidance</i>	
7. Aberdeenshire Council's Supplementary Planning Guidance(SPG): Carbon Neutrality in New Developments (November 2007)#	The alternative recommended in the ER is to use the Scottish Planning Policy 6 (SPP6) driven approach to development policy for the region, which infers indirect enhancement measures in terms of energy efficiency and climate change. The ER lists the protection, maintenance and enhancement of biodiversity, wildlife and natural habitats as a key point to be considered in the development of the SPG, but specific measures are not given. [Grade **]

8. Scottish Government's West Edinburgh Planning Framework (WEPF) (April 2009)	The ER includes an environmental best practice alternative (scenario 3) which is strong on enhancement measures and includes the creation of enhanced habitats within new developments and the promotion of wildlife corridors between developments. A Conservation Management Plan recommended a site with a view to enhancing the landscape as well as a sustainable development framework for another to ensure enhancement of the water environment. [Grade ****]
<i>Renewable energy</i>	
9. Fife Council's Supplementary Planning Guidance – Wind Energy and other Renewable Energy Technologies (March 2007)	No alternatives are considered. Thorough reference is made to environmental enhancement measures in other policy as relating to the Planning Guidance. No indication is given as to whether or how enhancement measures should be incorporated into the planning guidance. [Grade **]
10. Orkney Islands Council's Supplementary Guidance (SG) – Onshore Wind Energy Development (November 2008)#	ER concentrates on alternatives with one of the tests being whether the alternative improves the environment. It also relates the SG to other local, national and European policy, some of which stipulates enhancing biodiversity and habitats where appropriate. Only one alternative (predetermined preferred option) has positive environmental effects. Any enhancement is limited to site restoration <i>after</i> decommissioning. [Grade **]
<i>Transport</i>	
11. East Renfrewshire Council's Local Transport Strategy (LTS) (June 2007)	Environmental enhancement is listed as an SEA objective with the indicator of this objective being the area of priority habitat lost or created and the number of trees planted. A specific recommendation is that 'opportunities should be identified where biodiversity may be enhanced or integrated into scheme designs through habitat creation.' Alternatives are thoroughly developed with the recommended option detailing a specific integrated modal and spatial strategy with a view to reducing the extent of transport infrastructure and increasing the amount of land available for habitat creation. [Grade ****]
12. Highlands and Islands Transport Partnership (HITRANS) Regional Transport Strategy (October 2006)	The draft ER identifies via other policies the enhancement or improvement of biological diversity, aquatic systems and air quality as considerations for the Transport Strategy. One of the obligations highlighted is that it be 'consistent with the principle of sustainable development and to conserve and enhance the environment'. However, the mitigation and enhancement measures recommended place no emphasis on enhancing the environment, except as an off-setting measure of last resort. [Grade **]
13. North Ayrshire Council's Local Transport Strategy (October 2007)	The ER lists the enhancement of environmental protection as one of its main aims and to enhance biodiversity, water and air quality <i>where appropriate</i> as objectives. The ER lists as a target to actively involve Local Biodiversity Action Plan (LBAP) partners, conduct monitoring programmes and devise management strategies in the maintenance and enhancement of certain affected habitat types. Habitat creation is specifically recommended, but as an offset measure for habitat loss elsewhere. Other measures include the promotion of biodiversity including grass verge management and the planting of native species, wildlife corridor establishment and specific species promotion (Appendix D (alternatives) states that such a management regime was, however, rejected) [Grade ***]
14. Shetland Islands Council's Regional Transport Strategy (SRTS) (November 2006)	The ER lists the enhancement of environmental protection as one of the purposes of the ER and to 'protect, maintain and enhance biodiversity' as an SEA objective. Environmental enhancement measures in other policies are listed and their relation or relevance to the SRTS are commented upon but there is a lack of new enhancement measures explored through the alternatives and most measures quoted are in the pre-existing SRTS. [Grade **]
<i>Waste</i>	
15. Lothian and Borders Local Authorities' Area Waste Plan (LBAWP) (July 2007)#	The environmental objectives include 'manage waste in a way that protects and enhances biodiversity'. The ER lists the enhancement of positive effects as potentially being integral to the process of SEA. Specific enhancement measures are given and specific links are identified to the respective LBAPs of each authority. The ER develops a range of alternatives which are tested against SEA objectives including the enhancement of biodiversity. [Grade ****]

Forestry, General Development, Paths and Access, Planning Guidance, Renewable Energy, Transport and Waste. In this way the inclusion, or otherwise, of environmental enhancement promotion in the ERs could be evaluated within the context of the type of strategic actions to which they apply. Table 1 provides an overview of how enhancement measures can be integrated into the various stages of the SEA process represented in the ERs.

For each stage, any reference to environmental enhancement – which included related terms such as improved conservation or development of vulnerable or native species or habitats, as well as terms such as extending conservation measures, improving ecology, or enhancing natural heritage – was noted and contributed toward the final grade given to the ER. The results of the assessment of the ERs are represented by four grades depending on the extent to which the environmental enhancement promotion or measures are developed throughout the ER (see Box 1).

The qualitative approach of using four separate classes/grades was deemed most suitable as the approach was developed as an iterative process following the repetition of the analysis with fewer and more grades. A more quantitative approach for the assessment was also considered, such as counting the occurrences of ‘environmental enhancement’ related remarks. This approach was however rejected to avoid producing any misleading results because the context of each environmental enhancement remark varies widely, ranging from occurring frequently within other strategic actions relevant to the strategic action being assessed to forming part of a direct project-level enhancement measure relating to the strategic action. In other cases, the strategic actions to which the assessed ERs relate are primarily focused on enhancing the environment, i.e. Local Biodiversity Action Plans, in which case the occurrence of enhancement measures related more to what the strategic action was focused on than to recommendations or further enhancement alternatives resulting from the assessment.

4. The promotion of enhancement in 15 Scottish SEA Reports

Table 2 presents a summary of the results of the analysis and a brief note outlining some of the main points justifying the grade. Results of the assessment of the Environmental Reports with regard to enhancement are variable with nine of 15 being graded as *minimal* or *absent*. In addition, of the six Environmental Reports identified as having been prepared using the Scottish Government template/guidelines, one was graded *absent* and four were graded *minimal*.

Table 3 summarizes the overall performance of the ERs in respect of promotion and integration of environmental enhancement measures and it indicates more specifically how many ERs of each grade were drafted using Scottish Government guidelines. The results indicate that where the Scottish Government template/guidelines are used in the preparation of the SEA Reports, the integration of environmental enhancement promotion throughout the various stages of the Report is minimal in most cases.

For many of the poorer performing Environmental Reports the relevance of the strategic action to environmental enhancement measures in other policies, plans or programmes was barely identified and there was little detail included as to how this might affect the overall direction of the strategic action. Moreover, the development of reasonable alternatives to the strategic actions (or elements thereof)

was generally lacking, or alternatives identified were not reasonable, i.e. they were often used to defend the ‘pre-SEA’ preferred alternative. Finally, many of the Environmental Reports failed to describe with any detail how positive environmental effects resulting from the strategic action might be enhanced and monitored.

5. Conclusions

Overall, the results of this study have shown that the identification and promotion of environmental enhancement measures in Scottish SEA Environmental Reports are variable but mainly lacking. In addition, the results indicate that where the Scottish Government template/guidelines are used in the preparation of the SEA Reports, the integration of environmental enhancement promotion throughout the various stages of the report is minimal in most cases. The recurring failures of the reports in respect of environmental enhancement promotion centre on three key stages of the process. Firstly, when the relevance of the strategic action to environmental enhancement measures in other policies, plans or programmes is identified, there is little detail included as to how this might affect the overall outcome of the strategic action. Secondly, the development of reasonable alternatives to the strategic actions (or elements thereof) is generally not conducted effectively. For example, feasible alternatives are not developed within which environmental enhancement measures are highlighted and the alternatives identified usually serve to defend the pre-determined or preferred alternative of the strategic action. Thirdly, many of the reports fail to describe with any detail how positive environmental effects resulting from the strategic action might be enhanced.

5.1. Recommendations for SEA policy and practice

As many strategic actions have the potential not only to degrade the environment but improve it – for example, through developing brownfield sites, extending and linking wildlife corridors, improving landscape character or historic/cultural assets/resources through landscaping or restoration – actions must be taken to encourage such activity if it is to be consistent with sustainable development. In this respect, the results of this study lead to the recommendation that the Environmental Assessment (Scotland) Act (2005) be amended to put more emphasis on exploiting opportunities to promote environmental enhancement beyond that of offsetting any negative environmental effects. Accordingly, separate guidelines should be developed or adopted which prescribe to SEA practitioners, on a sectoral basis, specific approaches aimed at integrating environmental enhancement as a significant objective of strategic decision making. In particular, the results of the analysis carried out highlight some main issues which guidelines should emphasize:

- SEA practitioners should detail how a strategic action might be developed to reflect the requirements of other policies and strategic actions relating to environmental enhancement.
- The strategic action should be developed in concert with the SEA process; in particular, by way of developing alternatives for the strategic action with regard to environmental enhancement potential.
- The Environmental Report should explicitly detail how positive environmental effects may be enhanced (and monitored) and should highlight appropriate opportunities for environmental enhancement relative to the area affected by the strategic action.

The guidelines on integrating biodiversity considerations into SEA practice published by the Royal Society for the Protection of Birds (RSPB, 2004) or English Heritage (2010) mirror some of the above recommendations. Other guidelines focus more generally on achieving best practice overall in SEA by sector.

Table 3

Summary of the performance of the 15 ERs assessed for the promotion of enhancement.

Grade	Environmental Reports (15)	Scottish Government SEA Guidance Used (6)
Thorough	4	1
Fair	2	0
Minimal	8	4
Absent	1	1

5.2. Recommendations for future research

There is plenty of scope for further research on the topic. For instance, in order to more thoroughly test the inference that lack of environmental enhancement promotion in SEA might be associated with a lack of appropriate guidance, future research may involve interviewing SEA practitioners to assess both in-house and consultative capacity. This would facilitate understanding of the extent to which particular guidelines are followed or otherwise, assess how practitioners perceive their mandate in relation to environmental enhancement promotion through SEA practice, and ascertain whether lack of experience, resources or time – rather than just the quality or availability of guidance – could explain the poorer ratings of the Scottish Government guidance-based SEAs found in this study.

Other studies may extend the scale of this study to include the assessment of ERs in other parts of the UK or internationally with a view to comparing the extent of environmental enhancement promotion in the SEA process between different countries. The scope of the study may also be extended to cover more strategic actions and/or include an analysis of the resulting strategic action in order to develop a clearer picture as to what extent environmental enhancement measures are being adopted post-SEA. Such a study could also focus on the robustness of the monitoring regimes proposed through the SEA process and the extent to which any potential enhancement is being realized beyond the ER. Also, especially in the current credit-crunch climate with resources being a recurrent issue for local authorities, further studies into the effects of limited resources on SEA practice and quality should be carried out.

Next year (2011) marks the tenth anniversary of the SEA Directive in the European Union (Directive 2001/42/EC) and article 12 states that “(1) Member States and the Commission shall exchange information on the experience gained in applying this Directive and (2) Member States shall ensure that environmental reports are of a sufficient quality to meet the requirements of this Directive and shall communicate to the Commission any measures they take concerning the quality of these reports”. With a review of the SEA Directive due in 2013, hopefully the EU will be inspired by the direction SEA practice is taking and stipulate the promotion of environmental enhancement in the Directive itself in line with Article 174 of the Treaty forming the European Council, which provides that Community policy on the environment is to “contribute to, inter alia, the preservation, protection and *improvement* (emphasis added) of the quality of the environment...” and Article 6, which provides that “environmental protection requirements are to be integrated into the definition of Community policies and activities, in particular with a view to promoting sustainable development.”

Future research into the relationship between environmental enhancement and strategic actions is clearly urgently required to allow governments to assess to what extent positive environmental change and, by extension, sustainable development, is being achieved from top level policy through to local planning. Equally, enhancement can have an important role in project EIA – if EIA is considered early enough and forms an integral part of the project design.

References

- Bina OC. A critical review of the dominant lines of argumentation on the need for strategic environmental assessment. *EIA Rev* 2007;27(7):585–606.
- CBD convention on biological diversity. News report ‘Biodiversity and sustainable development’; 2002. Online resource: <http://www.cbd.int/doc/newsletters/news-sd-suplement-en.pdf> (last accessed 2 November 2009).
- Department of the Environment Farming Rural Affairs. Securing the Future ‘Chapter 5: A future without regrets: protecting our natural resources and enhancing the environment’; 2005. Online resource: <http://www.defra.gov.uk/sustainable/government/publications/uk-strategy/documents/Chap5.pdf> (last accessed 30 June 2010).
- English Heritage. Strategic environmental assessment, sustainability appraisal and the historic environment; 2010. Online resource: <http://www.helm.org.uk/upload/pdf/Strat-env-ass.pdf?1278140705> (last accessed 09 July 2010).
- Environment Agency. ‘Lower Derwent flood risk management strategy – Enhancements’; 09 July 2010. last accessed.
- Fuller K. What is strategic environmental assessment (SEA)? The Institute of Environmental Management and Assessment ebrief; 2004. Online resource: <http://www.iema.net/sections/readingroom/show/167/c175> (last accessed 30 July 2009).
- Hales R. Land-use development planning and sustainable development. *J Environ Planning Manag* 2000;43(1):99–121.
- Horton S, Memon A. SEA: the uneven development of the environment? *EIA Rev* 1997;17(3):163–75.
- João E, McLauchlan A. SEA Audit Report: Environmental report of the [Anonymous] Scottish local authority local plan strategic environmental assessment, September 2005 version; 2005 (Unpublished).
- João E. Key principles of SEA. In: Schmidt M, João E, Albrecht E, editors. *Implementing Strategic Environmental Assessment*. Berlin: Springer-Verlag; 2005. p. 3–14.
- McLauchlan A, João E. An independent body to oversee strategic environmental assessment in Scotland: bureaucratic burden or efficient accountable administration? – A preliminary report; 2005. Online resource: <http://www.scotlink.org/pdf/LINK%20SEA%20report%20mar05.pdf> (last accessed 19 August 2009).
- Ng K, Obbard J. Strategic environmental assessment in Hong Kong. *Environ Int* 2005;31(4):483–92.
- Nilsson M, Dalkmann H. Decision making and strategic environmental assessment. *J Environ Assess Pol Manag* 2001;3(3):305–27.
- ODPM Office of the Deputy Prime Minister. A practical guide to the strategic environmental assessment directive; 2005. Online resource: <http://www.iema.net/sections/readingroom/show/7915/c175> (last accessed 12 July 2009).
- Partidário MR. Strategic environmental assessment: key issues emerging from recent practice. *EIA Rev* 1999;16(1):31–55.
- RSPB Royal Society for the Protection of Birds. Strategic environmental assessment and biodiversity: guidance for practitioners; 2004. Online resource: http://www.rspb.org.uk/Images/SEA_and_biodiversity_tcm9-133070.pdf (last accessed 23 August 2009).
- Scottish Executive. Scotland’s biodiversity: it’s in your hands. An executive strategy setting out a 25 year framework for action to conserve and enhance of biodiversity in Scotland; 2004. Online resource: <http://www.scotland.gov.uk/Publications/2004/05/19366/37250> (last accessed 20 August 2009).
- Scottish Government. Choosing our future: Scotland’s sustainable development strategy; 2005. Online resource: <http://www.scotland.gov.uk/Publications/2005/12/1493902/39032> (last accessed 12 July 2009).
- Scottish Government. Strategic environmental assessment tool kit; 2006a. Online resource: <http://www.scotland.gov.uk/Resource/Doc/148434/0039453.pdf> (last accessed 22 June 2009).
- Scottish Government. SEA templates – with guidance; 2006b. Online resource: <http://www.scotland.gov.uk/Topics/SustainableDevelopment/guidancenotes> (last accessed 2 June 2009).
- Scottish Government. Database of all SEA activity in Scotland since July 2004; 2009a. Online resource: <http://www.scotland.gov.uk/Topics/Environment/SustainableDevelopment/14587/Database> (last accessed 2 August 2009).
- Scottish Government. Strategic environmental assessment; 2009b. Online resource: <http://www.scotland.gov.uk/Topics/Environment/SustainableDevelopment/14587> (last accessed 20 August 2009).
- SDC Sustainable Development Commission. Definitions; 2010. Online resource: <http://www.sd-commission.org.uk/pages/definitions.html> (last accessed 23 February 2010).
- SEA-info.net. Website that seeks to provide a gateway to the latest information on SEA and Sustainability Appraisal; 2009. Online resource: <http://www.sea-info.net> (last accessed 20 August 2009).
- SEEG Scottish Executive Environment Group. Strategic environmental assessment: a consultation on the proposed environmental assessment (Scotland) Bill; September 2004. Paper 2004/12.
- Steinemann A. Improving alternatives for environmental impact assessment. *EIA Rev* 1999;21(1):3–21.
- Therivel R. *Strategic Environmental Assessment in Action*. 1st ed. London: Earthscan; 2004.
- TRL Ltd. Centre for sustainability. Strategic environmental assessment of local implementation plans: mitigation; 2004. Online resource: <http://www.sea-info.net/files/general/task3.3.PDF> (last accessed 20 August 2009).

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