

# Payments for Ecosystem Services (PES) Tool Review

## Ecosystem Services Tools

TABLES Project 2012: Mini reviews	
<b>Guidance</b>	<i>Using your experience and expertise, consider the following tasks in relation to the tool. It may not be possible to complete all tasks for each tool due to a lack of available information, the task not applying to the tool, etc. <b>Please note where this is the case by writing in the reason in the space provided.</b> Please use a maximum of 6 pages of A4 (excluding diagrams and appendices). <b>Your responses are required in the white spaces.</b></i>
<b>Task 1: Basic information</b>	
<b>Name of the tool</b>	Payments for Ecosystem Services (PES)
<b>Type of tool (list all that apply)</b>	Financial/economic, valuation, decision, ecosystem services
<b>Group members</b>	<ol style="list-style-type: none"> <li>1. Mark Everard</li> <li>2. Mark Reed</li> </ol>
<b>Please provide a brief synopsis of the tool</b>	<p>Paying for Ecosystem Services (PES) is a market-based approach based on creation of markets linking the 'suppliers' of ecosystem services with their 'users'/'consumers'. Some services (mainly provisioning services) are already traded, including for example fresh water and food. However, most are external to today's market, yet are crucial for ecosystem resilience and support society now and into the future (e.g. pollination and nutrient cycling). Valuation of these many formerly omitted ecosystem services is essential for their effective incorporation into decision-making, and development of PES markets offers a means to recognise, internalise and protect these valuable services.</p> <p>Some examples are provided below, but a classic example is that of water catchment protection to recognise the value of landscapes for the (provisioning) service of producing fresh water. There are now many PES initiatives worldwide wherein payments from water users (e.g. spring water bottlers or drinks companies) and/or water companies (responsible for providing clean tap water) are made to farming and other land use interests whose actions affect the provision of that service (typically taking the form of land use subsidies, capital grants and/or advisory services).</p> <p>In all cases, for an economic transaction to be considered a Payment for Ecosystem Services, it must consist of a <u>voluntary</u> contract between service providers and service consumers. Payments are <u>conditional</u> on achieving service enhancement of protection (or else actions agreed by all parties as likely to achieve that outcome), <u>additional</u> to basic regulatory requirements and would not have happened anyway, and where activities that are detrimental to the provision of ecosystem services are not simply displaced elsewhere (known as <u>leakage</u>).</p>

## Task 2: Use of the tool

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

The OECD estimated that there were 300 PES, or at least ‘PES-like’, schemes in operation globally in 2010<sup>1</sup>, and PES development has accelerated since that time. Although many pre-existing PES schemes have advanced on an ad hoc basis, DEFRA will be publishing a Best Practice guide in 2012<sup>2</sup> that formalises cyclic of stages in the development PES from concept to engagement of interested parties through to underlying research and legal issues and finally market establishment feeding back as an adaptive loop. This Guide provides case studies that show how PES schemes internationally have been used at every stage of the decision/policy-making process, though there are few examples of single PES schemes that have operated at every one of these stages. For example, the Guide starts out by describing how opportunities for PES schemes may be initiated, identifying the prospects for trade and potential buyers and sellers. In this way, PES schemes can play a major role in the ideas phase of decisions within the ecosystem approach, spawning whole decision-making processes that lead to the development and implementation of schemes. Survey and assessment is a key part of developing successful PES schemes, both in terms of assessing the market, and monitoring the benefits of operational PES schemes. PES schemes may contribute towards other decision/policy making processes, for example by providing additional incentives to help achieve policy implementation e.g. helping meet targets under climate legislation, the Habitats Directive or Water Framework Directive, if the scheme leads to carbon sequestration, habitat restoration or improvements in biodiversity, or improvements in water quality respectively. Monitoring data required for PES schemes may also prove useful in evaluating decision/policy making processes.

## Task 3: Existing literature about the tool

<p><b>Are you aware of any KEY policy and / or academic literature evaluating your tool?</b></p>	<p>Please add any further comments here:</p> <p>DEFRA (2010) Payments for Ecosystem Services: a short introduction.  <a href="http://archive.Defra.gov.uk/environment/policy/natural-environ/documents/payments-ecosystem.pdf">http://archive.Defra.gov.uk/environment/policy/natural-environ/documents/payments-ecosystem.pdf</a></p> <p>Dunn H. (2011) Payments for Ecosystem Services, DEFRA Evidence &amp; Analysis Series Paper 4. <a href="http://www.Defra.gov.uk/publications/files/ecosystem-payment-services-pb13658a.pdf">http://www.Defra.gov.uk/publications/files/ecosystem-payment-services-pb13658a.pdf</a></p> <p>Engel, S., Pagiola, S., and Wunder, S. (2008). Designing payments for environmental services in theory and practice: an overview of the issues. <i>Ecological Economics</i> 65(4): 663–674. 11</p> <p>Jack, B.K., Kouskya, C. and Simsa, K.R.E. (2008). Designing payments for ecosystem services: Lessons from previous experience with incentive-based mechanisms.</p>
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<sup>1</sup> OECD. (2010). Paying for Biodiversity. OECD Publishing.

<sup>2</sup> DEFRA. (in production). PES Best Practice Guide. [Final title to be notified on production of final draft late-2012] [neat.ecosystemsknowledge.net](http://neat.ecosystemsknowledge.net)

	<p>PNAS 105(28): 9465-9470.</p> <p>OECD (2010). <i>Paying for biodiversity: enhancing the cost-effectiveness of payments for ecosystem services</i> (Executive Summary) [online] available at:  <a href="http://www.oecd.org/dataoecd/25/55/46135424.pdf">http://www.oecd.org/dataoecd/25/55/46135424.pdf</a></p> <p>Rowcroft P, Smith S, Clarke L, Thomson K, Reed MS (2011) Barriers and Opportunities to the Use of Payments for Ecosystem Services. Final Report to DEFRA,  <a href="http://randd.Defra.gov.uk/Document.aspx?Document=PESFinalReport28September2011(FINAL).pdf">http://randd.Defra.gov.uk/Document.aspx?Document=PESFinalReport28September2011(FINAL).pdf</a></p> <p>TEEB (2010). <i>The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations of TEEB</i> [online] available at:  <a href="http://www.teebweb.org/LinkClick.aspx?fileticket=bYhDohL_TuM%3d&amp;tabid=924&amp;mid=1813">http://www.teebweb.org/LinkClick.aspx?fileticket=bYhDohL_TuM%3d&amp;tabid=924&amp;mid=1813</a></p> <p>Wunder, S. (2005). <i>Payments for environmental services: Some nuts and bolts</i>. Center for International Forestry Research Occasional Paper No. 42 [online] available at:  <a href="http://www.cifor.cgiar.org/publications/pdf_files/OccPapers/OP-42.pdf">http://www.cifor.cgiar.org/publications/pdf_files/OccPapers/OP-42.pdf</a></p>
<p><b>Task 4: Your experience of working on the tool</b></p>	
<p><b>Have you done any research/consultancy work on this tool in terms of its development, testing and/or evaluation?</b></p>	<p>See DEFRA PES Best Practice Guide for multiple examples of projects that have developed and tested this approach. Members of the working group for this tool can also provide additional examples:</p> <ul style="list-style-type: none"> <li>• Mark Everard: has implemented PES schemes in South Africa (relating to water supply) and India (around ecotourism)</li> <li>• Mark Reed: is working with colleagues to develop a UK Peatland Carbon Code to support peatland carbon markets in the UK</li> </ul>
<p><b>Guidance</b></p>	<p>For Tasks 5-7, please also try to consider the <b>future</b> development and application of this tool in the TABLES project in your answers.</p>
<p><b>Task 5: Incorporating the ecosystem approach (EA) and ecosystem services (ES)</b></p>	
<p><b>Using examples (from practice, research or consultancy), explain how EA and/or ES are currently incorporated in/by the tool</b></p>	<p>When those who are responsible for providing ecosystem services are the beneficiaries of those services (e.g. in the case of many ‘provisioning’ services such as food production), private markets are likely to effectively maintain the provision of services. However, when the benefits mainly accrue to others (e.g. downstream flood protection or carbon storage) (i.e. land management is creating “positive externalities”), markets often fail to reward land managers for providing these services. Attempts to maintain or enhance these ecosystem services for the benefit of wider society, may lead to conflict where their provision is at odds with the objectives of land managers (e.g. where the opportunity costs of maintaining biodiversity compromise the economic viability of a sporting estate). On the other hand, some land uses and management activities lead to benefits for landowners and managers at the expense of wider society (in this case land management is creating “negative externalities”). Some of these negative effects may be off-site, for example, when land use exacerbates flooding or sediment loss/accumulation in adjacent areas downstream; or, there may be on-site impacts when a decision in one sector (e.g. conservation) affects another sector (e.g. agriculture).</p> <p>Various policy responses to these market failures that distort land use are possible. These may be characterised broadly as incentivising, obliging or urging peatland managers to alter their activities. Each has advantages and disadvantages, although in practice some</p>

combination of individual policy measures is typically used. Payment for Ecosystem Services (PES) offers a way to pay for the societal costs and benefits of land management (effectively “internalising” societal costs and benefits that were previously “externalised” from land managers), incentivising more sustainable management.

The benefit of a PES approach is that it turns non-paying service beneficiaries into buyers (sometimes via intermediaries who act as buyer agents for the ultimate beneficiaries), formalising the transactions that take place between those who provide and those who use ecosystem services. By rewarding land owners and managers on the basis of the services they provide to society, PES provides an explicit financial incentive to provide public goods for which they are not currently paid.

Exemplar catchment management examples are to be found in the UK ‘Thinking Upstream’ ([www.upstreamthinking.com](http://www.upstreamthinking.com)) and US ‘New York City Water Supply’ (for example as reviewed in Everard, 2011<sup>3</sup>) where land users are rewarded for their cost-effective impact on provision of cleaner water, as compared to the costs to water providers of cleaning up dirtier water downstream. Other global PES examples address protection of biodiversity (payments for conservation-relevant measures), carbon sequestration (emerging carbon markets), flood risk by adjustment of land use, access and amenity, etc. The supply and consumption of a service and its economic value is central to these PES schemes, engaging affected stakeholders in voluntary markets.

**How could the ecosystem approach and/or ecosystem services be (further) incorporated within the existing tool?**

The tool is inherently based on the ecosystem approach, addressing single or multiple ecosystem services. It is important to ensure that all services are considered, even if not part of markets, if we are not to perpetuate the current model of promoting selected services at the expense of others (as in modern agriculture or marine fisheries). As PES schemes proliferate, this may require a degree of central co-ordination and/or regulation, to ensure that markets for certain ecosystem services do not lead to trade-offs with other services that are harder to value financially (e.g. cultural services including biodiversity). An alternative approach is to “layer” schemes for different ecosystem services together, in which a single project delivers multiple services but markets them each to different buyers, or to “bundle” multiple services into a single scheme where buyers interested in a core service pay a premium for the co-benefits. In this way, it may be possible for brokers to co-ordinate markets for multiple services in such a way as to avoid trade-offs.

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

Explain how the tool can be situated within the priority questions/criteria that arose in the scoping interviews	Priority question/criteria	Does your tool address/implement this question/criteria? Or does it have the potential if it was better integrated with an EA/ES approach? <i>Please explain how.</i>
		<b>Language and communication</b>
	1. Contribution to aiding the development of shared vocabulary within which principles of EA and ES can be shared with multiple stakeholders across built	Best practice (according to DEFRA) is to engage all relevant stakeholders around a common understanding of ecosystem service linkages, as part of the design of new PES schemes. There is however limited evidence that this is routinely done, and feedback from stakeholders during the development

<sup>3</sup> Everard, M. (2011). *Common Ground: The Sharing of Land and Landscapes for Sustainability*. Zed Books. [neat.ecosystemsknowledge.net](http://neat.ecosystemsknowledge.net)

	and/or natural environment	of DEFRA's PES Best Practice Guide repeatedly focussed on problems with jargon/terminology.
	2. Capacity of the tool to develop shared understandings of the many identities and values of places from the perspectives of multiple visitors, residents and businesses	Few UK-based PES schemes directly target the public, but there is a potential to develop public-facing PES schemes based around carbon offsetting or visitor payback (see separate tool on this). DEFRA are currently exploring the potential for new digital and mobile technologies to facilitate visitor payback for ecosystem services, and such technologies may offer the potential to share understandings of different values for nature. Most UK-based PES schemes are focussed on business, but there is limited sharing of understandings of values.
	3. Capacity of the tool to improve or enable engagement across different publics so avoiding the usual suspect problem	See response to question 2.
<b>Learning from experience/pedagogy</b>		
	4. Capacity of the tool to help reveal and value 'hidden' assets that are not recognised by communities or publics that use them	Development of PES is by definition addressing ecosystem services currently outside of the market, often targeting services considered 'for free' and hence a 'hidden asset' to resource managers and helping beneficiaries recognise that they are indeed service beneficiaries
	5. Extent to which tool is building on other tools or EA/ES progress	PES is built on implementing the ecosystem approach and delivering ecosystem services, and is one of a number of market-based instruments (subsidies, taxes, etc.). Rather than building on these other policy instruments, PES is usually used alongside these other instruments. The proliferation of PES schemes is dependent upon our understanding of the ecological mechanisms that underpin ecosystem service provision, to: i) ensure payments for one service do not inadvertently lead to trade-offs to other linked services; and ii) provide means of monitoring and verifying ecosystem service delivery. For many services, more basic research is required to understand how changes in land management that could be supported by PES schemes might affect multiple services at different spatial and temporal scales. More research is also needed in many cases to provide cost-effective mean of verifying the delivery of services that have been paid for.
	6. Extent to which tool is locally derived or grounded or can be adjusted to closely reflect 'local' context. Is the tool	The development cycle shortly to be published in the DEFRA PES Best Practice Guide is of generic applicability across scales

	suitable for an open source approach?	
	7. Extent to which the tool is open to interpretation and application in a variety of forms (that reflect 'cultural' differences)	The development cycle, shortly to be published in the DEFRA PES Best Practice Guide, is of generic applicability across scales.
<b>Developing and selecting tools</b>		
	8. Is the tool dependent on a specific funding source? How onerous is the application procedure? What are the chances of success?	PES development is explicitly market creation for mutual advantage between beneficiaries and providers of services. However, development costs can be high, as can transaction costs (though these should be minimised in design on a 'principle of parsimony' basis) so additional development support is advantageous. Funding can come from multiple buyers, spreading risks and enhancing the resilience of schemes to future changes in the availability of funding.
	9. Does skills development (essential or optional?) and support exist for the tool or is there a body to ensure the optimal and correct use of it?	See reference to various guides (task 3). The UK's Ecosystems Knowledge Network <sup>4</sup> will host DEFRA's PES Best Practice Guide and other useful materials linked to PES, and will act as a learning and support network for PES in future
	10. Extent to which current statutory hooks can be exploited by the tool or will benefit the quality or application of the tool (e.g. NNPF's duty to cooperate, SUDS, ecol. networks)	PES development is part of commitments under the UK White Paper on the Natural Environment, <i>The Natural Choice</i> <sup>5</sup> has a strong emphasis on PES, and linked to this DEFRA will be launching a PES Action Plan at the end of 2012. Similarly, the Welsh Government's "A Living Wales" framework and Scottish Government's Land Use Strategy highlight PES, and seek to facilitate the development of new PES schemes to leverage private investment in the natural environment.
<b>Informing resultant policies effectively</b>		
	11. Extent to which the tool informs or improves policies/decisions. What does the tool cover? (full range of positive and negative economic, social and environment impacts / tradeoffs?)	By paying land owners/managers for ecosystem services that society enjoys but did not hitherto pay for, PES can incentivise land management decisions that sustain the provision of the ecosystem services most demanded by society. However, there is a danger that services that are in less demand (or remote locations where there is less demand for ecosystem services) are overlooked by PES schemes.
	12. How does the tool link into the	PES schemes may form a delivery mechanism for

<sup>4</sup> [ekn.defra.gov.uk](http://ekn.defra.gov.uk)

<sup>5</sup> HM Government. (2011). *The Natural Choice: Securing the Value of Nature*.

[www.defra.gov.uk/environment/natural/whitepaper/neat.ecosystemsknowledge.net](http://www.defra.gov.uk/environment/natural/whitepaper/neat.ecosystemsknowledge.net)

<p>planning system (applications and processes). At what cost / extra burden?</p>	<p>carbon and biodiversity offsetting, which may become mandatory in future as part of the planning system. It may be possible for Section 106 payments or the Community Infrastructure Levy to become a source of funding for PES schemes that offset damage to the natural environment from nearby developments, and enhance benefits to local residents from the local environment. There is a reference to ecosystem services as a basis for consideration in the NPPF.</p>
<p><b>Delivering management objectives</b></p>	
<p>13. Suitability or capacity of the tool to assist with managing visitor needs and pressures within protected areas / the considered area? How?</p>	<p>Visitor payback schemes and charges for amenity/access can be forms of PES. Controls of visitor numbers to match carrying capacity may be included in design (i.e. through a limited number of permits, etc.). This is being investigated in greater depth via a new DEFRA PES Pilot project.</p>
<p><b>Local ownership/new governance</b></p>	
<p>14. To what extent can the tool assist in developing statutory plans (local and management plans) and improve ownership and use by publics?</p>	<p>Uncertain: it is mainly about delivery rather than planning, though underpinning consideration of service provision and requirements informing plans can then be a basis of PES development of critical services.</p>
<p>15. To what extent does/could the tool contribute to a new form of community governance in management of the environment?</p>	<p>Common land providing public benefits could readily form the basis for PES schemes (e.g. as water catchment, access and amenity, fisheries, etc.). If DEFRA Best Practice Guidance is followed in the development of new PES schemes, all relevant stakeholders should be consulted during scheme development. The level of engagement is likely to vary between PES schemes, but most of the case studies reviewed by DEFRA for its PES Best Practice Guidance suggest relatively limited engagement from stakeholders in environmental governance related to PES schemes. It is possible that in future, new PES schemes will be proposed by self-organised groups of land owners/managers who wish to market ecosystem services, which would lead to a new form of community-based environmental governance.</p>
<p><b>Improved tools: understanding flows, interconnections and spatial issues</b></p>	
<p>16. Capacity to improve spatial understandings of the flows and interactions of various ecosystem services between sectors and at different scales</p>	<p>PES links ‘providers’ with ‘consumers’ who may be local (a local green space), catchment-scale (flooding or water supply) national or global (support for charismatic biodiversity and also carbon sequestration). Much of the underpinning research required to facilitate PES schemes involves understanding these spatial links between services, so the proliferation of markets for ecosystem services</p>

		may well improve our capacity to understand these processes.
	17. Capacity of the tool to reconcile assessments of options and benefits across different scales (and sectors)	PES schemes do not necessarily have to consider benefits and trade-offs at different scales – there are many examples of small-scale PES schemes focussed on single ecosystem services. However, most PES schemes have a series of co-benefits associated with the management of the core service for which there is a market. By bundling these additional services, or “layering” multiple PES schemes that can run in parallel, there is the potential to optimise synergies and avoid trade-offs between ecosystem services at multiple scales.
	18. Extent to which the tool is capable or can be manipulated to work across sectoral and administrative boundaries	The development cycle is designed to bring consensus about common opportunities, extending across sectoral and administrative boundaries which are not respected by the flow of services.
	19. Extent to which the tool can handle data shortages and gaps (or is effectiveness considerably compromised?)	The development cycle is designed to address consensus views, in which assumptions and agreements about risk and uncertainty can be used cost-effectively to resolve data gaps. It is possible to initiate PES schemes in the absence of full information, making conservative estimates, and for the science and data underpinning transactions to advance in parallel (this happened in the development of the Woodland Carbon Code and associated projects).
	20. To what extent has/could the tool put landscape/nature conservation and designated species/sites on the radar (positively or resulting in resentment?)	PES has helped promote the value of landscape/nature conservation/other service provision to wider publics. It has the potential to make land owners/managers who operate within designated sites view these more positively, if PES schemes lead to them being paid for work they must currently undertake at their own expense to comply with the designation.

Please add any further comments here:

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

Referring back to the relevant policy and academic literature (listed in Task 3), plus your own expertise (listed in Task 4) and the way in which the tool is

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

- Links economic with social (public enjoyment) and environmental (service-producing functions) facets
- Recognises often overlooked values of ecosystems
- Develops by consensus
- Additional to legislative requirements
- Transparent
- Contractual
- Well-established globally addressing a diversity of services



<p><b>situated within the priority questions/criteria (listed in Task 6), please complete a summary SWOT analysis ensuring that each point is well justified</b></p>	<p><b>Weaknesses</b> <i>(factors that detract from the tool’s ability to deliver intended outcomes)</i></p> <ul style="list-style-type: none"> <li>• Can have high transaction costs</li> <li>• Some commentators have philosophical problems with the concept of “putting a price on nature” and object to PES on these terms</li> </ul>					
	<p><b>Opportunities</b> <i>(consider opportunities for application of the ecosystem approach and services)</i></p> <ul style="list-style-type: none"> <li>• Potential for PES development is substantial in terms of the range of services and market potential</li> <li>• The current coalition Government nationally and devolved administrations in Scotland and Wales are supportive of PES in principle, and are likely to provide the support necessary to facilitate the proliferation of PES schemes in the immediate future</li> </ul>					
	<p><b>Threats</b> <i>(factors which negatively affect the tool and its outcomes)</i></p> <ul style="list-style-type: none"> <li>• Limited knowledge/science base for some services may limit the ability to monitor service provision, which is a key precursor to the development of PES schemes. This may limit the range of new services that can be brought into PES schemes (highly likely, not very serious)</li> <li>• If unregulated, there is a danger that some PES schemes may lead to trade-offs with biodiversity, which may create “bad press” for other PES schemes (low likelihood, very serious)</li> </ul> <table border="1"> <thead> <tr> <th>Threat</th> <th>Seriousness (high, medium, low)</th> <th>Probability of occurrence (high, medium, low)</th> </tr> </thead> <tbody> <tr> <td>Commoditisation of the natural world is a potential threat if there is not common understanding about the underpinning ecosystem approach</td> <td>High</td> <td>Medium</td> </tr> </tbody> </table> <p>Please add further comments here:</p>	Threat	Seriousness (high, medium, low)	Probability of occurrence (high, medium, low)	Commoditisation of the natural world is a potential threat if there is not common understanding about the underpinning ecosystem approach	High
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Commoditisation of the natural world is a potential threat if there is not common understanding about the underpinning ecosystem approach	High	Medium				
<p><b>Guidance</b></p>	<p><i>Please now use the remainder of the document (box below) to make any general comments, observations or analyses of the tool</i></p>					
<p><b>Further comments</b></p>						