I have been asked to replace Rob Fish who was originally scheduled to speak at this workshop. I met Rob last year through contributing to a public dialogue he led on valuing nature (see slide below). The intention of the series of events of which this was part, was to introduce members of the public to the concept and framework of ecosystem services; and to elicit views on how ecosystem services should best be managed and valued.
At this public dialogue event it was clear that many of the people there could see the economic contributions to society made by what is becoming known as ‘ecosystem services’; and they could also see that in many cases the sustenance and conservation of these services required payments. At the same time, they seemed to be less comfortable with the term ‘ecosystem services’, saying for example ‘if it’s nature that you are referring to, why not keep it simple and just refer to “nature”? It seemed to be easier for people to identify with and thus to value ‘nature’, than to identify with nature framed as ‘ecosystem services’.

I think that this disquiet about framing nature in terms of ‘ecosystem services’ is worthy of attention. I’ve been asked today to put the Payments for Ecosystem Services debate into a broader critical context. That a broader critical context exists, I think in part reflects this disquiet.

As an environmental anthropologist, I consider how cultural norms, values, and discourses shape the ways that people understand ‘nature-beyond-the-human’ in different cultural contexts; and about how these frames encourage particular sorts of actions in relation to the diverse types of being that we both depend on for survival and with whom we live. In the framework of ‘ecosystem services’, culture - in the form of ‘cultural ecosystem services’ is included as a subset of ‘ecosystem services’ more broadly. So in the image here ‘cultural services’ are depicted as a subset of ‘ecosystem services’, within which there are other identified sub-services. Here these include ‘ecotourism’ and ‘recreation’, but they might also include ‘aesthetic and/or spiritual values’.

From an anthropological perspective, however, the ecosystem services framework is itself a particular way of understanding, defining and partitioning the world. It has been able to come into being, and be established as powerful, at this particular historical and cultural moment, because it is resonant in very specific ways, which I will turn to later in this talk. In other words, the ‘ecosystem services framework’ is itself embedded within culture: or at least within a particular cultural perspective that is becoming hegemonic, regarding the preferred nature of human relationships with the natural world. As such, I think it’s important to understand what this framing is encouraging and amplifying, in terms of how ‘we’ are able to define, know and value nature-beyond-the-human.
But also by way of introducing myself, and for this very cross-disciplinary audience, I’d like to add that in the course of conducting my PhD research in west Namibia during the 1990s, I spent more time than I care to remember measuring trees (around 3,000 of them) and herbaceous plants, and using the numbers arising from this for multivariate statistical analyses. I mention this by way of saying that I have some experience of what goes into ecological survey work and into representing the natural world in numerical terms, and of both the power and the limits of knowing nature in this way.

I thought it would be useful to remind ourselves of some background regarding the ecosystem services concept. You might say a very brief ‘genealogy’ - or ‘line of descent’ - of the term.

‘Environmental services’ as a way of framing nonhuman nature, seems to have been introduced in 1970 in an MIT report called *Man’s Impact on the Global Environment*, which was part of a series of ‘Studies of Critical Environmental Problems’. In this the authors urge the enumeration and evaluation of ‘environmental services’, stating that:

> It is a mark of our time, and a signal of the degree to which man is ecologically-disconnected, that the benefits of nature need to be enumerated. More important, however, is the need to evaluate each service in terms of the cost of replacing it or the cost of doing without it (including future costs that may result from the loss of additional services).


The term *ecosystem* services started to be taken up by conservation biologists in the 1970s and 1980s. The earliest reference I have found is by F. Herbert Bormann - the American plant ecologist credited with discovering acid rain. He wrote in 1976 that:

> Units of forest as small as one hectare produce an extraordinary and quantitatively significant array of goods and services beneficial to man. All of these things are done at no cost to man, on a self-maintaining basis, using solar energy.

And of course Paul Ehrlich used and popularised the term in many of his publications from the early 1980s.

At this time there was an intensified acknowledgement of the environmental impacts of industrial processes and economic growth, as well as population expansion. These were the decades where we saw various international conferences linking *environment and development* (such as the 1972 UN Conference on the Human Environment in Stockholm 1972 and associated Declaration), accompanied by encouragement of the need for economic development to be adjusted so that it is sustainable over the longer-term - as in the Club of Rome’s 1973 *Limits to Growth* report, and the World Conservation Strategy published in 1980, to which the term ‘sustainable development’ can be attributed. None of the declarations produced by these meetings use the term ‘ecosystem services’, which in part demonstrates the speed with which the term has gathered policy momentum in recent years.

In parallel with growing use of the term by conservation biologists to highlight human dependence on natural processes, ecological and environmental economists were also putting the term to work in their understanding of relationships between economic productivity and ecological sustainability. The prolific UK environmental economist David Pearce in his publications of the late 1980s and 1990s thus iterates a view of natural environments as a stock of natural capital assets serving economic functions. In both environmental and ecological economics elaborations of the correspondences between so-called natural and manufactured capitals intensify during this period, as in the statement from an ecological economics texts book that:
what natural capital and manufactured capital have in common is that they both conform to the working definition of capital as a stock … of something that produces a flow … of valuable goods or services.\textsuperscript{13}

This brief genealogy would not be complete without mention of Robert Costanza et al.’s audacious paper in Nature of 1997. This highly cited-paper (13,438 citations as of 6 May 2015) estimated the economic value of ecosystem services and natural capital at an average of 33 trillion US$ per year and, importantly, observed that \textit{most of this economic value is effectively outside formal markets}:

For the entire biosphere, the value (\textit{most of which is outside the market}) is estimated to be in the range of US$16-54 trillion per year, with an average of US$33 trillion per year.\textsuperscript{14}

This placing of monetary value on the productivity of ecosystem services has been echoed in a more recent paper by Costanza and colleagues, again emphasising that \textit{Most of the monetary value of ecosystem services is not captured in markets}. Thus:

We screened over 300 case studies on the monetary value of ecosystem services. ► The average value (market and non-market) of 10 main ecosystem types was calculated. ► The total value [based on 2007 price levels] ranged between 490 (Open Ocean) and 350,000 (Coral Reefs) Int$/ha/yr. ► \textit{Most of the monetary value of ecosystem services is not captured in markets}.\textsuperscript{15}

Of course, another key moment in consolidating a view of nature as valuable for providing of ‘ecosystem services’ for societal and human-wellbeing was the publication in 2005 of the Millennium Ecosystem Assessment\textsuperscript{16}. This overwhelmingly uses the language of ‘ecosystem services’ to describe the productivity of the natural world that is useful and necessary for human well-being.
This growing emphasis on ecosystem services is accompanied by two things that I want to highlight. The first is the extremely rapid proliferation of thinking about the natural world as a provider of ecosystem services, including the rapid incorporation of this thinking in, for example, school and university curricula, as indicated in this slide.

The second, is an also rapid shift in policy thinking from an ecosystems approach to an ecosystem services approach. I am not sure that these are exactly the same things, and this shift perhaps deserves reflection. It seems to move from a heightened ecological perspective - by which I mean an attention to the intrinsic value of the dynamic interconnectedness of species, and awareness of human embeddedness within ecosystems - as encouraged by the Convention on Biological Diversity.

The ecosystem approach:

- a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way;
- based on the application of appropriate scientific methodologies focused on levels of biological organisation which encompass the essential processes, functions and interactions among organisms and their environment;
- recognises that humans, with their cultural diversity, are an integral component of ecosystems.
- and towards an emphasis on valuing the economic outputs of the natural world for a contemporary global and industrial society, as well as the necessity of increasing the market visibility of these outputs, as urged, by the recent TEEB project on The Economics of Ecosystems and Biodiversity.\(^1\)

Payments for Ecosystem Services is a key route through which economic value for identified ecosystem services will be made both more visible and realisable in economic terms. In simple terms PES involves the following:

Delineating an ecosystem service cascade - whereby a monetary value can be placed on an identified ecosystem service attributed to conservation activity relating to primary productivity from which this service derives.\(^2\)
- and identifying consumers of a service and providers of this service, accompanied by the establishment of payments from consumers to providers, from local to international scales.  

This meets with Sven Wunder’s well-known 2005 definition of PES whereby, Payments for Ecosystem Services can be defined as a voluntary MARKET transaction whereby a well-defined ecosystem service, or land-use likely to secure that service, is being “bought” by at least one buyer from at least one provider - if and only if, the provider secures the provision of the service.

The ecosystem services framework and PES thus encourage increasing focus on assessing what nature’s services are worth in monetary terms. This is so as to increase conservation finance through measuring and costing ‘ecosystem services’, linking ‘providers’ to ‘consumers’, and thereby increasing nature’s value visibility on markets - so as to deflect conversion of ecosystems into other forms of economically valued production. But it is also encouraging an increased interest in the possibility of new income streams from ‘ecosystem services’ as newly created conservation commodities that can be traded on markets.

This impetus to make nature’s values, including monetary values, more visible, requires the application of new measurement, scoring and accounting practices to nonhuman natures: from the DEFRA biodiversity offset metric; to people in forest environments globally being made ‘ready for REDD+’ by being encouraged to measure and account for carbon in tropical forests so as to support payments from elsewhere for the environmental service of atmospheric regulation through protecting carbon sequestration.

These measurement and valuation emphases I think take us to the heart of a question identified in Clive Potter’s invitation email to me: namely, of why support and advocacy for PES as an essentially neoliberal idea has been growing in recent years?

What I want to suggest is that it is precisely because of neoliberalism - i.e. because of the specific set of policy approaches so-defining of neoliberalism - that nonhuman nature is becoming increasingly defined as a measurable stock of ‘natural capital’ generating ‘ecosystem services’, ‘that can and ought to be paid for on markets’. In other words, it is because of neoliberalism that PES and other market-based approaches are now dominating conservation and environmental policy.

Let’s unpack this a little.

Various social theorists, underpinned by the work of philosopher Michel Foucault, understand neoliberalism in a very specific way. So, for example, the German sociologist Thomas Lemke, following Foucault, identifies neoliberalism as the: ‘consistent expansion of the economic form to
apply to the social sphere, thus eliding any difference between the economy and the social.23 Further, this movement is considered to have been accompanied by the transposition of ‘economic analytical schemata and criteria for economic decision-making onto spheres which are not, or certainly not exclusively, economic areas’. In other words, neoliberalism in part is defined by the expansion of valuation techniques and criteria from formal economics into increasing areas of everyday life. And if we replace the term ‘social’ here with the term ‘ecological’ or ‘environmental’, we can see something identical happening with the rise of market-based mechanisms such as PES, as well as natural capital accounting in environmental governance.

This expansion of ‘economic analytical schemata and criteria for economic decision-making onto spheres which are not, or certainly not exclusively, economic areas’ is what permits neoliberal policies to take hold. And these policies are based on certain assumptions, namely that:

- markets are the most efficient way of allocating goods and bads;
- as such, the role of the state becomes that of managing the shift of governance functions and resources from the public sector to the private sector - of course there is enormous critique of such privatisation processes and particularly of the inequality of both income and access that this seems to enhance;
- for areas that have not previously been marketised, new units that can be quantified and monetised need to be created. We see this in spades in the environmental arena for which new units of compensation that can also be traded have proliferated in recent years;
- and since to be formally exchangeable these units need also to be alienable under property law25, their creation in many contexts both supports existing forms of land ownership (which often is very unequal, as in the UK context26) - and is also encouraging various forms of land and resource grabbing, so as to capture the new values now attached to previously non-monetised entities27.

In other words, in advocating and designing Payments for Ecosystem Services schemes it seems important to understand such schemes not simply as technical solutions to problems of environmental degradation; but also as policies embedded within a particular ideological attachment to markets that can have problematic outcomes, particularly in relation to consolidating wealth and enhancing inequality.

So I think there is a concern that whilst enormous work is going into making ‘ecosystem services’ more visible as services that can be paid for, so as to create income-streams for existing land-owners - rather less political work appears to be happening so as to reduce the multiple and interconnected forces driving decline in environmental parameters. At the same time, the natures that are created through these mechanisms - the grids of ecosystem services, the natural capital accounts, the biodiversity offset metrics - seem to further flatten perception of nonhuman nature into an inert, passive set of objects that can be well-represented by the scores, matrices and ranks that permit the creation of tradable nature units. These measures and accounts seem to be limited reflections of the experiential depth of relationships that people globally have with the diversity of natures-beyond-the-human. Indeed, these sorts of representations and calculations of nonhuman nature are so far removed from the diverse, living breathing natures they refer to, it is almost breath-taking.

To close - I have sought to respond to Clive’s request to put the PES debate into a broader critical context. My intention has been to introduce some caution regarding the neoliberal regime of truth that is increasingly determining how we define, know and manage nature.
I can’t resist by leaving you with an example of some of the worrying world-making tendencies of PES and associated market-based instruments. Just as I was preparing these slides, a co-author and friend of mine, the political scientist Bram Büscher, sent me an email with a link to a new credit card called Sustain:Green.

The website (https://sustaingreen.com/) affirms that with this credit card ‘[e]very dollar you spend … reduces your carbon footprint’ (i.e. through helping to pay for the regulating ecosystem service of carbon sequestration through purchasing carbon offsets), and that this assists with fighting climate change and preserving the rainforest. A commentator on the Ecosystem Marketplace website affirms that '[b]y using the [biodegradable] card, not only are consumers offsetting their carbon footprint but they are also helping to fund rainforest preservation without having to change their behavior much beyond choosing which card to use for purchases'.

So in this case, downstream consumers are encouraged to view the forests elsewhere simply as a source of the regulating ecosystem service of carbon sequestration, and to pay for this service via a series of intermediaries. They do not have any direct connection at all with the service providers (who are in Brazil in this case). They are also encouraged to maintain their consumption practices because it is through their purchases that they will be supporting the service of carbon sequestration. These sorts of schemes build on an ecosystem services framework but seem also to significantly distort the intentions behind this framework by:

- affirming that actors can behave in an environmentally appropriate way by simply consuming more stuff;
- and by obscuring the relationship between service provision and purchase, through inserting layers of profit-seeking intermediaries in between the payments made and the service provided.

At the same time, by understanding the ecosystem services framework and PES as very much part and parcel of the logics promoted by neoliberalism, it perhaps becomes easier to see why the conservation agenda of PES so often seems to become distorted in these ways.

I will leave you with a cartoon that seems apposite in relation to these issues, and thank you for listening…

“Yes, the planet got destroyed. But for a beautiful moment in time we created a lot of value for shareholders.”
1 After Kohn, E. 2013 How Forests Think: An Anthropology of Nature Beyond the Human. **
2 On the significance of ‘framing’ in environmental management and policy, see Lakoff, G. 2010 *
3 See, for example, Sullivan, S. 1999 The impacts of people and livestock on topographically diverse open
wood-and shrub-lands in arid north-west Namibia. Global Ecology and Biogeography (Special Issue on
‘Degradation of Open Woodlands’) 8: 257-277; Sullivan, S. and Rohde, R. 2002 On non-equilibrium in arid and
5 Ibid., p. 123.
6 Ibid., pp. 123-125.
7 Bormann, F.H. 1976 An inseparable linkage: conservation of natural ecosystems and the conservation of
8 See, for example, Ehrlich, P.R. 1982 Human carrying capacity, extinctions and nature reserves. BioScience
32: 331-333.
12 See, for example, Pearce, D. 1993 Economic Values and the Natural World. Cambridge, Massachusetts:
MIT Press.
13 Prugh, T., with Costanza, R., Cumberland, R. J. H., Daly, H. E., Goodland, R. and Norgaard, R. B. 1999
have discussed the consolidation of ‘ecosystem services’ and ‘natural capital’ as ways of framing the natural
environment further in Sullivan, S. 2009 Green capitalism, and the cultural poverty of constructing nature as
service-provider. Radical Anthropology 3: 18-27; Sullivan, S. 2014 The natural capital myth; or will
accounting save the world? Preliminary thoughts on nature, finance and values. LCSV Working Paper 3
14 Costanza, R., d’Arge, R., de Groot, S., Farber, M., Grasso, B., Hannon, K., Limburg, S., Naeem, R.,
O’Neill, J., Paruelo, R., Raskin, R., Sutton, P. and van den Belt, M. 1997 The value of the world’s ecosystem
services and natural capital, Nature 387, 253-260, p. 253, emphasis added
15 de Groot, R., Brander, L., van der Ploeg, S., Costanza, R., Bernard, F., Braate, L., Christie, M.,
Brink, P., van Beukering, P. 2012 Global estimates of the value of ecosystems and their services in monetary
units. Ecosystem Services 1(1): 50-61, p. 50, emphasis added.
Press.
17 Screenshots here are from the EU and UN TEEB project's Bank of Natural Capital website at http://
www.teeb4me.com
18 Haines-Young, R. and Potschin, M. 2010 The links between biodiversity, ecosystem services and human
well-being, pp. 110-139 in D. Raffaelli and C. Frid (eds.) Ecosystem Ecology: A New Synthesis. BES
19 See, for example, UNEP/IUCN 2007 Developing International Payments for Ecosystems Services:
Towards a Greener World Economy. www.unep.ch/etb/areas/pdf/IPES_IUCNbrochure.pdf
20 Wunder, S. Payments for environmental services: some nuts and bolts. CIFOR Occasional Paper 42,
paper/. Discussed in Sullivan, S. and Hannis, M. 2015 Nets and frames, losses and gains: Value struggles in
engagements with biodiversity offsetting policy in England. Ecosystem Services http://dx.doi.org/10.1016/
j.ecoser.2015.01.009 special issue on ‘Biodiversity Offsets as MBIs? From discourses to practice’, edited by
Froger, G., Hrabanski, M. and Boisvert, V.
22 i.e. Reducing Emissions from Deforestation and Forest Degradation in Developing Countries, http://
www.un-redd.org/
23 Lemke, T. 2001 ‘The Birth of Bio-Politics’ – Michel Foucault's Lecture at the Collège de France on Neo-
24 Ibid.

