



## **GREEN INFRASTRUCTURE IMPLEMENTATION AND EFFICIENCY**

**ENV.B.2/SER/2010/0059**

### **Annex VII: Detailed Impact Assessment of the Four Options**

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## TABLE OF CONTENTS

### Contents

<b>1</b>	<b>OVERALL ASSESSMENT OF THE OPTIONS .....</b>	<b>5</b>
<b>2</b>	<b>OVERALL ASSESSMENT OF OPTION 1 .....</b>	<b>8</b>
<b>2.1</b>	<b>Impacts of option 1 on the environmental dimension.....</b>	<b>8</b>
<b>2.2</b>	<b>Impacts of option 1 on the economic dimension by 2030 .....</b>	<b>11</b>
<b>2.3</b>	<b>Impacts of option 1 on the social dimension (including jobs) by 2030 .....</b>	<b>12</b>
<b>2.4</b>	<b>Impacts of option 1 on overall governance by 2030 .....</b>	<b>12</b>
<b>2.5</b>	<b>Synthesis overview of impacts associated with option 1 .....</b>	<b>13</b>
<b>3</b>	<b>OVERALL ASSESSMENT OF OPTION 2 .....</b>	<b>16</b>
<b>3.1</b>	<b>Impacts of option 2 on the environmental dimension.....</b>	<b>16</b>
<b>3.2</b>	<b>Impacts of option 2 on the economic dimension by 2030 .....</b>	<b>19</b>
<b>3.3</b>	<b>Impacts of option 2 on the social dimension (including jobs) by 2030 .....</b>	<b>20</b>
<b>3.4</b>	<b>Impacts of option 2 on overall governance by 2030 .....</b>	<b>21</b>
<b>3.5</b>	<b>Synthesis overview of impacts associated with option 2.....</b>	<b>21</b>
<b>4</b>	<b>OVERALL ASSESSMENT OPTION 3 .....</b>	<b>25</b>
<b>4.1</b>	<b>Impacts of option 3 on the environmental dimension.....</b>	<b>25</b>
<b>4.2</b>	<b>Impacts of option 3 on the economic dimension by 2030 .....</b>	<b>28</b>
<b>4.3</b>	<b>Impacts of option 3 on the social dimension (including jobs) by 2030 .....</b>	<b>29</b>
<b>4.4</b>	<b>Impacts of option 3 on overall governance by 2030 .....</b>	<b>30</b>
<b>4.5</b>	<b>Synthesis overview of impacts associated with option 3.....</b>	<b>30</b>
<b>5</b>	<b>OVERALL ASSESSMENT OPTION 4 .....</b>	<b>34</b>
<b>5.1</b>	<b>Impacts of option 4 on the environmental dimension.....</b>	<b>34</b>
<b>5.2</b>	<b>Impacts of option 4 on the economic dimension by 2030 .....</b>	<b>37</b>

<b>5.3</b>	<b>Impacts of option 4 on the social dimension (including jobs) by 2030 .....</b>	<b>38</b>
<b>5.4</b>	<b>Impacts of option 4 on overall governance by 2030 .....</b>	<b>39</b>
<b>5.5</b>	<b>Synthesis overview of impacts associated with option 4.....</b>	<b>39</b>
<b>6</b>	<b>SYNTHESIS .....</b>	<b>43</b>

## 1 OVERALL ASSESSMENT OF THE OPTIONS

The environmental, economic, social and governance impacts of options 1-4 up to 2030 are summarised in the four sub-sections below. Impacts which could be felt as early as 2020 are also discussed. The summary of the reference point may be found in the main report (chapter 2, section 2.5).

The assessment focused on a 2030 dateline because this comprises the halfway point between the date the target was set and the 2050 biodiversity vision target. In addition, it is considered that many green infrastructure initiatives will require at least 10 years to be planned, implemented and then to have a significant ecological impact. The shorter 2020 target has however also been addressed in the synthesis of the impacts, where the discussion identifies the impacts might be felt as early as 2020.

The overall impacts of each one of the options cannot be determined with precision, largely because the exact scale and intensity of some actions (eg spending) is uncertain under each option. It is also uncertain how ecosystems will react to some of the measures, especially in the face of future pressures (such as climate change) that are likely to increase to some extent. In the below assessments the team has nevertheless tried to create an approach that allows a synthesis/judgement across a wide range of disparate areas.

Where possible we have based our assessments on quantified indicative estimates expressed in a combination of qualitative, quantitative (including percentage changes<sup>1</sup> with respect to key indicators of benefits) and monetary to help use the most effective means of representing and comparing changes in relation to the 2011 reference point. This is to make the assessments as clear and transparent as possible but not meant to be included in the final report as this would suggest a level of precision and certainty/robustness of the estimates which would be misleading. Indeed, unless specific references are given, the impact and cost estimates in this Annex are not based on specific direct calculations, but are expert judgements informed by the findings from the present study on the biodiversity and ecosystem service benefits of the different green infrastructure elements and the costs associated with green infrastructure measures. More specifically, the judgements build on the earlier material in this report and on the insights on biodiversity/resilience indicators in chapter 4 and 5 of the main report, and costs and benefits in chapter 6.

The ordinal categories used in the assessment are defined in the table below. The expected changes are presented in different forms – by arrows to give direction of the change (an approach the MA (2005) and NEA (2010) also adopt), percentages to ensure consistency and as orders of magnitude of additional costs, where this is more relevant (i.e. economic impacts). Green boxes indicate beneficial changes and light red indicates detrimental changes.

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<sup>1</sup> The use of percentages, also provides a more flexible and adaptable approach for the working document than the use of ordinal categories. This is important because some of the options are only likely to provide small incremental benefits, which could be obscured by a simple and broad category-based assessment.

↗↗↗↗↗	Very high increase (eg >100%)	e.g. € billions+	<b>Very Beneficial change</b> In some cases monetary values are relevant and possible to estimate; in other case the % change (quantitative) (ideally backed up by indicators) will be the more appropriate approach; and in yet others simply a qualitative picture can be presented, differentiating different levels of importance.  The picture would likely have to combine all three levels. There is not a one to one correspondence between the levels and indicators types, but a broad correspondence.
↗↗↗↗	High increase (eg 50-100%)	e.g. 100s € millions	
↗↗↗	Moderate change (eg 20-50%)	e.g. € 10s millions	
↗↗	Small change (eg 10-20%)	e.g. € millions	
↗	Minor change (eg <10%)	e.g. €100,000	
→	Stable/ no change		
↘	Minor change (eg <10%)	e.g. €100,000	<b>Detrimental change</b> - of different scale and cost (in some cases monetary values are relevant, on others the % change (quantitative) (ideally backed up by indicators) and in others simply a qualitative). The picture would likely have to combine all three levels.
↘↘	Small change (eg 10-20%)	e.g. € millions	
↘↘↘	Moderate change (eg 20-50%)	e.g. € 10s millions	
↘↘↘↘	Large decline (eg 50-100%)	e.g. 100s € millions	
↘↘↘↘↘	Very large decline (eg >100%)	e.g. € billions+	
V	Variable, changes being context-specific, difficult to come to a conclusion as regards net impacts.		
<b>Very Detrimental change</b>			

The assessments of the impacts included in the tables below are generally the result of a combination of the impacts for each green infrastructure element taken individually. Table 1.1 below provides an example of this intermediate step towards coming to a combined assessment for an ecosystem service category. The tables included in this report only include a single estimate, representing the combined impact (overall estimate in the right hand column) on the issue being assessed. The thinking underpinning the estimate is briefly outlined in the tables under the heading “short rationale/explanation”.

**Table 1.1: Intermediate step of assessment leading to overall expected impact estimate**

Carbon storage and sequestration	Core areas	Restoration zones	Sustainable use/ Ecosystem service zones	Green urban and peri-urban areas	Natural connectivity features	Artificial connectivity features	Overall estimate to be included in table
	↗	↗	↘ (ag land)	↘	↘	→	↘ -5%

It is important to clarify upfront that the impacts reported for options 2, 3 and 4 relate to the reference point rather than the business as usual scenario, i.e. the baseline scenario/ options 1. In other words, the values provided in the assessments below consistently, across all four options, describe the impacts/trend compared to the reference point. An alternative approach would have been to compare the impacts of options 2, 3 and 4 to the impacts under the business as usual scenario (i.e. the baseline) and to highlight the difference between options 2, 3 and 4 and the BAS. While both are valid approaches, this approach was chosen in particular because of the non-exclusive character of the four options. Indeed, as explained in the main report, “the changes foreseen under each one of the policy options are not mutually exclusive. This implies that as a general rule, measures taken under option 2 (e.g. increase in funding or providing technical assistance and guidance) are automatically and implicitly included among the measures taken under option 3 (as far as this is consistent with the overall characterisation of the option). Thus, the options are incremental and additive (option 1; option 2 = 1+2; option 3 = 1+2+3; option 4 = 1+2+3+4).”

The narrative accompanying the individual assessment does however occasionally highlight how certain impacts for options 2, 3 and 4 compare to the impacts under the BAS (no policy change) scenario.

## 2 OVERALL ASSESSMENT OF OPTION 1

### 2.1 Impacts of option 1 on the environmental dimension

**Table 2.1 : Overview effects of option 1 on GI elements and their benefits by 2030** (arrows and %ages relative to reference point)

	Core areas	Restoration zones	Sustainable use/ Ecosystem service zones	Green urban and peri-urban areas	Natural connectivity features	Artificial connectivity features	SHORT RATIONALE/ EXPLANATION
<b>Overall stock</b>	↗↗  +20% (mainly marine)  (Terrestrial: ↗ Marine: ↗↗↗)	↗ +10%  (with significant variation across MS)	V	↘↘  -20%	↘ -10%	↗↗ +20%	MS have clear legal obligations under the HD to increase the area of Natura sites, especially in the marine environment; restoration measures are also underway and the EU Biodiversity Strategy has a target to restore 15% of degraded ecosystem, but this is not legally binding. However, some core areas are not protected and there are no strong measures to counteract certain trends of declining GI urban elements and natural connectivity features. Many road schemes now include connectivity features as mitigation measures
<b>Ecological quality of the stock*</b>	↗ +10%	↗ By definition all are expected to improve	↘↘ -20%	V	↘↘ -20%	→	An increasing focus of the HD is the need to ensure Natura sites are in favourable conservation status, and there is a Biodiversity strategy target for this. However, core areas outside protected areas tend to be adequately managed and subject to significant pressures. See above for other factors.



Overall expected impact from combined elements on ecosystem resilience and biodiversity		SHORT RATIONALE/ EXPLANATION
Area of habitats of Community interest	<p>↘ ↘</p> <p>-20%</p>	Many such habitats have significant areas outside Natura sites and these are likely to be at risk; semi-natural grasslands in Natura sites also likely to decline due to agricultural abandonment
Condition of habitats of Community interest	<p>↗ ↗ ↗</p> <p>+50%</p>	The EU Biodiversity Strategy now has a clear target of doubling the number of habitat assessments that show an improved conservation status. But this is ambitious so unlikely to be met without significant new measures such as under Options 2, 3 and 4
Population status of species of Community interest	<p>↗ ↗</p> <p>+20%</p>	The EU Biodiversity Strategy now has a clear target of increasing the number of species assessments that show an improved conservation status by 50%. Although this is not as ambitious as the habitat target is unlikely to be achievable without new and greatly expanded because many species have significant populations outside Natura sites and these are likely to be at risk. Some species in Natura sites and other PAs are also at risk from external and international impacts (eg climate change, hunting on migration etc)
Population status of other species	<p>↘ ↘ ↘</p> <p>-30%</p>	Currently weak measures for species in the wider environment, and observed declines in forest and agricultural species in west EU likely to spread to east.
Ecosystem resilience	<p>↘ ↘</p> <p>-20%</p>	Decline likely due to declines in habitat area, habitat quality, of the zones of sustainable land use and reduced connectivity between landscape elements.

Overall contribution from combined elements to provision of other environmental benefits		SHORT RATIONALE/EXPLANATION
Regulation of water flows	<p>↘</p> <p>-15%</p>	The increase in restoration zones and improved quality of core habitats means can only improve regulation of water flows in some areas. The loss of other key GI elements, especially in urban areas and along rivers, and the absence of a Strategy to enhance the role of GI for water management in many places means this ecosystem service will decline.
Water purification	<p>↘ ↘</p> <p>-15%</p>	While the capacity of water purification of capacity of core areas may increase slightly, the loss of connectivity elements, in particular along rivers and deterioration of the stock in sustainable use zones means that the potential of ecosystem to deliver water purification will overall be declining.
Carbon storage and	<p>↘ ↘</p> <p>-15%</p>	While overall the carbon storage capacity by European forests (in PAs and outside) increases proportionally the increase in its surface area, the loss of a wide range of GI elements (e.g. Sustainable use/ Ecosystem

<b>sequestration</b>		service zones - <i>agricultural land</i> ) and the absence of a land management which increases its capacity to store carbon means that overall carbon storage capacity of European ecosystems will decline.
<b>Temperature control</b>	↘ <b>-10%</b>	The loss of green infrastructure elements in urban areas with only limited proactive strategic investment in green roofs and other measures to green urban areas means that increase weather events in urban areas including heat waves are increasing.

## 2.2 Impacts of option 1 on the economic dimension by 2030

Economic Issues ↘ = worse		Comments
Administrative costs (at EU and MS level)/yr	<p>↘</p> <p><u>Magnitude:</u> small: Hundreds of thousands € per MS</p>	Relative to the current situation (cf reference point), administrative costs at EU and MS level can be expected to slightly increase. While administrative costs for pro-active investment to support GI are assumed not to increase under this option, administrative costs with having to address adverse impacts of ecosystem degradation and the need to find substitutes to ecosystem services lost will increase, given they go hand in hand with ecosystem degradation.
Financial costs (one-off)/yr	<p>→ of action / ↘↘↘ of non-action</p> <p><u>Magnitude:</u> incremental costs: tens of millions €</p>	No incremental action no incremental financial costs from action. Though some incremental costs likely from lack of additional action – as there risks being an increase in defensive expenditure to address ecosystem degradation, e.g. replacing ecosystem services, restoring some GI, development of artificial connectivity features to mitigate impacts of grey infrastructure). Level of cost depends on level of responsiveness to the problem
Financial costs (recurrent)/yr	<p>→ of action / ↘↘↘ of non-action</p> <p><u>Magnitude:</u> hundreds of millions / billions €</p>	The cost of maintaining and/or increasing the ecological quality and resilience/coherence of protected areas will increase as the stock and quality of sustainable use zones declines as recent trends can be expected to continue. Cost on provisioning of services to substitute loss of services from ecosystems will rise (e.g. clean water provision); similarly health expenditure goes up as health benefits from GI decline due to a continued increase in the share of the population living in urban areas, without an enhancement of urban GI.
Opportunity costs/yr	No incremental private opportunity cost.	No incremental/additional opportunity costs as no incremental/new action.
Natural Resources (crops, wood & fish)/yr	<p>↘↘↘</p> <p><u>Magnitude:</u> tens of millions € /year</p>	As overall both the stock and average quality of the green infrastructure will decline, its productivity in terms of provision of natural resources will also fall as there will be an insufficient amount of measures to increase the enhance GI qualitatively (which does mean that productivity from non GI-land will also decline – this relates to land which is currently sustainably managed).
Land and Property values (by 2030)	→	The limited investment in GI creation means that property values are unlikely to witness an overall measureable increase related to proximity/increased accessibility of GI, although locally, such an increase has been observed and can be linked to GI initiatives.

Note: cost of measures indicator average; relate to country insights from Task 4.1 and 3.

Note: the above table tried to distinguish between the issue of costs related to actions, and that related to inaction. In the former the incremental direct costs are zero, but for the latter there are costs associated with losses (from ecosystems/loss of natural capital) and cost of responses. These are also presented here, but will in part also be picked up by the benefits of action line. In the finalisation of the work we will assess how best to avoid double counting / making the same message in two places.

### 2.3 Impacts of option 1 on the social dimension (including jobs) by 2030

Social Issues		Comments
Investment and Employment: Number/quality of jobs; economic activity generated	→	While a range of jobs related to healthy and productive ecosystems will get lost (e.g. in the fisheries sector over time), some of this loss is likely to be compensated by the increase in jobs linked to addressing adverse impacts of the overall deterioration (increase of defensive spending), the restoration of elements, the creation of artificial connectivity features.
Health benefits and well-being/quality of life (air quality, accessibility for exercise and amenity)	↘↘ -20%	The loss of GI near to human settlements/urban areas means that the health benefits of GI will further decline from no additional policy action (which also assumes that there is no pro-active policy to improve access of urban residents to green areas further away from cities or a specific strategy for using GI in view of the health benefits it may provide)..
Tourism and Recreation	↓ -10%	While overall tourism is expected to increase (if historical trends continue), locally, some of the potential will get lost due to a decrease in the attractiveness of some cities and countryside where there is a loss of GI elements. Hence, some areas might experience an important decrease in their attractiveness due to the loss of their high quality natural environment which some tourists might seek to find further away, outside Europe. The increase in tourism in protected areas will only partly compensate for this loss, but unlikely to compensate entirely.
Education	↘↘ -15%	The increase in stock of core areas and its quality means that their educational purpose will increase. The parallel decline of GI near human settlements/urban areas as well as the decline in stock and quality of most other GI elements however means that they will be increasingly poor in biodiversity and the disconnect between citizens and nature will further decrease, especially in the absence of proactive measures for awareness raising.

### 2.4 Impacts of option 1 on overall governance by 2030

Other issues: Good governance / Practicability and Enforceability		Comments
Practicability	→	No additional challenges.
Enforceability	→	No additional challenges.
Acceptability	↘	Lack of policy coherence, increased gap between commitments and action on the ground.
Clarity, consistency & understandability	↘	Lack of policy coherence, increased gap between commitments and action on the ground.

## **2.5 Synthesis overview of impacts associated with option 1**

Table 2.2 below provides a synthetic overview of the environmental, economic and social impacts associated with the implementation of option 1. The most striking features of the outcome of this option compared to the baseline are:

### ***Option's overall effectiveness***

#### ***Environmental dimension***

Increase in overall stock of core areas, primarily due to increase marine protected areas. Improvement of the ecological quality of core areas, especially due to restoration activities linked to conservation objectives.

Other green infrastructure elements outside protected areas are expected to decline to 2030, whether due to degradation or fragmentation or to loss of natural areas from urban sprawl.

These improvements in the core areas will not compensate for losses from the wider green infrastructure.

#### ***Socio-economic dimension***

A certain number of jobs are lost but others compensate for this loss, especially in areas which can be considered defensive expenditure, i.e. replacement of ecosystem services lost, restoration activities, ex-ante or ex-post mitigation of impacts of grey infrastructure. Overall, this is a combination of one-off costs and recurrent expenditure but defensive expenditure investments have a rather limited potential to result in long-term growth/increase in economic activity; proactive investment in natural capital arguably offers greater potential support for growth/economic activity.

### ***Option's acceptability and costs***

#### ***Economic dimension***

Overall we would expect rather high costs of loss of ecosystem services and needs to invest in substitutes under the BaU compared with scenarios (under different policy packages) which would have seen the stock of other elements stabilise or increase and their quality improve. As the context here is one of deterioration and loss of a range of green infrastructure elements which are essential for coherence and resilience, in particular sustainable use zones, artificial connectivity features, the costs are higher than they would otherwise need to be.

With deterioration of its quality, the productivity of the green infrastructure declines as the green infrastructure declines and measures to improve the quality of the remaining stock of green infrastructure are insufficient, although locally there might be exceptions, for example where restoration measures are actually implemented.

While in the absence of any additional measures, there are no new costs associated with such measures, defensive measures, to address the adverse impacts related with further ecosystem deterioration, need to be taken. These are very costly indeed. In addition, the

cost associated with the continuation of current measures to support Europe's green infrastructure increase, as overall coherence and quality is on the decline.

***Governance dimension***

From a social and political point of view, there is a lack of coherence in this policy option which results in its efficiency being questionable. Not addressing the needs for wider environmental and social goods to be integrated into policies affecting green infrastructure will most probably result in a loss in credibility and trust in the political system due to an increased perception that the type of growth it delivers comes at the cost of a deterioration of the quality of life and well-being.

***Synergies / trade-offs between the different measures components of the option***

When looking at the measures under the BAS, there are important trade-offs that are not acknowledged and accounted for, resulting overall in a lack of coherence and integration across existing policies which undermine the cost-effectiveness both of policies in place to support the green infrastructure and those policies which have adverse effects on the stock and the quality of green infrastructure.

***Identification of impacts foreseen which could be felt as early as 2020***

Most of the impacts described in option 1 are already being observed and in the absence of any additional measures they are expected to further amplify.

**Table 2.2: Synthesis: overview of impacts associated with implementation of option 1**

	Reference Point	Option 1 – Baseline
General Issues		
Addressing the problem/challenge – biodiversity & ESS loss <sup>2</sup>	Not sufficiently. Loss ongoing (with some exceptions e.g. Natura 2000)	No – significant opportunities missed; expected continued risk of loss of biodiversity and ESS ↘ ↘
Environmental Issues (synthesis)		
Biodiversity & Habitats	Significant biodiversity benefits from existing green infrastructure	Overall declines despite progress in some areas ↘
Overall coherence and resilience	Limited connectivity undermining effective coherence and reduce resilience	Expected decline (from expected fragmentation et al) ↘ ↘
Provision of other environmental benefits	Significant range of very important benefits (provisioning, regulating, cultural and supporting services)	Overall decline ↘ ↘
Economic Issues		
Administrative costs (at EU and MS level)/yr	Core area (N2K): 5.8bn/year Other areas un-estimated	↘ <u>Magnitude</u> : small: Hundreds of thousands per MS
Financial costs (one-off)/yr		→ of action / ↘ ↘ ↘ of non-action <u>Magnitude</u> : incremental costs: tens of millions/year
Financial costs (recurrent)/yr		→ of action / ↘ ↘ ↘ ↘ of non-action <u>Magnitude</u> : hundreds of millions / billions /year
Opportunity costs/yr		No additional opportunity costs
Social Issues		
Number/quality of jobs; economic activity generated	GI and its services an important foundation for the economy and livelihoods	Limited/sub-optimal →
Health benefits & quality of life	Important benefits	Decline from loss of air pollution regulation services / access to nature ↘ ↘
Recreation & Tourism	Important benefits	Decline from loss of access to nature ↘
Other issues: Good governance / Practicability and Enforceability		
Practicability	n/a	Unchanged. →
Enforceability	n/a	Unchanged. →
Understandability and acceptability	Some lack of coherence; important public goods losses	Limited ↘
Clarity and consistency	Insufficient integration and ‘joined up thinking’	Lacking ↘

<sup>2</sup> ie halting the loss of biodiversity and ecosystem services in Europe. This question looks at whether the design of the option actually addressed the real problem – in the sense of focus rather than effectiveness. Hence it is the intention and targeting of the option that is assessed here and not its effect.

### 3 OVERALL ASSESSMENT OF OPTION 2


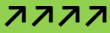



#### 3.1 Impacts of option 2 on the environmental dimension

**Table 3.1: Overview effects of option 2 on GI elements and their benefits by 2030** (arrows and %ages relative to reference point)

	Core areas	Restoration zones	Sustainable use/ Ecosystem service zones	Green urban and peri-urban areas	Natural connectivity features	Artificial connectivity features	SHORT RATIONALE/ EXPLANATION
<b>Overall stock</b>	↗↗  +20% (mainly marine)	↗↗  +15%	∨	↘  -10%	↘  -5%	↗↗↗  +25%	Additional measures unlikely to affect overall core area, but additional funding (eg cohesion) could stimulate some additional restoration activities and the application of artificial connectivity features. Improved GI awareness could reduce the rate of loss and degradation of urban GI and natural connectivity, and increase measures to mitigate deterioration in connectivity.
<b>Ecological quality of the stock</b>	↗↗  +15%	By definition all are expected to improve	↘  -10%	∨	↘  -10%	→	Some additional benefits for core areas resulting from improved funding, advice etc; GI awareness, advice and knowledge sharing could stimulate better management of wider environment.








Note that the arrows/values above relates to expected change relative to the reference point. A loss above may still represent an improvement relative to the BaU baseline. For example, continued degradation of urban and peri urban areas are expected, but at a lesser rate overall than under the BaU – as more cities will be engaged in GI under this scenario than under BaU.



Overall expected impact from combined elements on ecosystem resilience and biodiversity		SHORT RATIONALE/ EXPLANATION
Area of habitats of Community interest	 -20%	MS obligations under HD are main driver for protection and will be unaffected by Option 2, no significant measures expected for the many habitats with significant areas outside Natura sites which continue to be likely at risk.
Condition of habitats of Community interest	 +65%	Some modest benefits from increased funding, advice and knowledge sharing
Population status of species of Community interest	 +30%	Some modest benefits from increased funding, advice and knowledge sharing.
Population status of other species	 -25%	Most benefits of increased funding etc are likely to be focussed on higher priority species, so benefits will be small for most species.
Ecosystem resilience	 -15%	Combined impact of above measures may improve habitat condition and connectivity in certain vanguard countries through improved knowledge exchange on land management, though no significant effects in all MS.

Overall contribution from combined elements to provision of other environmental benefits		SHORT RATIONALE/EXPLANATION
Regulation of water flows	↗ + 5%	Guidance documents on the use of GI targeted at the water sector, toolkits for integration of GI in urban planning are all tools which should lead to improvements of the regulation of water flows at various scales including in urban areas. This is the case, if, in addition, EU funding is increasingly channelled towards Natural Water retention measures under the WFD or other policy areas. Some capacity for water regulation, however, continues to get lost through sub-optimal management of ecosystems. Expected losses of natural connectivity features in river systems are still likely to affect the provision of this service as does the loss of green urban and peri-urban areas, due to impacts on the development of sustainable urban drainage systems.
Water purification	↗ + 5%	Combined with the Water Framework Directive and specific guidance and funding for ecosystem based solutions to improving water quality both targeted at the water sector but also through a greater uptake of relevant agri-environmental measures due to targeted technical assistance.
Carbon storage and sequestration	↘ -5%	The overall capacity of ecosystems to store carbon will slightly increase due to some increased quality of the stock. It is presumed here that technical assistance/support/guidance related to GI management will lead to a higher uptake of carbon optimised land management practices and measures under CAP pillar 2, and the WFD (on wetlands). As in option 1 the better condition of core areas will also enhance their capacity to store carbon (e.g. deadwood). Much of the gains will however be off-set by losses in other GI elements due to general intensification of land use. Particularly in relation to sustainable managed forests as the increased pressure of different demands will not be sufficiently addressed, hence only a limited improvement compared to the baseline and still a negative trend compared to the reference point..
Temperature control	↗ +10%	The appropriate guidance and funding, in particular targeted at climate change adaptation in cities, means that an increasing amount of GI for climate adaptation, such as green roofs, walls and green areas, will be developed in cities and will in particular deliver benefits to urban populations.

### 3.2 Impacts of option 2 on the economic dimension by 2030

Economic Issues		Comments
Administrative costs (at EU and MS level)/yr	 Magnitude: Hundreds of thousands €	Additional administrative capacity at EU level will be required to coordinate the OMC, EC level research projects, production of GI toolkit, setting up of a Gateway and integrating GI into a range of Strategic Documents etc. Applicants for funding will submit more applications for funding GI projects as opposed to alternatives but this will mostly be covered by reallocation and retraining of staff rather than new recruitments.
Financial costs (one-off)/yr	  of action Magnitude of additional costs: A couple of millions €	<p>Much of the funding for GI under this option is not additional funding but funding which is already budgeted which would go to GI projects and programmes rather than new/additional funding.</p> <p>In addition, the cost of a whole range of ecosystem based solutions will go down as they become more common and experience in implementing them increases. Initially, technical assistance and guidance etc. development will require initial investments.</p>
Financial costs (recurrent)/yr	 of action Magnitude: A couple hundreds of thousands € /year	The OMC will result in some additional recurrent costs associated with GI action. Updating and disseminating the guidance and toolkits (e.g. maintenance of GI Gateway) will require some regular spending as well.
Opportunity costs/yr	 Magnitude: A couple hundreds of thousands € /year	While the funds and additional administrative capacity is not thought to directly result in major opportunity costs as a high returns on the investments is expected, the use of certain areas for the development of GI will sometimes require trade-offs with alternative uses of the land. Still, a huge majority of the investments under this option are thought to be cost-effective ways to use the land and one can expect most of the land to be designated as/converted to be used as green infrastructure to be among the least productive land.
Natural Resources (crops, wood and fish)/yr	 Magnitude: Hundreds of millions €	The provisioning services are not thought to increase much as a result of increased GI investments. The overall GI increase, while it will go hand in hand with an increase in ESS, will overall result in a small fall of the natural resources (wood, crops etc.) which are extracted from the land which has been “converted” to GI. The marine protected areas however overall result in an improvement in the quality of the fish stock and an increase of fish catch outside the protected areas, which results in small overall gains in this impact area.
Land and Property values (by 2030)	 Magnitude: 1% increase	Especially the GI integration toolkit for spatial and regional planners, in combination with the integration of the Thematic Strategy on the Urban Environment and the E&H Action Plan, will result in an increase of the quality of life in certain urban areas which will increase the value of certain properties, without resulting in major trade-offs.

### 3.3 Impacts of option 2 on the social dimension (including jobs) by 2030

Social Issues		Comments
Investment and Employment: Number/quality of jobs; economic activity generated	↗ <b>+5%</b>	Compared to the BAS, the increased investment in ecosystem based solutions and restoration of ecosystems results in a slight creation of additional jobs linked to increasing the capacity to apply for, develop and implement these new types of projects. Also, some jobs which would otherwise have lost due to the deterioration of the quality and productivity of ecosystems are preserved under this option. Spatial planning becomes more sophisticated and complex, requiring people with a wider range of skills and backgrounds, including jobs related to assembling the evidence on GI and its benefits for more informed spatial planning. The increased demand for GI creation, especially in urban areas, also offers opportunities job creation with lower qualification. Although some jobs in other activities might be crowded out (e.g. non ecosystem based solutions) the net effect is thought to be slightly positive.
Health benefits and well-being/quality of life (air quality, accessibility for exercise and amenity)	↘↘ <b>-10%</b>	Investment in GI, including in urban areas thanks to a revised Thematic Strategy on the urban environment, the Environment and Health AP and the toolkit for spatial planners, increases, in particularly pro-active urban areas; the provision and accessibility of GI for health benefits and amenity increases in those proactive urban areas. In the absence of a coherent EU wide strategy, GI however overall continues to deteriorate in a majority of urban areas in Europe despite progress in a small vanguard of cities. Some creation of multipurpose green space and improved accessibility of green areas means that less health benefits of GI get lost compared to the BAS.
Tourism and Recreation	↘ <b>-5%</b>	Tourism and recreation declines less than under the BAS in particular thanks to the increased in investment in ecosystem based solutions to e.g. climate change adaptation and flood risk control increases the provision of multifunctional areas around urban areas which offer recreation benefits. In the absence of any binding measure to improve the preservation of GI across the wider landscape, however, certain areas continue to lose e.g. valuable connectivity features and become less attractive for recreation and tourism. Hence, overall, still a small decline
Education	↘ <b>-10%</b>	Awareness raising activities reach some of the target groups. Consideration of GI in urban areas resulting creation of parks, green roofs, improved access to green areas etc. slightly increases in particularly pro-active cities and municipalities, resulting in a localised increase in opportunities for experiencing nature and using GI for educational purposes. Results, in some places, in improved access of urban populations to GI. At the same time, existing natural areas continue to be lost and the increased in GI investment cannot compensate for this loss: as overall biodiversity continues to deteriorate, unique or scientifically interesting ecosystems are lost, and the educational value of the overall GI continues to decline, especially since, overall, many of the GI elements continue to decline in stock and quality, which means that their capacity to sustain a broad range of biodiversity which could be observed/studied also declines.

### 3.4 Impacts of option 2 on overall governance by 2030

Other issues: Good governance / Practicability and Enforceability		Comments
Practicability	↗↗	No major challenges although very much depends on MS interest in GI implementation.
Enforceability	↘	As most of the changes fully rely on MS pro-activeness and initiative it is difficult to ensure full success in its implementation and optimal level of implementation. Also, monitoring is made difficult by the absence of a coherent Strategy to reporting and mapping across European MS.
Acceptability	↗↗↗	Some increase in coherence with regard to GI and consistency between messages provided in Strategic documents and the availability of EU funding. This option is very acceptable to all stakeholders as it focuses on improved knowledge, information provision and voluntary use of funding for GI implementation.
Clarity, consistency & understandability	↘	Overall, the messages and new changes are quite consistent as strategic documents and communication is aligned with the availability of funding for GI across relevant funding instruments. Some EU legislation is however not fully consistent with the increased commitment from the EU to support GI conservation and development.

### 3.5 Synthesis overview of impacts associated with option 2

Table 3.2 below provides a synthetic overview of the environmental, economic, social and governance impacts associated with the implementation of option 2. The most striking features of the outcome of this option compared to the reference point and the baseline scenario (BAU - option 1) are:

#### ***Option's overall effectiveness***

Under this option, the objectives are not met.

#### ***Environmental dimension***

The overall effectiveness of option 2 in meeting the objectives associated with the development of a Green Infrastructure Strategy in the EU are rather minimal or at least uncertain, because all measures are of voluntary nature and, therefore, their implementation very much depends on the willingness and openness of the MS.

All measures can (potentially) contribute to the achievement of targets if the uptake and implementation is satisfactory. But due to the lack of binding mechanisms in core areas of ecosystem losses (such as land use, habitat fragmentation etc.) the effect can be expected to be rather low.

#### ***Socio-economic dimension***

Under this option, a range of particularly pro-active municipalities, cities and regions take advantage of the increase in funding available for green infrastructure implementation and this results in direct benefits to their inhabitants. The toolkit for integrated spatial planning addressing the need for the conservation and strategic creation of green infrastructure in urban areas, combined with the revised Strategy for the urban environment results in notable improvements in pro-active urban areas. In a majority of urban areas this approach is however not applied consistently, in part because of a lack of funding for a proper mapping of green infrastructure which could be used in spatial planning. Overall, this therefore still results in a decrease in the health benefits compared with the baseline, although this loss is divided by two compared to the baseline scenario (BAS/ option 1).

Additional jobs are created by the increase in investment in restoration of GI elements. Investments in ecosystem based solution to flood management and climate mitigation and adaptation might crowd out some jobs in sectors which would have offered to pursue the same objective through alternative (grey) solutions but the net effect is neutral.

### ***Option's acceptability and costs***

#### ***Economic dimension***

The costs associated with the option are comparably low as, with the exception of wider EU support, the measures either do not require many financial resources (such as building an information platform or coordinating an OMC) or are already integrated in ongoing processes (such as reviewing existing policies of integrating green infrastructure in regional and spatial planning structures). However, due to the uncertainty of their effectiveness outlined above, the issue of opportunity costs should be bared in mind.

#### ***Governance dimension***

The acceptability of option 2 is, just because of its voluntary and non-binding character, likely to be high among MS. It might shrink with the adoption of the OMC and MS becoming resistant against “progress” made in coordinating activities that require a certain amount of (financial) resources. But in general it seems likely that many MS would support this option as they can show their commitment to EU environmental targets without particular obligations to fulfil them.

#### ***Synergies / trade-offs between the different measures components of the option***

The positive effects of the soft measures of guidance, coordination and awareness raising in option 2 can mostly be enhanced if wider EU support in investments will be ensured. More green infrastructure projects through more flexible funding schemes and a replenishment of funding would also raise the awareness of the concept if projects are carried out successfully and their benefits are disseminated via foreseen information platforms. Also research activities could benefit from more green infrastructure projects as a higher “critical mass” to investigate their benefits could solidify research results, and, consequently, decision-making. Higher awareness through information campaigns and websites, which collate the most relevant and updated information, is beneficial for almost every intended step forward in terms of green infrastructure development in the EU. A good basis of information is a pre-condition for a high uptake and spread of green infrastructure activities across MS, sectors, stakeholders and administrations.

***Identification of impacts foreseen which could be felt as early as 2020***

The shift in expenditure towards ecosystem based projects relying on green infrastructure to deliver its objectives, and the associated small increase in occupation linked to this type of investments, would already be felt by 2020. A wider range of green infrastructure projects can be expected to have been implemented by 2020, and they can be expected to already deliver some of the benefits for which they have been implemented. The toolkit for spatial planning as well as the improved guidance on EIA/SEA will already have practices on the ground and helped preserve green infrastructure which would otherwise have disappeared. This said, the improved practices will only really become mainstream and achieve their full potential in the decade between 2020 and 2030.

**Table 3.2: Synthesis: overview of impacts associated with implementation of option2**

	Reference Point <i>(see section 2.5 for more detail)</i>	Option 2
<b>General Issues</b>		
Addressing the problem/challenge - biodiversity & ESS loss <sup>3</sup>	Not sufficiently. Loss ongoing (with some exceptions e.g. Natura 2000)	The challenge is partially addressed, but insufficiently ↘
<b>Environmental Issues (synthesis)</b>		
Biodiversity & Habitats	Significant biodiversity benefits from existing green infrastructure	Still significant losses in some areas ↘ ↘
Overall coherence and resilience	Limited connectivity undermining effective coherence and reduce resilience	Improvements do not contribute much to increasing resilience/coherence ↘ ↘
Provision of other environmental benefits (water & climate)	Significant range of very important benefits (provisioning, regulating, cultural and supporting services)	The provision of key regulating services is, at least in part, enhanced ↗
<b>Economic Issues</b>		
Administrative costs (at EU and MS level)/yr	Core area (N2K): 5.8bn/year Other areas un-estimated	Magnitude: Hundreds of thousands ↘
Financial costs (one-off)/yr		<b>of action</b> Magnitude: A couple of millions ↘ ↘
Financial costs (recurrent)/yr		<b>of action</b> Magnitude: A couple hundreds of thousands/year
Opportunity costs/yr		↘
<b>Social Issues</b>		
Number/quality of jobs; economic activity generated	GI and its services an important foundation for the economy and livelihoods	Overall small net increase in jobs ↗
Health benefits/quality of life	Important benefits	Health benefits still on the decline ↘ ↘
Recreation & Tourism	Important benefits	Still slight decrease ↘
<b>Other issues: Good governance / Practicability and Enforceability</b>		
Practicability	n/a	↗ ↗
Enforceability	n/a	↘
Acceptability	Some lack of coherence; important public goods losses	↗ ↗ ↗
Clarity, consistency & understandability	Insufficient integration and 'joined up thinking'	↘

<sup>3</sup> ie halting the loss of biodiversity and ecosystem services in Europe. This question looks at whether the design of the option actually addressed the real problem – in the sense of focus rather than effectiveness. Hence it is the intention and targeting of the option that is assessed here and not its effect.
















## 4 OVERALL ASSESSMENT OPTION 3

### 4.1 Impacts of option 3 on the environmental dimension











**Table 4.1 : Overview effects of option 3 on GI elements and their benefits by 2030** (arrows and %ages relative to reference point)

	Core areas	Restoration zones	Sustainable use/ Ecosystem service zones	Green urban and peri-urban areas	Natural connectivity features	Artificial connectivity features	SHORT RATIONALE/ EXPLANATION
<b>Overall stock</b>	↗↗↗ +20% (mainly marine)	↗↗ +15%	→	↘ -5%	→	↗↗↗ +25	Additional measures unlikely to affect overall core area, but additional funding (eg CAP) could stimulate better sustainable use zone management and additional restoration, as would GI maps, stronger incorporation of biodiversity in SEA and EIA and stronger implementation of HD Article 10 landscape measures would help maintain natural connectivity and contribute slightly to reducing rate of loss of GI elements.
<b>Ecological quality of the stock</b>	↗↗↗ +25%	By definition all are expected to improve	↗ +10%	V	→	→	Some additional benefits from funding.

Overall expected impact from combined elements on ecosystem resilience and biodiversity		SHORT RATIONALE/ EXPLANATION
Area of habitats of Community interest	  -10%	MS obligations under HD are main driver for protection in Natura network and will be unaffected by Option 3, but increased actions in wider environment eg under CAP and GI mapping could reduce losses of habitat.
Condition of habitats of Community interest	    +65%	Some benefits from increased funding through CAP, IF targeted at such habitats
Population status of species of Community interest	   +45%	Some benefits from improved Natura habitat condition in certain countries, and reduced habitat fragmentation due to increased restoration (CAP, GI mapping and HD article 10 landscape feature protection)
Population status of other species	   -20%	Some benefits from improved management of wider environment (CAP) and Some benefits from improved Natura habitat condition in certain countries, and reduced fragmentation due to increased restoration (CAP, GI mapping and HD article 10 landscape feature protection)
Ecosystem resilience	 +10%	No significant increases in habitat patches (eg in core areas), but reduced fragmentation due to increased restoration (CAP, GI mapping and HD article 10 landscape feature protection)

Overall contribution from combined elements to provision of other environmental benefits		SHORT RATIONALE/EXPLANATION
Regulation of water flows	↗ + 20%	More systematic mapping of ES and its services and use allows for channelling EU funding for NWRM to the areas where it is most effective. This is further supported by the changes in the CAP, which make agri-environment measures more effective and attractive to farmers. This includes improvement regarding forest environment payments and the potential development of payments for ecosystem services provided by forests (including alluvial forests), grasslands and arable land. Overall, the effectiveness of the funding is increased. Moreover, the expanded scope and effectiveness of EIA/SEA prevents unnecessary losses in these ESS.
Water purification	↗ +10%	The increased quality of sustainable use zones achieved via sector specific changes to legal frameworks, including CAP (e.g. land use management) and Cohesion (e.g. specific financing) would improve the capacity of ecosystems to deliver the service.
Carbon storage and sequestration	↗ +5%	With the increase in quality of core areas their capacity to store carbon will also increase. This is also the case of the more sustainability managed sustainable use/ecosystem service zones, particularly forests via increased payments under the CAP and/or the development of a PES scheme for forests. In addition, improved practice and extended application of EIA/SEA (better/more mitigating/off-setting of adverse impacts, sometimes with the objective of making developments carbon neutral) reduces emissions from development activities/investments.
Temperature control	↗ +15%	The Biodiversity and Climate proofing of the funds means that new EU supported investments tend to contribute to temperature decreases rather than increases in urban areas. In addition, stronger support to GI in cities for its health and micro-climate regulation through innovative financing instruments means an increase of benefits from such measures compared to the reference point. However, the variable status of green-urban and per-urban areas persists and can still negatively impact the provision of this service.

## 4.2 Impacts of option 3 on the economic dimension by 2030

Economic Issues		Comments
Administrative costs (at EU and MS level)/yr	 Magnitude: Tens of millions €	Some more administrative capacity will be needed to make a centralised mapping and information/data on GI processing system at local, regional and EU levels work. Initially, the new requirements imposed, especially in the area of cohesion policy (incl. TEN-T and TEN-E), but also, to a more limited extent, at MS level, for agriculture and the CFP, will mean that additional support and information might have to be provided to applicants.
Financial costs (one-off)/yr	<b>Public gross</b>   Magnitude: billions €	In a wider range of cases EIA and SEA assessments will have to be carried out. This results in some additional private costs for new developments (and likely reduced social losses – see benefits).  Public cost –eg via use of CP, CAP related funds, EFF are not net additional, but reallocation so arguably no additional financial costs overall (although opportunity costs – see below).
	<b>Public net:</b> 	Public expenditure on GI would be very large (Though with important social and other returns – picked up in other criteria). At a gross level this would be in the billions of Euros. Much of this is existing money reallocated (e.g. roads to GI in CP) so at a net level smaller.
	<b>Private:</b> 	
Financial costs (recurrent)/yr	 Magnitude: Couple of millions €	The new requirements to be taken into account when submitting applications for funding (e.g. CP, TEN-T) and requesting authorisation for developments (eg EIA) will require that more resources be invested in these on a permanent basis in regional authorities but also in the private sector.
Opportunity costs/yr	 Magnitude: Tens of millions €	Some potentially significant private opportunity costs can be expected, but given that concern for opportunity costs can be integrated into decision making (e.g. suitable use of spatial planning to help zoning of activities), overall opportunity costs are not expected to be extremely high.
Natural Resources (crops, wood, fish)/yr	<b>Short term</b>  Magnitude: Tens of millions €	The integration of GI for the benefits it delivers will result in some cases to a conversion of land uses or in a diversification of its uses to account for the additional benefits that it could yield which are thought to be of more value combined than if the land was only used for provisioning services. This however results in a decrease in the overall amount of “natural resources” produced in the short term. As this is however thought to potentially result in a small increase in prices for such products, this is not expected to lead in important income losses for producers. In addition, some provisioning services can be expected to increase over time, such as fish stocks.  The long term value of improved natural resource management likely to be critically important though (issue also picked up in benefits) and to bring billions
	<b>Long term</b>  <b>Billions of €</b>	
Land and Property values (by 2030)		Although locally they will be increases in property value (i.e. gains in property values in urban areas linked to the measures from option 2) there may also be loss of value due to a reduction of potential development land

		contributing to a fall in the value of property. Gains might be further offset by a small fall in land values in agricultural land, due to the small decrease in the productivity of the land and a lack of coordination allowing PES-schemes to compensate for income lost and paying for ecosystem services provided.
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### 4.3 Impacts of option 3 on the social dimension (including jobs) by 2030

Social Issues		Comments
Investment and Employment: Number/quality of jobs; economic activity generated	↗↗ +10%	On top of the job creation associated with option 2, some additional jobs are created, e.g. to comply with more strict rules in the area of impact assessment following the revision of the Directives and the demand for experts in the area of biodiversity/ecology, both in the private sector and public authorities both related to the assessment themselves and the need to take compensation measures. Even more jobs which would otherwise have been lost (under the BAS) due to the deterioration and falling productivity of ecosystems are preserved, while the additional measure foreseen here are not thought to lead to important job losses in any sector.
Health benefits and well-being/quality of life (air quality, accessibility for exercise and amenity)	↗ +5%	Not only health benefits linked to newly and strategically created GI in urban areas increase in the most proactive urban areas; the new measures making EIA and SEAs more responsive to the benefits of GI results in the loss of GI in and around urban areas to slow down or to be adequately compensated for it to continue to play its multifunctional role.
Tourism and Recreation	↗↗ +15%	The increased investment in ecosystem based solutions to e.g. climate change adaptation and flood risk control increases the provision of multifunctional areas around urban areas which offer recreation benefits. GI is better preserved across the wider landscape thanks to better consideration in EIA/SEA, the CAP and Cohesion Policy, leading to a better conservation of valuable connectivity features, ensuring that Europe's countryside broadly remains attractive to tourists and visitors from outside Europe which would otherwise not have chosen Europe as a destination for their holidays. This also results in a better recognition of the value of GI for diversifying income sources in the wider countryside by promoting multifunctional uses of the marine, coastal, forested and agricultural lands and more businesses in the sustainable tourism sectors are created than would otherwise have been the case.
Education	↗↗↗ +25%	The improvement in access to nature and its use for educational purposes does not only increase in particularly proactive cities. The preservation of GI in and around urban areas increases with the changes to the EIA/SEA Directives which result in a better conservation of valuable green areas, but also in the incorporation of the benefits and the value of GI in housing developments and urban planning more generally, thus leading to an increase in provision of GI for its benefit to urban populations and biodiversity, thus increasing the education value of green areas in cities. The wider approach of capacity building to increase awareness of the benefits should lead to a growth in interest in ecosystems, their functions, services and interrelations between ecosystems and social and economic systems as well as scientific interest in the functions of ecosystem and the role of components of biodiversity in functions and in service provision.

#### 4.4 Impacts of option 3 on overall governance by 2030

Other issues: Good governance / Practicability and Enforceability		Comments
Practicability	↗	Very practicable, although there might be some resistance to implementing all the legal changes included under this option, especially given competing priorities.
Enforceability	↗↗	Under this option enforcement is very much facilitated by the considerable effort deployed in the area of data and information provision and monitoring.
Acceptability	↗	While very much understandable because of its overall consistency, acceptability may already be declining with this option (compared to option 2 only) as a rather high consensus would be required for all MS being prepared to making resources available and supporting the proposed changes.
Clarity, consistency & understandability	↗↗	This option is fully consistent as legal provisions, communication, and availability of financial support are all aligned. A certain gap between the changes included under 2 and 3 and the nature/scale of the problem/ challenge can however be noted.

#### 4.5 Synthesis overview of impacts associated with option 3

Table 4.2 below provides a synthetic overview of the environmental, economic, social and governance impacts associated with the implementation of option 3. The most striking features of the outcome of this option compared to the reference point and the baseline scenario (BAU - option 1) are:

##### ***Option's overall effectiveness***

Under this option, some of the most important objectives of the Strategy would be met.

##### ***Environmental dimension***

Together with the changes included under option 2, option 3 delivers an increased effective in the conservation of existing Green Infrastructure such as connectivity elements in the wider landscape. The decline in stock and quality of sustainable use/ ecosystem service zones and natural connectivity features is thought to stop and the ecological quality of the former is even expected to slightly increase. Only in an around urban areas, a small decrease in green infrastructure still appears unavoidable.

This has important implications for biodiversity and resilience. Under option 3, for the first time, resilience is actually improved compared to both the reference point and the baseline scenario. While conditions of habitats and population of species to community interest both significantly improve, option 3 will still not be able to avoid losses of area of community interest and populations of species which are not of community interest.

Option 3 is also more effective than option 2 in actually increasing the provision of environmental benefits (regulation of water flows, water purification, carbon storage and sequestration, temperature control) across the board.

Under this option, green infrastructure elements are not only created thanks for the increased in funding (option 2) but green infrastructure is also better preserved. This option therefore delivers significantly higher biodiversity benefit thanks to preservation of the stock and improvement of the quality of elements which are valuable for biodiversity conservation and the provision of key ecosystem services

### ***Socio-economic dimension***

As in option 2, additional jobs are created by the increase in investment in restoration of green infrastructure elements. Investments in ecosystem based solution to flood management and climate mitigation and adaptation might crowd out some jobs in sectors which would have offered to pursue the same objective through alternative (grey) solutions but the net effect is neutral. In addition, a small increase in jobs is thought to result from the additional number and wider scope of impact assessments which have to be carried out and an increase in mitigation and off-setting measures.

Health benefits and education, both still on the decline compared to the reference point under option 2, show notable improvements under option 3 compared to both the baseline and the baseline scenario (BAS/ Option 1). This is in particular linked to the increase in number (wider scope) and quality of implementation of the revised EIA/ SEA Directives.

The amenity value of a whole range of multifunctional zones (outside urban areas) is preserved and in some places strategically enhanced, thus increasing their attractiveness for recreation and tourism (including from overseas) and educational purposes, in particular due to a better conservation of urban and peri-urban green infrastructure and the conservation and enhancement of green infrastructure which have a high biodiversity value.

### ***Option's acceptability and cost***

#### ***Economic dimension***

These options results in higher overall costs than the baseline scenario, but some categories of costs decline compared both to the reference point and the baseline scenario. This is particularly true for the costs resulting from ecosystem degradation and loss of their services under the other scenarios. Additional financial costs to the private sector (but also to a certain extent for public authorities) come from the increased requirement from the EIA/SEA. Additional resources will also need to be available by public authorities which are expected to witness and significant increases in administrative and financial costs from more data collection and reporting on green infrastructure (mapping), increased transparency and public participation (in spatial planning and EIA/SEA).

This is however to a certain extent compensated by the fall in some other costs recorded in the business as usual scenario. Indeed, the recurrent cost associated with the provision of services in replacement of ecosystem services lost is significantly reduced, as is the cost of maintaining the ecologic quality of protected areas (compared to the baseline).

The conversion of some land to sustainable use zones suggests a decline in provisioning services compared to the reference point, although the sustainable management of the land resources is thought to provide benefits in the range of billions in the long run, compared to the baseline scenario (BAS/option 1).

### ***Governance dimension***

With option 3, clarity and consistency as well as understandability are clearly improved, both in comparison with the baseline scenario and option 2. The legal revisions, in particular those increasing reporting requirements, contribute to a slight improvement in the practicability and enforceability compared to the BAS and option 2. On the downside, option 3 loses a bit in terms of political acceptability as much of the benefits associated with a voluntary approach in option 2 get lost with option 3.

### ***Synergies / trade-offs between the different measures /components of the option***

The different measures included under option 3 mutually reinforce each other. The effectiveness of the measure under option 2 is significantly increased when combined with the measures under option 3. The benefits from green infrastructure implementation under this option result in measurable improvements in the area of biodiversity and ecosystem services, in particular in the area of regulating services and human health. This results in cost savings which are proportionate with the additional financial means that have to be made available for the implementation of this option and some additional opportunity costs which it results in. Overall, this option is clearer, more consistent and while it might result in some resistance, the notable benefits make it overall an acceptable option, especially since improved enforceability ensures that all MS participate in the effort.

### ***Identification of impacts foreseen which could be felt as early as 2020***

It is likely to take until around 2020 for all jobs associated with the revision of the EIA and SEA Directives to be created. As the EIA revision may take place earlier than the SEA Directive, the benefits associated with its wider application would already reflect by the end of 2020 in a better state of the stock of green infrastructure across most elements compared to the baseline and option 2. This is also in part due to the climate and biodiversity proofing of EU funding. Together, these changes have allowed reducing the loss of key green infrastructure elements as early as 2020 and could have achieved, in some places, notable biodiversity and ecosystem benefits compared to the BAS.

**Table 4.2: Synthesis: overview of impacts associated with implementation of option 3**

	Reference Point <i>(see section 2.5 for more detail)</i>	Option 3
<b>General Issues</b>		
Addressing the problem/challenge -	Not sufficiently. Loss ongoing (with some exceptions e.g. Natura 2000)	GI increase with only limited new losses, most of it with stable quality



biodiversity & ESS loss <sup>4</sup>		↗
<b>Environmental Issues (synthesis)</b>		
Biodiversity & Habitats	Significant biodiversity benefits from existing green infrastructure	Some losses but reduced, important gains for some species/habitats ↗
Overall coherence and resilience	Limited connectivity undermining effective coherence and reduce resilience	Overall, small increase in resilience ↗
Provision of other environmental benefits (water and climate)	Significant range of very important benefits (provisioning, regulating, cultural and supporting services)	Stable increases, limited new losses ↗↗
<b>Economic Issues</b>		
Administrative costs (at EU and MS level)	Core area (N2K): 5.8bn/year Other areas un-estimated	↘↘↘ Magnitude: Tens of millions
Financial costs (one-off)		↘↘↘ Magnitude: Tens of millions
Financial costs (recurrent)		↘↘ Magnitude: Couple of millions/Year
Opportunity costs		↘↘↘ Magnitude: Tens of millions
<b>Social Issues</b>		
Number/quality of jobs; economic activity generated	GI and its services an important foundation for the economy and livelihoods	Notable creation of new jobs with no major losses ↗↗
Health benefits/quality of life	Important benefits	Small increase ↗
Recreation & tourism	Important benefits	Potential maintained and in some areas increased ↗↗
<b>Other issues: Good governance / Practicability and Enforceability</b>		
Practicability	n/a	Feasible but requires political will ↗
Enforceability	n/a	More reporting and data available ↗↗
Acceptability	Some lack of coherence; important public goods losses	Straightforward and effective ↗
Clarity, consistency & understandability	Insufficient integration and 'joined up thinking'	Notable enhancement ↗↗

<sup>4</sup> ie halting the loss of biodiversity and ecosystem services in Europe. This question looks at whether the design of the option actually addressed the real problem – in the sense of focus rather than effectiveness. Hence it is the intention and targeting of the option that is assessed here and not its effect.

## 5 OVERALL ASSESSMENT OPTION 4

### 5.1 Impacts of option 4 on the environmental dimension

**Table 5.1: Overview effects of option 4 on GI elements and their benefits by 2030** (arrows and %ages relative to reference point)

	Core areas	Restoration zones	Sustainable use/ Ecosystem service zones	Green urban and peri-urban areas	Natural connectivity features	Artificial connectivity features	SHORT RATIONALE/ EXPLANATION
<b>Overall stock</b>	↗↗↗ +25% (mainly marine)	↗↗ +15%	→	↗ +10%	↗ +10%	↗ +10	The need imposed by the GI Framework Directive to ensure ecosystems are resilient / coherent would, together with binding 15% target, stimulate some increase in the extent of core areas, and in restoration activities. Binding no-net-loss with strategically placed offsetting / habitat banking could contribute to restoration and improve the quality of sustainable use, urban areas and natural connectivity features. The need for artificial measures would decline, compared to the baseline, if habitats become more resilient and better connected.
<b>Ecological quality of the stock</b>	↗↗↗ +25%	By definition all are expected to improve	↗ +10%	↗ +10%	↗ +10%	→	

Overall expected impact from combined elements on ecosystem resilience and biodiversity		SHORT RATIONALE/ EXPLANATION
Area of habitats of Community interest	→	Requirement for no-net loss from developments should halt many losses, some losses would still occur from eg agricultural abandonment, but these could be compensated for through restoration target, so overall area likely to remain approximately stable.
Condition of habitats of Community interest	↗↗↗↗ +75%	Most delivered through existing g HD measures, but need to ensure resilience should further stimulate improvement.
Population status of species of Community interest	↗↗↗↗ +50%	Populations would be expected to increase as a result of strong measures within the Natura network, and weaker measures outlined above to maintain and restore habitats in the wider environment, together with reduced fragmentation, should provide significant benefits for many species that have significant populations outside Natura sites; but some pressures would remain from external and international impacts (eg climate change, hunting on migration etc), which might limit recovery of some species.
Population status of other species	↘ -10%	Measures outlined above to maintain and restore habitats in the wider environment, together with reduced fragmentation, and no loss requirements should provide significant benefits for many species; but some pressures would remain from external and international impacts (eg climate change, hunting on migration etc) so some further declines likely
Ecosystem resilience	↗↗ +20%	Overall increases in habitat area, ecosystem condition and reduced fragmentation would significantly increase resilience

Overall contribution from combined elements to provision of other environmental benefits		SHORT RATIONALE/EXPLANATION
Regulation of water flows	↗↗↗ +25%	The mainstreaming of the no net loss/ net benefits gains principles means that not only the benefits from options 1 and 2 are conserved, but the payment for ecosystem scheme that is put in place as well as the rather strict application of the no-net-loss principle (coupled with the habitat banking scheme) means that even more efforts result directly or indirectly in less water regulation benefits being lost.
Water purification	↗↗↗ +25%	The establishment of a European Payment for Ecosystem scheme means that incentives for landowners to manage their land so as to maximise its water purification potential will increase slightly. In addition, increased investment security triggered by the legal instrument likely to lead to increased private financing into GI providing the service. Hence an additional increase compared to option 3.
Carbon storage	↗↗	The EU wide Habitat Banking scheme means that the no net loss/net benefits gains principles can be implemented

<b>and sequestration</b>	<b>+15%</b>	particularly effectively when it comes to carbon. A European Payment for Ecosystem Services System particularly for forests and more multipurpose management of agricultural land (including enhancing its carbon storage capacity) might further improve the sustainable management of forests and balance different demands.
<b>Temperature control</b>	<b>↗ +15%</b>	This option does not create new opportunities to increase local temperature control beyond option 3.

## 5.2 Impacts of option 4 on the economic dimension by 2030

Economic Issues		Comments
Administrative costs (at EU and MS level)/yr	<p>↘↘</p> <p>Magnitude: Couple of millions €</p>	The establishment of a permanent expert group will be a bit more costly than the OMC. Some more administrative capacity will be required for the management of the EPES, the EU TEN-G and the EU-Wide offsetting scheme. The actions now required from all MS means that administrative capacity to ensure implementation of the Directive will need to be guaranteed in the MS, leading to a limited extent of additional costs.
Financial costs (one-off)/yr	<p><b>Public gross</b></p> <p>↘↘↘↘↘</p> <p>Magnitude: billions €</p>	Public expenditure on GI would be very large (Though with important social and other returns – picked up in other criteria). At a gross level this would be in the billions of Euros.
	<p><b>Public inv. net:</b></p> <p>↘↘↘↘</p>	TEN-GI would represent very major new up front costs.
	<p><b>Public: Admin</b></p> <p>↘↘↘</p>	Public cost –eg via use of CP, CAP related funds, EFF are not likely to be net additional, but reallocation so arguably no additional financial costs overall.
	<p><b>Private:</b></p> <p>↘↘↘</p>	In a wider range of cases EIA and SEA assessments will have to be carried out. This results in some additional private costs for new developments (and likely reduced social losses – see benefits).
Financial costs (recurrent)/yr	<p>↘↘↘</p> <p>Magnitude: tens of millions €</p>	Public admin: The one off-costs associated with the establishment of the above mentioned institutions or bodies will be slightly more important than these costs under previous options.
Opportunity costs/ yr	<p>↘↘↘</p> <p>Magnitude: tens of millions €</p>	This options will impose additional costs, the rather ambitious measures foreseen in the Strategy will mean high recurrent costs linked to the general cost of protecting, enhancing GI, to meet rather ambitious targets etc. The TEN-G fund will not replace some existing funding but most probably have to draw on new funding - hence slightly higher financial costs to public authorities. Gains will be public but not the same public.
Natural Resources (crops, wood, fish)/ yr	<p><b>Short term</b></p> <p>↘↘↘↘</p> <p>Magnitude: hundreds of millions €</p>	Potential binding targets in the area of restoration and regarding fragmentation linked to no net loss criteria might lead to an increase in opportunity costs. This might be offset in part by private opportunity gains via the PES - given that the PES scheme would be voluntary, ecosystem service providers would generally only decide to change their practices when opportunity costs outweigh the benefits.
		As per Option 3, the integration of GI for the benefits it delivers will result in some cases to a conversion of land uses or in a diversification of its uses to account for the additional benefits that it could yield which are thought to be of more value combined than if the land was only used for provisioning services. Similarly were an EU PES scheme developed, substitution of activities would increase. This would results in a decrease in the overall

	<b>Long term</b> <b>↗↗↗↗</b> <b>Magnitude:</b> <b>Billions of €</b>	<p>amount of “natural resources” produced in the short term, in particular some provisioning services decline. As this is however thought to potentially result in a small increase in prices for such products, this is not expected to lead in important income losses for producers. In the longer term (by 2030) some provisioning services are expected to increase significant (such as fish stocks).</p> <p>The long term value of improved natural resource management likely to be critically important (issue also to be picked up in benefits).</p>
Land and Property values (by 2030)	<b>↗↗</b> <b>+5%</b>	<p>Property values increase in urban areas thanks for measures under option 2 and the PES-scheme under this option ensures that the value of agricultural land or potential development land that has been ‘converted’ to green infrastructure does not decline with the small fall in agricultural productivity (indeed would increase due to PES in certain areas) and other constraints imposed with regard to management of the land. Also, the value of agricultural land elsewhere may increase if productivity of some land declines.</p> <p>Management strategies on agricultural land which would remain in use but managed more sustainably would likely lead to avoided soil erosion and thus stabilise productivity overtime, hence leading to important gains in the longer term.</p>

### 5.3 Impacts of option 4 on the social dimension (including jobs) by 2030

Social Issues		Comments
Investment and Employment: Number/quality of jobs; economic activity generated	<b>↗↗</b> <b>+15%</b>	On top of the positive developments linked to the implementation of the measures foreseen under option 2 and 3, the establishment of an EU-wide GI offset scheme creates a whole new (although small) sector with a variety of jobs linked to the functioning of the scheme and the actual offset projects. The establishment of the EPES system helps preserve livelihoods and jobs in the wider countryside.
Health benefits and well-being/quality of life (air quality, accessibility for exercise and amenity)	<b>↗↗</b> <b>+15%</b>	Most municipalities incorporate no net loss principles of GI in their spatial planning, very much as recommended in the toolkit for spatial planners (option 2 +4), with many implementing programmes for the strategic creation of GI and offering tax incentives to e.g. the creation of green roofs. EIA and SEAs are more responsive to the benefits of GI (option 3). The EU-wide GI offset schemes and EPES (option 4) offer opportunities for funding for creation and management for GI for its benefits.
Tourism and Recreation	<b>↗↗</b> <b>+15%</b>	The quality of the European countryside is not only preserved thanks to measures under option 2 and 3, it is actually enhanced strategically thanks to the establishment of the EU-wide offset scheme and the EPES. The European countryside recovers from decades of intensification of land use and uncontrolled urban sprawl in pursuit of single objectives (housing, increasing agricultural productivity etc.) - it progressively becomes more attractive for recreation and tourism, both for visitor who live in urban areas and tourists from abroad.
Education	<b>↗↗↗</b>	Thanks to the commitment to no-net loss of GI and its implementation at all levels of governance, down to the local level in most municipalities, almost

	<b>+25%</b>	no urban GI is lost and when some is lost it does not go uncompensated. Off-setting in urban areas is often used to improve the quality of the overall urban GI. Indeed, GI often created with its multipurpose function in mind, offering benefits for recreation and health benefits but also for biodiversity benefits, thus increasing even further the educational value of GI. The improved quality of GI in the wider countryside leads to a high educational value of the overall GI (both in urban areas and across the wider countryside).
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#### 5.4 Impacts of option 4 on overall governance by 2030

Other issues: Good governance / Practicability and Enforceability		Comments
Practicability	↘	This option requires initially quite important institutional innovations which could rely on existing experiences only to a limited extent. While theoretically appealing, important challenges may be linked to the implementation of some of the changes foreseen.
Enforceability	↘	A very high level of commitment and buy-in from all MS and institutions resting on a high consensus around the need for a very ambitious approach is a prerequisite to successful enforcement of the changes under this option.
Acceptability	↗	While this option is fully understandable due to its consistency it may face some resistance by those who see, in particular in the short term, a lack of consistency with a commitment to full maximisation of short term opportunities for growth.
Clarity, consistency & understandability	↗↗↗↗	Response proportionate to the challenge. Overall principles made explicit and consistently reflected and implemented across EU policies.

#### 5.5 Synthesis overview of impacts associated with option 4

Table 5.2 below provides a synthetic overview of the environmental, economic, social and governance impacts associated with the implementation of option 4. The most striking features of the outcome of this option compared to the reference point and the baseline scenario (BAU - option 1) are:

##### ***Option's overall effectiveness:***

##### ***Environmental dimension***

Option 4 is the most ambitious, demanding and wide ranging option and would have the greatest effect in enhancing the area, quality and connectivity of green infrastructure in the EU. The no net loss requirement should stem the loss of green infrastructure, while the requirement for strategies and targets at Member State level should lead to a planned and co-ordinated approach to the expansion, enhancement and maintenance of green infrastructure. New initiatives such as a TEN-G fund, biodiversity offsets and an EU wide PES scheme should facilitate this trend. As a result the enhanced stock and quality of green infrastructure, there should be an increase in ecosystem service delivery, particularly regulating and cultural services.

### ***Socio-economic dimension***

Option 4 will require the highest level of effort to be devoted to the creation, enhancement and maintenance of green infrastructure and should therefore create higher numbers of green jobs than the other options. The net overall effects on EU employment are more complex and depend on the macro-economic consequences of funding the strategy, as well as direct negative effects on employment in other activities such as agriculture. This option will maximise opportunities for outdoor recreation and education – as a result health, recreational and educational benefits should be greater than under other options.

### ***Option's acceptability and costs:***

#### ***Economic dimension***

Option 4 is expected to have the highest level of costs. These include the capital costs of expanding and restoring green infrastructure, the recurrent costs of maintaining that infrastructure, and the administrative costs of developing and overseeing strategies and co-ordinating initiatives at EU, national, regional and local levels. The greater protection and enhancement of green infrastructure can also be expected to result in opportunity costs, as opportunities for development may be more restricted than under other options. The economic value of ecosystem services will be highest under this option. While the value of agricultural and forestry output can be expected to be constrained in the short term, the enhancement of regulating services should help to maintain the long term viability and sustainability of provisioning services, thus maintaining the overall value of natural resources. Enhancements in green infrastructure will improve the living and working environment, and can be expected to enhance property and land values, at least in the vicinity of green infrastructure improvements.

#### ***Governance aspects***

Option 4 is the most demanding, wide ranging and costly option and therefore faces challenges than with regard to its political acceptability, practicability and enforceability. It offers a clear, comprehensive and consistent approach to green infrastructure policy at EU, national, regional and local levels. The development of new economic and financial instruments (TEN-G fund, offsets, PES schemes) should enhance the practicability of delivering green infrastructure strategies, though Member States will continue to rely on a range of funding instruments at different levels.

### ***Synergies / trade-offs between the different measures /components of the option:***

The introduction of a habitat banking scheme as well as a Payment for Ecosystem service scheme, addresses some of the trade-offs (including some opportunity costs) that arise under option 2 and 3. It does however result in a high increase in other opportunity costs, which accrue to both specific groups in society and public authorities. This results in a limited practicability of this option, at least until there is more certainty with regards to its practicability and cost-effectiveness.

The introduction of a habitat banking scheme as well as a Payment for Ecosystem service scheme, addresses some of the trade-offs (including some opportunity costs) that arise under option 2 and 3. It does however result in a high increase in other opportunity costs, which accrue to both specific groups in society and public authorities. This results in a limited



practicability of this option, at least until there is more certainty with regards to its practicability and cost-effectiveness. This means that, while option 4 is probably the most coherent and would deliver the highest return in terms of benefits to biodiversity and habitats and meeting potential green infrastructure related targets and objectives under the Strategy, this success would also come at quite high cost. It would also be expected to result in challenges relating to practicability and enforceability, mainly linked to the uncertainty with regard to how habitat banking and PES-schemes would play out and how effectively they could be implemented. The limited guarantee that the positive effects would be achieved means that it would be difficult to justify the costs at this stage, before more experience has been gathered on how to design such schemes for them to work effectively. This is reflected in a rather modest level of acceptability, making the overall feasibility of this option limited in the short term, despite its high overall clarity and consistency.

### ***Identification of impacts foreseen which could be felt as early as 2020***

While the institutional developments included in this option should be finalised and become operational towards 2020, the additional impacts in terms of increased ecosystem and biodiversity benefits will primarily start accruing in the decade between 2020 and 2030, as will the additional job creation associated with the schemes. The measures implementing the no net loss scenario will take some time to be put in and implemented as well, hence some delay in achieving their full potential but already some concrete impacts in terms of reduced biodiversity loss and loss of green infrastructure elements in the MS which have been fastest in introducing the principle in their legislation.

**Table 5.2: Synthesis: overview of impacts associated with implementation of option 4**

	Reference Point <i>(see section 2.5 in main report for more detail)</i>	Option 4
<b>General Issues</b>		
Addressing the problem/challenge - biodiversity & ESS loss <sup>5</sup>	Not sufficiently. Loss ongoing (with some exceptions e.g. Natura 2000)	Offers the most comprehensive approach to GI protection and enhancement. Should halt biodiversity and ESS loss through implementation of no net loss principle. ↗↗
<b>Environmental Issues (synthesis)</b>		
Biodiversity & Habitats	Significant biodiversity benefits from existing green infrastructure	Biodiversity benefits are enhanced through protection, enhancement and expansion of GI, and improved habitat connectivity and quality. ↗↗↗
Overall coherence and resilience	Limited connectivity undermining effective coherence and reduce resilience	Comprehensive GI strategies helps enhance connectivity, coherence & resilience, especially coupled with an effective habitat banking scheme. ↗↗
Provision of other	Significant range of very important	Enhanced extent and quality of GI

<sup>5</sup> ie halting the loss of biodiversity and ecosystem services in Europe. This question looks at whether the design of the option actually addressed the real problem – in the sense of focus rather than effectiveness. Hence it is the intention and targeting of the option that is assessed here and not its effect.

environmental benefits (water and climate)	benefits (provisioning, regulating, cultural and supporting services)	enhances delivery of ecosystem services, especially regulating and cultural services. ↗↗↗
<b>Economic Issues</b>		
Administrative costs (at EU and MS level)	Core area (N2K): 5.8bn/year Other areas un-estimated	Significantly increased administrative costs at EU, MS, regional and local levels. ↘↘
Financial costs (one-off)		High capital costs of mapping, planning, expansion and restoration. ↘↘↘
Financial costs (recurrent)		High recurrent costs of maintaining GI stock and implementing GI plans and policies. ↘↘↘
Opportunity costs		High opportunity costs as this option restricts development and land management options more than others. ↘↘↘
<b>Social Issues</b>		
Number/quality of jobs; economic activity generated	GI and its services an important foundation for the economy and livelihoods	Largest increase in employment opportunities in GI expansion, restoration, protection and maintenance. ↗↗
Health benefits & quality of life	Important benefits	Greatest health benefits through enhanced living environment and access to green recreational areas. ↗↗
Recreation & Tourism	Important benefits	This option delivers greater quality of life benefits than others. ↗↗
<b>Other issues: Good governance / Practicability and Enforceability</b>		
Practicability	n/a	Most demanding and wide ranging option, therefore presents practical challenges. ↘
Enforceability	n/a	Requires substantial action at MS, regional and local level, thus presenting challenges for enforcement. ↘
Acceptability	Some lack of coherence; important public goods losses	Offers coherent and understandable approach; however, demanding nature of this policy, high costs involved and likelihood of wide ranging trade-offs present challenges regarding political acceptability. ↗
Clarity, consistency & understandability	Insufficient integration and 'joined up thinking'	Offers a clear, consistent, wide ranging and integrated approach to GI. ↗↗↗↗

## 6 SYNTHESIS

**Table 6.1: Short synthesis overview of impacts associated with implementation of options 1-4**



















	Reference Point	Option 1 - Baseline	Option 2	Option 3	Option 4
General Issues					
Addressing the problem/challenge - biodiversity & ESS loss 6	Not sufficiently. Loss ongoing (with some exceptions e.g. Natura 2000)	↘ ↘	↘	↗	↗↗
Environmental Issues (synthesis)					
Biodiversity & habitats	Significant biodiversity benefits from existing GI	↘↘	↘	↗	↗↗
Overall coherence and resilience	Limited connectivity undermining effective coherence and reduce resilience	↘ ↘	↘ ↘	↗	↗↗
Provision of other environmental benefits (water and climate)	Significant range of very important benefits (provisioning, regulating, cultural and supporting services)	↘↘	↗	↗↗	↗↗↗
Economic Issues					
Administrative costs (at EU and MS level)	Core area (N2K): 5.8bn/year Other areas un-estimated tbc	↘	↘	↘↘	↘↘↘
Financial costs (one-off)		→ of action ↘↘↘ of non-action	↘↘	↘↘↘	↘↘↘↘
Financial costs (recurrent)		→ of action ↘↘↘↘ of non-action	↘	↘↘	↘↘↘
Opportunity costs		↘	↘	↘↘↘	↘↘↘↘
Social Issues					
Number/quality of jobs; economic activity generated	GI and its services an important foundation for the economy and livelihoods	→	↗	↗↗	↗↗
Health benefits/ quality of life	Important benefits	↘↘	↘↘	↗	↗↗
Recreation & Tourism	Important benefits	↘	↘	↗↗	↗↗
Other issues: Good governance / Practicability and Enforceability					
Practicability	n/a	Unchanged. →	↗↗	↗	↘
Enforceability	n/a	Unchanged. →	↘	↗↗	↘
Acceptability	Some lack of coherence; important public goods losses	Limited ↘	↗↗↗	↗	↗
Clarity, consistency, understandability	Insufficient integration and ‘joined up thinking’	Lacking ↘	↘	↗↗	↗↗↗↗

<sup>6</sup> ie halting the loss of biodiversity and ecosystem services in Europe. This question looks at whether the design of the option actually addressed the real problem – in the sense of focus rather than effectiveness. Hence it is the intention and targeting of the option that is assessed here and not its effect.

**Table 6.2: Long synthesis table: overview of impacts associated with implementation of the different options**

	Reference Point	Option 1 - <i>Baseline</i>	Option 2	Option 3	Option 4
<b>General Issues</b>					
Addressing the problem/challenge - biodiversity & ESS loss <sup>7</sup>	Not sufficiently. Loss ongoing (with some exceptions e.g. Natura 2000)	No – significant opportunities missed; expected continued risk of loss of biodiversity and ESS ↘ ↘	The challenge is partially addressed, but insufficiently ↘	GI increase with only limited new losses, most of it with stable quality ↗	Most comprehensive approach halts BD & ESS loss through no net loss principle. ↗↗
<b>Environmental Issues (synthesis)</b>					
Biodiversity benefits	Significant biodiversity benefits from existing green infrastructure	Overall declines despite progress in some areas ↘	Still significant losses in some areas ↘ ↘	Some losses but reduced, important gains for some species/habitats ↗	BD benefits enhanced by GI stock & quality increase. ↗↗
Overall coherence and resilience	Limited connectivity undermining effective coherence and reduce resilience	Expected decline (from expected fragmentation et al) ↘ ↘	Improvements do not contribute much to increasing resilience/coherence ↘ ↘	Overall, small increase in resilience ↗	Comprehensive GI strategy + effective habitat banking scheme. ↗↗
Provision of other environmental benefits (water and climate)	Significant range of very important benefits (provisioning, regulating, cultural and supporting services)	Overall decline ↘↘	The provision of key regulating services is, at least in part, enhanced ↗	Stable increases, limited new losses ↗↗	Enhanced delivery of ESS, esp. regulating & cultural. ↗↗↗

<sup>7</sup> ie halting the loss of biodiversity and ecosystem services in Europe. This question looks at whether the design of the option actually addressed the real problem – in the sense of focus rather than effectiveness. Hence it is the intention and targeting of the option that is assessed here and not its effect.

	Reference Point	Option 1 - <i>Baseline</i>	Option 2	Option 3	Option 4
<b>Economic Issues</b>					
Administrative costs (at EU and MS level)	Core area (N2K): 5.8bn/year Other areas un-estimated	 <u>Magnitude:</u> small: Hundreds of thousands per MS	Magnitude: Hundreds of thousands 	 Magnitude: Tens of millions	Significantly increased admin costs at all levels. 
Financial costs (one-off)		 of action /  of non-action <u>Magnitude:</u> incremental costs: tens of millions/year	<b>of action</b> Magnitude: A couple of millions 	 Magnitude: Tens of millions	High capital costs of mapping, planning, expansion & restoration. 
Financial costs (recurrent)		 of action /  of non-action <u>Magnitude:</u> hundreds of millions / billions /year No additional opportunity costs	 <b>of action</b> Magnitude: A couple hundreds of thousands/year	 Magnitude: Couple of millions/Year	High recurrent costs of maintaining GI stock and implementing GI plans and policies. 
Opportunity costs		 <u>Magnitude:</u> small: Hundreds of thousands per MS			
			Magnitude: Hundreds of thousands 	 Magnitude: Tens of millions	Option restricts development & land management more than others. 

	Reference Point	Option 1 - <i>Baseline</i>	Option 2	Option 3	Option 4
<b>Social Issues</b>					
Number/quality of jobs; economic activity generated	GI and its services an important foundation for the economy and livelihoods	Limited/sub-optimal →	Overall small net increase in jobs ↗	Notable creation of new jobs with no major losses ↗↗	Largest increase in employment opportunities in GI expansion, restoration, protection and maintenance.↗↗
Health benefits/ quality of life	Important benefits	Decline from loss of air pollution regulation services / access to nature ↘↘	Health benefits still on the decline ↘↘	Small increase ↗	Greatest health benefits through enhanced living environment and access to green recreational areas.↗↗
Recreation & Tourism	Important benefits	Decline from loss of access to nature ↘	Still slight decrease ↘	Potential maintained and in some areas increased ↗↗	This option delivers greater quality of life benefits than others.↗↗
<b>Other issues: Good governance / Practicability and Enforceability</b>					
Practicability	n/a	Unchanged. →	↗↗	Feasible but requires political will ↗	Most demanding and wide ranging option, therefore presents practical challenges.↘
Enforceability	n/a	Unchanged. →	↘	More reporting and data available ↗↗	Requires substantial action at MS, regional and local level, thus presenting challenges for enforcement.↘
Acceptability	Some lack of coherence; important public goods losses	Limited ↘	↗↗↗	Straightforward and effective ↗	Coherent & understandable but demanding high costs & likelihood of trade-offs = challeng. ↗
Clarity, consistency & understandability	Insufficient integration and 'joined up thinking'	Lacking ↘	↘	Notable enhancement ↗↗	Offers a clear, consistent, wide ranging and integrated approach to GI. ↗↗↗↗

