

BANKING NATURE: ON THE SPECTACULAR FINANCIALISATION OF ENVIRONMENTAL
CONSERVATION, WITH MARX AND FOUCAULT*

Sian Sullivan

s.sullivan@bbk.ac.uk

Dept. Geography, Environment and Development Studies, Birkbeck College, University of London,
Malet Street, London, WC1E 7HX, UK

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ABSTRACT

In this paper I review several tendencies in global environmental governance towards the financialisation of environmental conservation. Finance capital, in collaboration with conservation agendas, is creating a spectacular frontier for investment in environmental conservation. This is assisted by a promise of lucrative gains, combined with creating geographical substitutability in proliferating and commodified indicators of environmental health and damage. The ensuing financialisation of environmental conservation is manifesting in two key ways: 1. the turning of banks and financiers to conservation as a locus for expansion and investment; and 2. the modelling of both conservation practice and understandings of the non-human world in terms of banking and financial concepts. I delineate four aspects of this process: nature finance, nature work, nature banking and nature derivatives. I theorise these entwined phenomena through two lenses: 1. current thinking regarding the continuous nature of primitive accumulation as initially framed by Marx; and 2. a Foucaultian analysis of the financialisation of environmental conservation as permitting the technical entraining of environmental governance to the controlling tenets of neoliberal capitalism.

KEYWORDS: financialisation, environmental conservation, primitive accumulation, frontier; neoliberalism, environmentality, carbon trade, ecosystem services, derivatives, Marx, Foucault

INTRODUCTION: FINANCE AND THE CONSERVATIONIST MODE OF PRODUCTION

A recent special issue of *Antipode* (42(3) 2010) on capitalism and conservation, introduced and edited by Daniel Brockington and Rosaleen Duffy, argues that a capitalist 'conservationist mode of production' is emerging through consolidated alliances between business and environmental conservation. While this reflects sustained effort on the part of conservation organisations to recruit business to the environmental cause, it also flows from a systemic and neoliberal¹ revisioning of environmental sustainability as a new frontier for capital expansion, with markets constructed as the realm through which environmental damage can best be mediated, mitigated and governed. The characteristics and implications of this constructed environmentality of 'Earth Incorporated' (Strong 1996), constitutes the focus of this paper.

Since a key motivation in the entrepreneurial, corporate and finance worlds is the expansionary production of surplus to sustain the acquisition and growth of capital (Harvey 1975), what is required for these sectors to be brought onto the environmental board in a structural way is that environmental concerns are reconfigured as 'a major source of revenue growth' (Hart 1997:68). 'Sustainable development', as the term that brings the notion of environmental sustainability into the arena of economic development, increasingly is presented as both 'the next industrial revolution' (Hawken, Lovins and Hunter Lovins 2008; also Hawken 1993), and as 'one of the biggest opportunities in the history of commerce' (Hart 1997:68). At the same time, successful companies and entrepreneurs now are those poised for 'selling solutions to the world's environmental problems' (Hart 1997:71). As Stuart Hart, writing in the *Harvard Business Review*, states: 'corporations are the only organizations with the resources, the technology, the global reach, and, ultimately, the motivation to achieve sustainability' (Hart 1997:67). In this logic, it clearly makes sense for those with apparent expertise in nature management to join forces with those with expertise in business and finance. Successful contemporary environmental governance thus increasingly is seen as dependent on a 'green capitalism' based on market exchange, pricing

mechanisms, private property, rational entrepreneurial individuals and capital investment (Heartfield 2008; Prudham 2009).

These developments constitute an important shift in both environmental governance and capital(ist) interest. Under neoliberalism, business frequently has been protected from the costs of environmental conservation through 'free trade' agreements that identify environmental regulation as a barrier to trade, and that may require additional legal mechanisms to protect the right to profit of investors (as documented for the North American Free Trade Agreement in McCarthy 2004).

Today, the current combination of environmental and financial meltdowns instead are being constructed explicitly as creating business and investment *opportunities* in 'sustainability'.

Brockington and Duffy (2010:480) assert additionally, however, that '[c]onservation has hardly been involved in the production of value through financialisation'. Financialisation is the process whereby finance comes to dominate other activities in the economy. In post-manufacturing economies, financialisation has come to be the primary engine of economic growth and expansion, generating accumulation through financialisation, even as other economic areas are stagnating (Bellamy Foster and McChesney 2009). In this paper I argue instead that the contexts described above are ushering in an intense and proliferating financialisation of environmental governance for conservation, combined in part with the financialisation of environmental risk (Cooper 2010). I delineate financialisation processes as taking two key forms: 1. the turning of banks and financiers to environmental parameters as a locus for expansion and investment; and 2. the modelling of both conservation practice and understandings of non-human natures in terms of banking and financial concepts.

This financialisation of environmental conservation is taking place in the context of two apparent paradoxes. First, while it would seem that recent financial crisis should signal that finance markets

had reached some sort of expansionary limit, subsequent bailouts with public money suggest instead that finance has been substantially reinforced, both in resources and in the power to command legitimising strategies by national governments (Bellamy Foster and McChesney 2009). Second, while apparent environmental crisis might be interpreted as signalling a developmental crisis of capitalism – *aka* James O'Connor's (1988) 'second contradiction of capitalism', whereby capitalism putatively undermines its own possibilities for accumulation by depleting its required material and metabolic base (also Prudham 2009 and references therein) – it is instead becoming an accumulation frontier for capitalism, precisely through relationships with finance and capital investment (Sullivan 2009). Both financial and environmental crises thus are entwined in ways that strengthen, rather than reduce, the power of finance capital.

The consequent emerging 'financialisation' of environmental crisis and protection extends 'the penetration of finance into everyday life, and above all into the reproduction of extra-human nature' (Moore 2010:390) as a key feature of capitalism in its current guise as neoliberalism. As such it has critical structuring effects in all realms of life. This paper is an attempt to both delineate and theorise some of these effects in the arena of environmental conservation for sustainability. It is structured into four remaining sections. First, I draw attention to the ways that environmental crisis and conservation are being created as a spectacular frontier for capital investment. I follow Anna Tsing (2005:57) who observes that 'the self-conscious making of a spectacle is a necessary aid to gathering investment funds' and 'a regular feature of the search for finance capital', and I detail several ways that finance capital, in collaboration with conservation agendas, is constructing such a spectacular frontier in environmental conservation. In the next section I offer a brief survey of the emerging financialisation of environmental conservation. I focus on four aspects of this process: the production of nature finance, nature work, nature banking and nature derivatives. My third section constitutes a theorisation of these entwined phenomena. I apply current thinking regarding the continuous nature of primitive accumulation as delineated by Marx, to explain the impetus towards

investment in the new frontier of environmental conservation and to theorise its likely effects. I follow this with a Foucaultian analysis of the current financialisation of environmental conservation as permitting the technical entraining of environmental governance to the controlling tenets of neoliberal capitalism. I close with a brief conclusion.

CREATING THE SPECTACULAR NEW FRONTIER OF ENVIRONMENTAL CONSERVATION

For capitalism to 'operationalise' the accumulation opportunity of environmental crisis and conservation, products and commodities connecting these domains need to be created that permit new investment, trade and speculation. Nature needs to be 'capitalised' and 'capital ecologized' in new ways (M O'Connor 1994:126, 133). Or, to paraphrase Morgan Robertson (2006:368), capital needs to create new natures that it can see. This requires that the earth-in-crisis is rethought and reworded such that it is brought further into alignment, conceptually, semiotically, and materially, with capital. The ensuing attraction of financial investment in the creation of both new products and new markets for the profitable exchange of these products, requires the spectacular creation of an investment frontier.

Tsing (2005), in her notion of 'the economy of appearances', outlines various ways in which investment frontiers are created. She notes that they are made real through the productive use of spectacle, requiring combinations of dramatic performance, as well as of conjuring tricks in the opening up of unforeseen possibilities. As she states, 'the more spectacular the conjuring, the more possible an investment frenzy' (Tsing 2005:57). Through a potent mix of abstraction and dramatic appearance it is as though the whole world is made 'ready for investment' (Tsing 2005:74). Speculators conjure potential to create commodity bubbles attractive to investors, which although often based on multiple layers of product abstraction can have significant social and material effects. The spectacular frontier of environmental conservation is no different. Here I highlight three

mutually reinforcing mechanisms of its creation.

First, are the repetitive utterances of the spectacular financial returns deemed possible through the exchange of new environmental conservation products. Statements abound of the spectacular promise of new markets in products intending to signify environmental degradation and conservation, in terms of returns to both investors/traders and to 'the environment'. The mitigating trade in carbon, for example, designed to help reduce the climate change impacts of global CO₂ emissions, is already, and is proclaimed to become, extremely lucrative. The environmental consultancy firm Advanced Conservation Strategies thus states on its website that '[b]y 2030, Carbon will be the largest commodity market in the world: \$1.6-2.4 trillion, about the same as the current oil market'.² Since Robert Costanza and colleagues (1997) famously estimated the annual value globally of 'ecosystem services' to be \$16-54 trillion, statements affirming nature's dollar value have proliferated. Extrapolating from one highly valued wetland in the US to the country's 51.4 million acres of freshwater forested wetlands, for example, produces a mouth-watering figure of \$1.7 trillion (in Plummer 2009).

Such statements now are accompanied by an equally proliferating array of assertions of the returns that might be gained if this nature value is captured through pricing and the creation of exchangeable nature products, such that these are brought into commodity markets designed to service the exchange of these products (discussed further below). The promise of this new equation of nature with money is marked by the proliferation of powerful images depicting nature as money. The logo of the United Nation's Environment Programme's (UNEP) current New Green Deal initiative, for example, is a delicate young green plant, shooting up from a pile of Euro coins.³ This echoes an earlier UNEP and IUCN (International Union for the Conservation of Nature) document on payments for ecosystem services (PES) which features an image of verdant green foliage amongst which various currency notes appear as 'leaves' (UNEP/IUCN 2007:2). The logo of a 2009

World Resources Institute report entitled *Banking on Nature's Assets* is of the earth depicted as a piggy-bank, receiving notes of various currencies (Ranganathan, Irwin and Procopé Repinski 2009). Bombardment by text and images displaying a unitary discourse that nature's value can be adequately captured through application of money's signs is a powerfully manipulative means of marketing, and thereby bringing forth, this 'reality'.

This constitutes the opening of a new frontier. In this case, it is based on establishment of the conceptual and apparently lucrative possibility of transforming measures of nature health and degradation into prices and subsequently into profitably tradable commodities. For this fledgeling frontier to grow, i.e. to attract more interest and investment, it needs to become pregnant with promise. In the financialised world of environmental conservation, this second aspect of frontier creation is constituted by the conjuring of a spectacularly proliferating range of new products and trading possibilities, based on unforeseen abstractions of the non-human world and the consequent opening up of new niches for investment. Key to this is the infinite substitutability posited by the notion of a global environment that can be essentialised into new definable and exchangeable parts, permitting offsetting trades in newly commoditised measures of environmental health and degradation.

There are two key interconnected routes through which this is done. First, is the creation of increasingly derived tradable products through the addition of layers of abstraction to commoditised signifiers of nature health and degradation (in a process akin to the creation of financial derivative products, on which more below). Second, is the constructing of tradable equivalence between previously non-exchangeable products and distant localities. This conceptual mechanism releases any brakes on the creation of environmental conservation products that can be traded between localities. Combined with the promise of lucrative returns, this is the keystone of the frontier of accumulation possibilities now constituting market-based approaches to environmental

conservation. As Tsing (2005:85) argues, such mechanisms of abstraction successfully create a 'global dream space' that is conceptually open for the entrance of finance in multifaceted ways.

Until very recently, for example, the possibility of an emerging global trade in carbon emissions, would have seemed strange and surreal. This has now become entrenched and familiar. The market trade in carbon manifests in various ways, significant ones being: 1. trade in the 'free gift' (M O'Connor 1994:140) to industrial emitters of government allocated emissions quotas (i.e. 'carbon credits') (e.g. under the European Union Emissions Trading Scheme (UE ETS)); and 2. purchase of standing biomass (normally in the global south), which, under expansionary carbon accounting practices, increasingly is becoming conceived as carbon 'sinks' for the voluntary 'offsetting', or dumping, of emitted carbon produced elsewhere (Bumpus and Liverman 2008). Within the international policy frame that opens the possibility of this trade (the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC)), work to create and stake claims to this commodification has been conducted by '[b]rokers, consultants, carbon procurement funds, hedge fund managers and other buyers', who have 'scoured the globe for opportunities to buy credits associated with projects that reduce emissions in developing countries' (World Bank 2006:35-39 quoted in Bumpus and Liverman 2008:134). A recent paper in *Conservation and Policy* thus states that 'the acquisition of carbon offsets will be the biggest financial investment in the environmental sector to date' (Bekessy and Wintle 2008:510); and current heat over the programme for Reducing Emissions from Degradation and Deforestation (REDD+) administered by the UNEP, is indicative of policy and business excitement over the potentially lucrative linkage of carbon offsets with the carbon stored in standing biomass (see www.un-redd.org; Peskett, Huberman, Bowen-Jones, Edwards and Brown 2008; also critical analysis in Böhm and Dabhi 2009; Corbera and Brown 2010; Phelps, Webb and Agrawal 2010). An accompanying array of derivative products increases possibilities for greater financial returns on this trade, extending its reach into the complex and intractable realm of 'mad money' (Strange 1998) associated with derivatives trading, hedge

funds and futures markets. Stock exchanges existing only to service trade in carbon products now exist in London (www.ecx.eu) and Chicago (www.chicagoclimatex.com), and are emerging in Montreal (www.mcx.ca), China (www.chinatcx.com.cn), and Australia (www.envex.com.au). The organisation running these exchanges, Climate Exchange Plc (www.climateexchangeplc.com), is itself a company whose shares are listed and traded on the London Stock Exchange.

This proliferating trade in carbon products naturalises an idea critical for enhancing opportunities at the conservation frontier. This is of the *equivalence* and *substitutability* of very different ‘things’ and ‘environments’, via essentialising reductions to a defined environmental measure, in this case the element of carbon. The carbon offset trade conceptually enables carbon production as one thing (e.g. industrial emissions) in one location, to be ‘offset’ against its storage in another qualitatively different thing (e.g. tropical forests) in another location. Through this the earth becomes conjured as a carbon matrix in which all production and activity is reduced to the concentration and exchange of the element of carbon. This innovation permits unintuitive confluences, as well as having profound implications for geographies of place. As Bumpus and Liverman (2008:131) note, ‘the commodification of carbon has led to the creation of new markets that eliminate spatial constraints that are associated with distances, institutions, borders, and emissions reductions’.

The possibility of using market exchanges to offset environmental damage in one location through investment in some measure of environmental conservation or restoration in another location, is now a feature of global environmental governance, with equivalent and accompanying offset trades emerging in additional measures of biodiversity and habitat health. These are being pursued in collaborations between corporations and major environmental organisations, to facilitate emergence of an array of new voluntary environmental offset commodities and exchanges. The mining conglomerate Rio Tinto, for example, is working with Environmental NGOs (ENGOs) in Madagascar to create biodiversity offset schemes whereby the impacts of mining in one location

will be 'paid for' by investing in biodiversity conservation in a different location (Seagle 2010). As such, biodiversity offsets bring what has been termed 'the ultimate anti-commodity', i.e. biodiversity, into the mitigation *banking market* (ten Kate and Maguire 2008:21; also Bayon 2008a), such that 'clearing of native vegetation may be allowed if offsets are established elsewhere in the landscape' (Bekessy and Wintle 2008:511). Ecologically then, these are designed to enable habitat loss through extractive industry. Geographically, they constitute a radical discounting of place-based specificities. What they do permit is a bringing forth of proliferating layers of possible finance accumulation through the bundling together of different environmental products that, as they are distinguished and capitalised, can begin to be banked, offset and traded in combination with each other. Bekessy and Wintle (2008: 510) make plain this opportunity in suggesting that carbon offsetters (i.e. investors in carbon sequestration landscapes), might also accrue biodiversity credits 'when the biodiversity benefits of a carbon-sequestration project can be demonstrated'.

The third impetus in creating the frontier of environmental conservation investment is accompaniment by spectacularly dramatic performances and mediated presentations: of environmental crisis, of the nature treasures that require conservation, and of conservation performance. These combine to create an environmental and conservation spectacle that both sets the scene for investment in environmental conservation, and acts to engender particular human and non-human natures as well as relationships between them (cf. Debord 1967; also the rich work by James Igoe on this theme, e.g. Igoe 2010, forthcoming; also Igoe, Neves and Brockington 2010; K. MacDonald in press). The lucrative and proliferating investment frontier of trade in environmental conservation products thus is set against, and justified through, spectacular marketing of nature loss and value, and of conservation endeavour and conservationists (Smith, Verissimo and MacMillan 2010).

The recently released film 'Hotspots', made by Conservation International under the direction of

celebrity conservation biologist Russell Mittermeir, illustrates this production of conservation as spectacle (also see Sullivan in press).⁴ The trailer spectacularly dramatises conservation work, using tropes of treasure, rarity and the exotic in signifying global localities of high biodiversity; and of crisis and threat in specifying the urgency of conservation work.⁵ This sets the scene for the entrance of the story's leading actors. These are the heroic, predominantly white and male, conservation biologists, whose work is a military-style operation featuring long lensed cameras, helicopters, camouflage fatigues, a racy soundtrack and machismo. The cinematic experience that is generated is similar to that of Hollywood portrayals of contemporary US military engagement in 'Third World' frontiers, echoing, for example, *Apocalypse now* (Vietnam) and *Black hawk down* (Somalia). The trailer closes with a deep male voice-over describing the protection of hotspots as 'the mother of all wars'. At the same time as fighting to protect nature's treasures, CI is systematising its productive collaborations with corporate and finance worlds. It is run by a board of directors consisting largely of CEOs and other representatives from these worlds.⁶ It works with business and finance⁷ to seek offsetting solutions for industrial impacts in particular locations, as well as to realise conservation capital through monetising lands owned or purchased that exhibit newly priced 'ecosystems services' (Bishop 2008; K MacDonald 2010; also see C MacDonald 2008). Little, if any, mention is made of displacements of the cultural and linguistic diversities aligned with many of the same biodiversity 'hotspots' (Loh and Harmon 2005) that now are so spectacularly associated with CI's work and mission: diversities of people and relatively low-impact livelihoods that also are under obscene threat from the forces that make conservation work at these frontier locations both necessary and possible (Sullivan 1999, 2006; Brockington and Igoe 2006; Tsing 2005). The dramatisation of natural history, environmental crisis and capitalist conservation endeavour, is further performed and *orchestrated* through spectacular events such as at the four-yearly IUCN World Conservation Congress (see analysis in K. MacDonald in press) and the biannual Wildscreen natural history film festival in the UK (see analysis in Brockington 2009). At these meetings, corporate-conservation networks and empowered understandings of conservation

issues and interventions are produced and reinforced.

As with any frontier of capital expansion, this created spectacular frontier of environmental conservation is making possible the penetration of finance into the ensuing new spaces for investment. It accompanies and is accompanied by a modelling and conceptualisation of nature using banking categories to produce a proliferating range of new nature products that can be easily aligned with finance. I outline these entwined components of nature's financialisation in the following section, focusing on the categories of nature finance, nature work, nature banking and nature derivatives.

BANKING NATURE

Nature Finance

The movement of private financial investment into the world of environmental conservation and governance is the most direct means of conservation financialisation. Several tendencies are indicative of this movement. First, is a notable presence of new investment funds offering products and services linked with discourses and indices of environmental conservation and sustainability. The investment fund EKO Asset Management Partners, for example, is '... a specialized investment firm focused on discovering and monetizing unrealized or unrecognized environmental assets... in short, a "merchant bank" for the world of environmental markets'.⁸ EKO's investors hail from the world of *haute finance* and include James Wolfensohn, 9th president of the World Bank Group, as well as Lord Jacob Rothschild and Alexander and Ben Goldsmith of the Rothschild and Goldsmiths banking dynasties. Their approach is to 'stimulate the development of environmental markets' through aligning 'smart capital with people, projects, and companies that are poised to profit from emerging markets for ecosystem services, whether they be markets for carbon, for water quality, or

for biodiversity’.⁹ Investments are oriented towards: ‘land with undeveloped or unrecognized environmental assets with a view to developing these assets and profiting from their sale in emerging environmental markets’; ‘the development of credits destined for environmental markets derived from land-based assets’; and ‘companies... poised to profit from these emerging markets’.¹⁰

The investment fund ‘Inflection Point Capital Management’, has a slightly different focus but environmental sustainability is emphasised as key for investment choices. The fund’s website describes it as ‘the world’s first multi-strategy asset management boutique offering exclusively sustainability-enhanced investment products across a broad range of asset classes’.¹¹ The fund-managers identify ‘recent market meltdown as a multi-trillion dollar “advertorial” for sustainability-enhanced approaches’,¹² and aim to increase the ‘sustainability alpha premium’¹³ of company performance through incorporating proxy measures of ‘sustainability performance’ into investment practices. This latter investment fund is headed by Matthew Kiernan, acclaimed author of *Investing in a Sustainable World: Why Green is the New Colour of Money on Wall Street* (Kiernan 2009), former President of the World Business Council of Sustainable Development (WBCSD), and regular speaker at the annual Davos World Economic Forum. Kiernan (2009:xvii, xiv) suggests that we are entering a ‘sustainable investment revolution’, poised to re-engineer ‘the very “DNA” of the capital markets’. The cover of Kiernan’s book displays a blue-green earth, half of which is subsumed by gleaming American quarter-dollar coins; an image echoing painted representations of the globe used in the 1500s and 1600s to depict a growing global trade in commodities captured by an emerging European mercantile class.

The above illustrate private sector financing of entrepreneurial activity in the realm of new markets in environmental conservation, and attempts to enhance corporate indicators of environmental sustainability through private investment practices. Additional proposals illustrate possible mechanisms for institutional capture of state resources by finance (cf. Bellamy Foster and

McChesney 2009) in the arena of environmental governance. Amidst a ‘lush, new investing landscape’ (Smith nd) of ‘green bonds’, the creation of index-linked carbon bonds to be issued by governments, for example, is attracting interest by financiers.¹⁴ Modelled on the JENI Carbon Beta (JP Morgan’s Environmental Index-Carbon Beta) designed by Matthew Kiernan, the investment fund manager mentioned above, and as described by the London Accord business and investment network, ‘[a]n index-linked carbon bond is a government issued bond where... interest payments [from government to investors] are linked to the actual greenhouse gas emissions of the issuing country against published targets’ (London Accord 2009). This would mean that ‘[a]n investor in this bond receives an excess return if the issuing country’s emissions are above the government’s published target’ (London Accord 2009; also Onstwedder and Mainelli 2010). The rationale is that the issuing government then has an additional *incentive* to make sure national emissions targets are met, because this will enable them to pay lower interest rates to bonds issued to investors. Investors in turn would provide governments with cheaper debt *as long as* governments meet their emissions targets. The implication is that private sector ‘green investors’ will be *governing*, or at least *disciplining*, governments on their carbon/climate policies, via the incentives built into the bond structure. This structurally shifts the locus of responsibility for global environmental outcomes into the incentivising domain of investment finance. Further, with profit as the intrinsic logic underscoring investment, it seems naïve not to think that additional forces might conspire to keep country emissions levels high, thus perversely ensuring high flows of capital from governments to ‘green investors’ in the form of interest payments.

Conventional banks also are turning their investment practices towards substantially integrating environmental ‘assets’ into lending. The Forest Carbon Partnership Facility of the World Bank is supporting forest-rich countries of the global south to enter the global offsetting trade in carbon (Ranganathan, Irwin and Procopé Repinski 2009:5). The European Investment Bank is working with the University of Stirling’s Management School to ‘design markets for ecosystem service

delivery' (or 'eco-delivery' as they call it).¹⁵ Multilateral development banks, themselves increasingly making private sector investments that go towards financial intermediaries and private equity funds (Bretton Woods Project 2010), are being encouraged to 'partner countries to sustain their natural capital'. This is through integrating mapped and monetised 'ecosystem services' in all bank 'strategic direction-setting, investment, and advisory services' (Ranganathan, Irwin and Procopé Repinski 2009:5). An interpretation of these moves, consistent with the thesis that financialisation currently is driving accumulation, is that large bank lenders are financialising their own investment practices (through lending to private sector finance), at the same time as encouraging the increasing financialisation of environmental conservation.

Nature Work

A significant conceptual move enabling the financialisation of non-human nature, is the construction of nature as a 'service-provider'. Conservation biologists have been using the language of ecosystem services since the 1970s (e.g. Bohrmann 1976; Ehrlich 1982). The 2005 publication of the influential United Nations Millennium Ecosystem Assessment (MEA), which highlights human-generated change of the biosphere, overwhelmingly uses this language in speaking of the non-human world. It proposes that breaking nature down into its increasingly scarce services, quantifying their functionality (i.e. their work), and assigning prices to this, will assist conservation by transforming nature's activities from externalities to priced services, at the same time as fostering economic growth by creating new tradable assets (MEA 2005). More recently, the Deputy Head of the Species Programme of the IUCN has stated that '[i]t's time to recognize that nature is the largest company on Earth working for the benefit of 100 percent of humankind – and it's doing it for free' (in IUCN 2009). In combination, this language creates non-human nature as a company that needs to be acknowledged for the service work that it does. Of course, any ensuing payments do not actually go to nature, but to the people who are able to capture them. What becomes significant then are questions of what nature work is able to become billable, and of who, via

enforceable property rights signalling ownership, becomes able to capture the revenue arising from payments for this billable work.

The growing discourse on payments for ecosystem services (PES) both creates, and attempts to resolve, precisely these questions. The key idea here is that those wanting and/or requiring the 'service' of environmental health should pay those dwelling in the landscapes in which these 'services' are located. These flows and 'cascades' (Haines-Young and Potschin 2010) of services and payments can be seen most clearly in the case of downstream water users paying upstream users to maintain water flow and/or quality (Perrot-Maître 2006). Given both the location of valued ecosystems in the 'global south', accompanied by the need for their services in the industrialised 'global north', payments from north to south for service maintenance by the south for the north increasingly are being posited as a means of producing win-win sustainability (i.e. conservation and economic development) scenarios (UNEP/IUCN 2007). The result is an urgent requirement to measure, assess, standardise and disaggregate nature into new 'goods and service categories', combined with measures of their health and/or degradation and the assigning of monetary values to these measures (cf. Ruffo and Kareiva 2009).

This is being done via rapid ecological assessment and economic valuation techniques. The latter rely heavily on contingent valuation or estimates of 'willingness to pay', the validity of which has received intense criticism within economics (Spash 2008). Ecosystem service valuation projected from unit values (dollar estimates of economic value on a per-unit basis) derived from particular use and non-use values measured at specific sites, also is often arrived at via the practice of 'benefit transfer'. This parallels the conceptual convenience, as noted above, of the substitutability or *correspondence* between different locations, by permitting the transfer of 'economic value estimates from one location to a similar site in another location', an assumption and practice that again can produce a number of transfer errors (discussed in Plummer 2009). Through investment combined

with regulatory and legislative support, these valuation techniques are permitting the creation of an array of new markets in the environmental service products represented by the measurements they generate. They are ushering in an enormous systematic and competitive effort to measure, catalogue, *dissect* and ‘value’, i.e. monetise, nature’s ‘goods and services’, via an emerging ‘ecoinformatics’ that entrains mapping, measuring and monetisation techniques to produce combined ecosystems services catalogues, applicable from local to global scales (Table 1 lists four current and massive ecosystem services valuation initiatives).

All this effort constitutes a systematic ushering in of a new large-scale economic-environmental science so as to bring into focus a world of measured and ‘valued’ ecosystem services or ‘nature work’. The collaborative (and competitive) investment in complex ‘ecoinformatics’ approaches is connecting and entraining ecological and economics data so as to create ‘value’ at various ecosystems scales, and to produce what Igoe (in press) is terming ‘eco-[i.e. ecologically *and* economically] functional nature’. It parallels capital investment in bioinformatics at the scale of molecular biology (e.g. Prudham and McCarthy 2010). In combination these moves work to permit consolidation of claims to domains (and inventions) of life, and as such to ‘expand the scale and scope of capital accumulation via so-called “extra-economic” means’ (Prudham 2007:411). They constitute the creation of billable nature work.

They are also radically reframing inhabitants of service-producing landscapes as service-maintainers for consumers elsewhere in the global ledger of environmental services, at the same time as acting to capitalise landscapes such that they can be brought into global markets in various ways. The implications for those dwelling in landscapes newly priced for their ecosystem service functions are profound, as is indicated by proposals that local people might mortgage the environmental values newly associated with local landscapes so as to provide income for local development. The suggestion here is that communities in low income nations finance poverty

alleviation and economic development through offering newly monetised ‘environmental assets’ as collateral for ‘environmental mortgages’. These would be loans offered by international environmental investors that are linked to measures of the state of an ‘environmental asset’ (Donlan 2009). They would contribute ‘debt-based investment’, i.e. that ‘capitalizes environmental assets locally and makes that capital available to local communities through collateralized lending, microfinance approaches, and access to affordable financial services’, thereby ‘providing access to affordable financial services in exchange for environmental stewardship’ (Mandel, Donlan, Wilcox, Cudney-Bueno, Pascoe and Tulchin 2009). In these proposals, then, sustained ecosystem services as newly priced nature values are to be used as collateral for loans so that people of the ‘south’ – or the ‘fortune at the bottom of the pyramid’ as the business community likes to frame them (Pralahad and Hart 2002) – can be brought further into the global monetary economy. Complex questions arise of who then possesses or has governing powers over the collateral (particularly in the case of default), and of how the pricing of local ecologies intersects with other socially embedded culture:nature values.

Nature Banking

Alongside creation of nature as billable service-provider, is a conceptualisation of the health and degradation status of nature’s services as akin to a bank account of ‘natural capital’. In 1996 Maurice Strong, Secretary General at the 1972 UN Conference on the Human Environment in Stockholm and the 1992 Earth Summit in Rio, and first Executive Director of the UNEP, thus stated in a lecture to the Korea Institute for International Economic Policy, Seoul, that global environmental sustainability could only be achieved through ‘running “Earth Incorporated” with a depreciation, amortization and maintenance account’ (Strong 1996). This statement is quoted in full on the website to EKO Asset Management, the ‘merchant bank’ for environmental markets described above. An accompanying and increasingly popular conceptualisation of nature in terms of assets and natural capital completes the entraining of nature concepts with those associated with

banking, permitting the further treatment of ‘nature’s benefits as wealth-creating assets’ (Ranganathan, Irwin and Procopé Repinski 2009:5).

Unsurprisingly then, ‘nature banks’, managed by nature bankers, are emerging as key management structures in environmental governance for conservation. By creating the nature that capital can see (Robertson 2006), in part through capitalising the service work that it is deemed to do, and in tandem with formalised property rights, landowners (private or collective) can become nature entrepreneurs: they can capitalise on the new nature prices accruing to the ‘nature assets’ associated with the monetised and thus billable service work accruing to defined land areas. Forms of ‘nature banking’ now are prominent in the US and Australia, and this approach is gaining traction elsewhere. An array of ‘wetland mitigation banks’, for example, exists in the US. These enable landowners to realise ‘value’ through maintaining wetland ecosystems by entering into financial exchanges with developers intending to degrade wetlands elsewhere, and accompanied by permitting and regulating legislation (Robertson 2004). Species banking has proliferated in recent years, particularly in the US (e.g. see www.speciesbanking.com; also analysis in Pawliczek and Sullivan forthcoming), and biodiversity banking (or ‘biobanking’) now is advocated such that ‘[a]ccrued investment [by landowners in biodiversity] could be sold to a party wishing to liquidate an equivalent amount and quality of vegetation elsewhere in the landscape’ (Bekessy and Wintle 2009:211; also Bayon and Jenkins 2010). The UK is now entering the environmental mitigation banking arena, with recent announcement of its first conservation credit scheme to be facilitated by The Environment Bank Ltd.,¹⁶ within a conservative policy discourse that considers a future biobanking *industry* to be worth billions (Conservatives 2010). The nature banking and offset market approach has been advocated particularly strongly by the Katoomba Group, ‘an international network of individuals working to promote, and improve capacity related to, markets and payments for ecosystem services (PES),¹⁷ and whose online ‘Ecosystem Marketplace’ (www.ecosystemmarketplace.com) provides market information to facilitate transactions.

Private investment is promoted as the source of funds to facilitate the creation and structuring of nature banks and the ensuing mitigation banking market. The Ecosystem Marketplace's former Director and co-founder in fact is now a partner and co-founder of EKO Asset Management Partners, the merchant bank mentioned above established precisely to invest in – i.e. to capitalise – these new markets in new environmental products (Bayon 2008b). The consequent attaching of prices to nature's 'services' permits the banking of these new nature values by those who own land and whose ownership is protected by property law. The mission of the US Office of Ecosystem Services and Markets thus is to 'focus on scientifically rigorous and economically sound methods for quantifying carbon, air and water quality, wetlands, and endangered species benefits in an effort to facilitate the participation of farmers, ranchers, and forest *landowners* in emerging ecosystem markets' (quoted in Fox 2009:208-209, emphasis added). In combination, then, the process serves to add and bank more monetary value to that which is already able to enter a market exchange; i.e. to that which already is formally owned (discussed further below).

Nature Derivatives

I have noted above the proliferation of increasingly derived carbon products as a constitutive aspect of the expanding frontier of conservation commodity markets. The creation of increasingly derived environmental-financial products, or 'nature derivatives', in additional environmental domains is a burgeoning feature of the alliance of finance with the creation of new markets in environmental conservation commodities for the lucrative management of environmental risk.

A recent paper in *Frontiers in Ecology and the Environment*, for example, proposes the creation of 'biodiversity derivatives' (Mandel, Donlan and Armstrong 2010). A derivative contract 'is a bet as to whether the value of the underlying security, which might be a stock, bond, or financial index, will increase or decrease by a specified date' (e.g. Adams 2010), permitting businesses to 'hedge

against the occurrence of unpredictable adverse events' (Cooper 2010:177). As such, they are associated with the appropriation of risk as a tradable commodity (Gudeman 2010:7), at the same time as also permitting speculative returns based on the chances of the derivatives contract itself (Cooper 2010:177). In recent years, derivative creation has extended into the turbulent realms associated with unpredictable atmospheric, oceanic and biospheric dynamics, permitting the direct hedging and trading of environmental contingencies in capital markets (as superbly described and theorised by Melinda Cooper 2010). For biodiversity derivatives, Mandel, Donlan and Armstrong (2010) suggest that the market should be used to reduce the costs of conservation, by applying derivatives to the risk of species extinction. Their proposal is that 'governments issue modified derivatives contracts to sell species' extinction risk to market investors and stakeholders', as a means of providing *incentive structures* that take 'full advantage of the market to reduce costs in conservation' (Mandel, Donlan and Armstrong 2010:44). This, it is argued, will *align* the interests of conservationists, governments and landowners, by making species presence more valuable to landowners than modifying habitat through development. Biodiversity derivatives based on risk of species extinction would be akin to insurance derivatives, 'issued with modifications to allow responsible action to decrease the likelihood of the insured event' (i.e. extinction of a species) so as to encourage 'social change that is incentivized through market forces' (Mandel, Donlan and Armstrong 2010:45-46).

The transferring of derivatives logic to the domain of species survival seems strange. Futures exchanges might help stabilise prices for storable commodities by balancing sellers' hopes for rising prices with buyers' desire for the opposite. But it seems perverse to transform the value of species survival into prices whose rise or fall is entangled with bets on the likelihood of their being susceptible to their irreversible loss, underscored by a situation whereby species value rises with rarity, i.e. with greater risk of extinction. Strange (1998:17) notes that gambling on prices creates 'heightened volatility': is this what is wanted for species presence? Mandel, Donlan and Armstrong

(2010:45-46) argue, however, that through issuing a derivative whose value is based on *species decline*, and '[i]f the trading of species derivatives were responsibly permitted', then 'those who do not currently incorporate a conservation ethic into their economic decisions would stand to profit from a change in behaviour towards environmental stewardship'. This, of course, is a classic neoliberal suggestion to design, invest in, and legislate for market-based incentives to manipulate behaviours through appealing to the economic self-interest of those with protected access to land under formal property arrangements.

Proposals such as this act to enhance the ways in which environmental change, itself indelibly and inequitably entwined with human activity, can become 'a speculative opportunity like any other in a market hungry for critical events' (Cooper 2010:175). They are rationalising nature dynamics to fit the dynamics of human constructed financial markets, permitting the assigning of tradable prices to the unstorable commodities of essentially unknowable futures (Cooper 2010:176, after Mandelbrot 2004). So whilst the production of nature work and nature banking, as described above, is rendering nature into new 'mass of standardized, qualitatively indifferent exchange values' (Cooper 2010: 180), financialisation here is extending possibilities for nature's speculative release into the realm of circulating money in its new universal form of derivatives. This derivative realm 'challenge[s] the idea that the circulation of money must be anchored in some fundamental, underlying value' (Cooper 2010:178), whilst at the same time binding nature's dynamics, and associated wealth-making possibilities, to the influence of financial investment in other commodities. The innovative conceptual alignment of nature change with derivative finance products acts to materially enhance the fortunes of investors and their associated impacts, whilst shifting the locus of decision-making power regarding environmental governance to the realm of finance and the speculative expectations governing futures markets. It is capturing a nature of unpredictable flows and dynamism such that these are able to circulate as money – as a nature 'on the move' as Büscher (forthcoming) describes (also see Igoe forthcoming) – the power and material effects of which are concealed through the

abstract and seemingly virtual *milieu* of its movement.

THEORISING THE EMERGENT ENVIRONMENTALITY OF 'EARTH INCORPORATED'

The above documents the transformation of conserved nature into discrete 'billable hours' and bankable assets, whose release onto commodity markets in varied forms and at different scales is constituting an expanding investment frontier. The new and frequently opaque ecology of associated and intersecting terms and concepts on which this frontier feeds, constitute an emergent and systemic wave of semiotic (O'Connor 1994) and material enclosure of 'the global environment' into a range of commodity forms. This is producing an increasingly 'derivative nature' (Büscher 2010b) of complex, virtual and mobile nature products, made possible by empowered innovations in conceptualisations of the non-human world. These in turn have powerful material and immaterial effects on human nature, non-human natures and relationships connecting these domains. They are generating 'capital's new natures': an ecology of novel 'fictitious commodities' (Polanyi 2001(1944)) created by the new *prices* attributed to nature, which themselves are generated through application of a globalising finance-based hegemonic system that is homogenising (and hoovering up) all possible nature values. In what remains I theorise these phenomena through two key and complementary theoretical lenses: that of Marxian primitive accumulation, and of the consolidation of Foucaultian bio-political governmentality in the realm of socio-environment relations.

On Contemporary Primitive Accumulation

Primitive accumulation is the drive of capital and of its protagonists to both *create* and capture the forms of capitalist value that underscore all subsequent relations of production and exchange. For Marx, the two critical enclosures are of land as property, and human activity as labour, the creation of which required the historical separation of each from the other, or the *disembedding* of people from land-entwined social relations, as Polanyi puts it (2001 (1944)). Other scholars have

highlighted additional historical primitive accumulations as integral to capitalist strategy, together with the ideational changes that are required and effected in bending nature *in situ*, as well as human life and bodies, into the commodity form (e.g. Federici 2004, also highlighted in Roberts 2008; Perelman 2001).

The accumulations of productive forces that are not *a priori* manufactured for sale, all require, and are mirrored by, significant and frequently radical, i.e. onto-epistemologically unintuitive, conceptual transformations. New commodity fictions need to be imagined for them to manifest; and the commodity fantasies that become discursively and materially prominent are those privileged by empowered socio-political structures, which in modernity are associated with imperial and patriarchal adventure. In relation to the non-human world, the radical application of a notion of absolute private property to land areas, and a rejection of prior values, access or use rights by those dwelling there, underscores all subsequent commodity creation. Land itself becomes capital that can be owned absolutely: the monetary value of which can rise and fall in relation to other monetised commodities, and the exchange of which can occur at a distance with money as symbolic medium and measure of value. In combination, land and human activity are transformed from subject to object, thereby permitting their reification as tradable commodities (cf. De Angelis 2001:7). Viewed through the onto-epistemological lens of non-capitalist cultures, whether historic or contemporary, such conceptualisations can be a nonsense. Instead it might make more common sense to think that land ‘owns’ people (e.g. Basso 1983), or at least is animated by myriad other sources of relationship, value and ethical requirements (cf. Ingold 2000; Viveiros de Castro 2004; Sullivan 2010).

Marx states additionally that ‘[a]s soon as capitalist production is on its own legs, it not only maintains this separation [of labour from the means of capitalist production], *but reproduces it on a continually extending scale*’ (Marx 1974 (1887)). Massimo de Angelis (2001) refers to this as the

ontological, as opposed to historical, condition of capitalist production, to describe the continuous creation, capture and enforced possession of new commodities that permit capital's recursive accumulation. Many other authors have stressed this *continuous* nature of so-called 'primitive accumulation', from Rosa Luxemburg writing in 1913, to David Harvey writing in 2010. Recent analyses of primitive accumulation that see its historical shape as present in contemporary circumstances globally, thus frame the process as 'continuous' (De Angelis 2001), 'permanent' (Harvey 1975; Bonefeld 2001), and 'contemporary' (Glassman 2006). As Silvia Federici, maintains, 'primitive accumulation has been a universal process in every phase of capitalist development', re-launching 'similar strategies in the face of every major capitalist crisis' (Federici 2004:16-17, 104).

Historically and today, rises in capital 'values' for land increase the possibility for enhanced money rents, and strengthen desires by land-owners to expropriate land-dwellers, thus 'releasing' their availability as labour (Marx 1974 (1987):673, 686-8; Gordon and Sholto Douglas 2000). The current proliferation of new nature values and tradable commodities for environmental conservation, as outlined above, can be understood as a similar and significant wave of primitive accumulation in these terms. They are structuring nature into the reified and exchangeable commodity form in previously unthought ways (Kosoy and Corbera 2010), at the same time as creating additional ways of bringing diverse peoples into the global market in service to these new commodity forms. As such, they are consistent with maintaining a political economic (and cultural) system in which 'only production-for-market... [is] defined as a value-creating activity' (Federici 2004: 75).

Implicit in the creation of new conservation commodity markets, for example, is a configuration of nature and nature protection for gain by capital. This is because such markets are based on enclosures associated with particular formalised property rights, in that commodities can only be legally traded if they are formally owned. In nature banking, for example, income accruing from

exchange goes to landowners (whether private or collective) and those able to enter into formal agreements regarding any additional ecosystem service value gained from investing in initiatives that add such 'value' to land. In industrialised economies, land already is so concentrated in the hands of large landowners that further inequalities in landholdings may not ensue, but further accumulations of wealth amongst propertied 'nature entrepreneurs' of course are what is being promoted (the conservation argument being that this will prevent the conversion of these lands into uses that might be environmentally degrading). In market conservation terms such initiatives are logical because they putatively make the possibility of benign relationships with the nature on private land more likely, but only to the extent that markets in new environmental products on this land remain buoyant. Such initiatives do not engage seriously with any of the equity or environmental justice issues arising from the unequal distribution in land and wealth that such proposals build on.

In so-called emerging or survival economies (Hart 1997), significant displacement effects can arise from such environmental 'value-adding' initiatives (for detailed examples in Mexico and Uganda, see Corbera, Brown and Adger 2007, and Checker 2009). In these situations, people can find it difficult to demonstrate formal tenure over land, even if they have dwelled there for generations. Moreover, given the private property fetish of capitalist market relations, it remains difficult, if not impossible, for the distributive and other complexities of communitarian relationships based on sharing and on diverse nature-knowledges to enter into the market environmentalism discourse. In such circumstances accumulation by capital often involves the contemporary breaking and dismantling of peoples' land-entwined socio-economic worlds and practices through eviction and displacement (Brockington and Igoe 2006), accompanied by privatizations of land tenure (cf. Federici 2001). These processes tend to accumulate land and resources in the hands of élites (Thompson and Homewood 2002).

The aligning of speculative investment practices with environmental governance for conservation also seems problematic. Speculators gain spectacular returns by creating commodity bubbles and then withdrawing their finance before these pop. As Paul Volcker, Former Federal Reserve Chairman wrote of probably the most famous financial speculator George Soros, he ‘has made his mark as an enormously successful speculator, wise enough to largely withdraw when still way ahead of the game’ (in Soros 2003:vii).¹⁹ In the financialisation of environmental conservation and the accompanying new frontier of conservation investment, it is unclear how speculative behaviours are to be regulated so as not to create conservation commodity bubbles that pop, such that investment is withdrawn and directed elsewhere. At the same time, it is precisely this possibility of capturing capital through investment in environmental governance for conservation that is attracting investment finance in this frontier. Finally, the indebting of people through lending practices based on financialised local ecologies (as with environmental mortgages), may reduce local sovereignty over natural resources and bind people into financial debts that can act to constrain self-reliance by necessitating production for cash rather than direct sustenance.

As such, the current new environmental infrastructure that is being designed by *haute finance*, corporations, mega-ENGOS and university research teams extends a process of contemporary primitive accumulation in service to the reinvention and expansion of capital(ism). Arguably then, it is enhancing three things: 1. a continuing dismantling of human land-entwined livelihoods and lifeworlds to release both new discrete nature products and human labour for global markets; 2. an increasing concentration of capital in the hands of fewer individuals, organisations and elite networks; and 3. an instituting of new dependencies on the global market economy, accompanied by systemic exclusions and expulsions (cf. Sassen 2010). Notwithstanding a rhetoric of assisting with the improvement of incomes for ‘service-providers’ in the global south, or intense research and development effort to create enabling policy contexts for this to occur, it is difficult not to arrive at a conclusion that the financialisation of environmental conservation is suggestive of phenomena that

will enhance the structural inequities associated with capital accumulation. When set in the context of rapidly growing land speculation and land grabs in countries currently valued for their ecosystem service provision (von Braun and Meinzen-Dick 2009), as well as growing wealth differentials globally (Branko 2005), these tendencies seem set to align with what Saskia Sassen (2010) is describing as the ‘savage sorting of winners and losers’ effected globally by contemporary primitive accumulation.

The Environmentality of ‘Earth Incorporated’

My second theoretical frame inserts this logic and practice of contemporary primitive accumulation as a necessary aspect of creating ‘Earth Incorporated’ as the dominant ‘environmentality’ shaping environmental governance today, and draws on Michel Foucault’s work in various ways. Foucault emphasised that new regimes of governance are structured and bolstered by new social sciences, which iteratively also enable new techniques of management and administration that concord with the *episteme* of modernity. At the time of the rise of the bourgeois class and the Age of Reason in Europe, for example, he makes much of the accompanying presence of a novel bourgeois spirit that partitions, makes distinctions, classifies, codifies and calculates (Foucault 2001 (1975):137-8; also Federici 2004:chapter 4). He is talking here about the body; and about the new social sciences that helped to construct, subject, manage and *accumulate* the body as a utility-maximising ‘body-machine’, as well as to rationalise and administrate bodies as *populations*. In the contemporary arena of primitive accumulation in association with global environmental governance, we are bearing witness to intense extension of these tendencies into socio-ecological domains. This is through creation of the socio-environmental science of ‘ecosystems services’ and service-maintainers, which is acting making nature’s ‘operations intelligible and controllable’, and, importantly, ‘void of any intrinsic teleology’ (Federici 2004:139) or agency (Plumwood 2006).

Through ecosystem service science, nature, like the body, is being made conceptually docile. It is

becoming 'caught in a [new] system of subjection', whereby its behaviour is 'calculated, organized, technically thought' and 'invested with power relations' (Foucault 2001(1975): 24-26). As with the new sciences of demography, nutrition etc. that make possible the administrations of the modern era and which involved the *application of accounting to social relations*, currently we are witnessing the similar *application of accounting to socio-environmental relations*. This is through the seemingly neutral and thoroughly depoliticised new sciences of carbon accounting and ecosystem services. Like the human body, and the body-politic of populations, nature as service-provider is 'entering a machinery of power that explores it, breaks it down and rearranges it', thus bending and releasing its immanent forces towards economic utility (Foucault 2001(1975):170). The body 'as a receptacle of magical powers', together with an 'animistic conception of nature that did not admit to any separation between matter and spirit', are broken down (Federici 2004:140-142) to be reconstituted into alienating new natures that circulate as both labour and finance capital. In transforming and accumulating the body's and 'Nature's' exceeding immanence into 'work powers', the animated, embodied and sentient world experienced by non-capitalist rationalities is of necessity erased. Alvehus and Spicer (forthcoming) note that the increasing experience of work as financialised 'billable hours' is a classic strategy of workplace control. Similarly, the 'micro-physics of power' operating in the multiplicitous moments and institutional apparatuses of ecosystem service science is strategically *training* socio-environment relations into those of Earth Incorporated (Foucault 2001(1975):26, 170), in the process creating nature as both usefully productive and utterly subdued. Although seeming to pull in a different direction, derivative products associated with unpredictable environmental risk are similarly flattening nature's life and dynamism, through structuring and disaggregating these constituents of turbulence into financial products designed precisely to transform and release these qualities into the circulating and monetised derivative commodity form (Cooper 2010).

Following Prudham's analysis of the invention and sanction of commodities in the molecular realm,

the above constitute the 'discursive and institutional work necessary to render the messy materiality of life legible as discrete entities, individuated and abstracted from complex social and ecological integuments' (2007:414). This creates, or more accurately sanctions, the 'theft' of new, and variously privatised, properties from the work of 'complex social and biophysical contributions' (Prudham 2007:414). As Prudham (2007:425) notes further, in the ensuing discursive and institutional production of new nature 'things', these are severed 'from contending use rights' (local food production for example), so that they are able to circulate as exchange values from which additional market 'value' can accrue. The process in its entirety is supported by capital's accomplices: universities, E(NGOs) and other civil society organisations, the legal system and property rights supporting and enforcing enclosure (Prudham 2007:423).

Foucault's more recently published work, particularly his lectures of 1978-79 on biopolitics, published in English in 2008, is critically illuminating in this respect (Foucault 2008(1979)). Prescient as ever, he draws to the fore the socio-political fact of the 'truth regime' of the market under liberalism; and the corresponding necessity of working to create the governing incentivising and regulatory structures that allow for the 'free market's' need for 'frugal government'. As Martin O'Connor (1994:141) has also noted, '[t]he logic of the marketplace states plainly that all capitals will realize their "full value" only by insertion within the sphere of exchange value. Under the doctrine of utility maximisation, their best use will be signaled by price: they should always go to the highest bidder'. Muradian, Corbera, Pascual, Kosoy and May (2010) describe how this naturalisation of capitalist 'free markets' also is rationalised by a Coasean institutional economics that assumes the emergence of social and environmental optima through the incentivised bargaining of those with private property allocations. These market workings require the so-called 'rolling back of the state', combined with the bolstering of the private sector's capture of public resources (including 'nature'), both of which are hallmarks of neoliberal capitalism.

In combination, these constitute a 'governmentality' that ironically requires intense government and public engagement to facilitate the construction and regulation of the incentive structures that discipline individual and corporate behaviour, such that this conforms with the logic of the 'free market'. This, as Noel Castree (2008a:144) notes, is 'the paradoxical need for "free" markets to be managed'. Robert Fletcher, in a soon to be published article in *Conservation and Society*, extends this notion of governmentality to highlight the governing incentive structures associated with *environmental* governance for environmental conservation under neoliberal logics, as well as the different *environmentalities* associated with other governing logics. Through continuous processes of primitive accumulation to ensure release of new commodities in service to the drive for production of surplus capital (profit), and under the governing value-frame of environmentalism, i.e. which necessitates the participating of all environmental concerns in the logic of the market, all environmental phenomena become framed, traded, banked and circulated as capital. Given the truth regime of the market, then, the art of government in relation to 'environmental conservation' of necessity will be the environmentalism of 'Earth Incorporated'.

CONCLUSION: THE NATURE OF THE BEAST?

Current rationalisations and monetisations of nature in terms of the disaggregated, commodified and banked services that 'it' provides, constitute a new mechanisation of nature management to satisfy discourses of efficiency in the realm of environmental conservation (Federici 2004:70), whilst maintaining accumulation as 'the engine which powers growth under the capitalist [conservationist] mode of production' (Harvey 1975:9). The enhanced separation of human from non-human worlds that this permits makes possible further transformations of nature from subject into object, constituting a significant new layer in the reification of nature as an object consisting of many objects. Nature's agency is foundationally discounted (cf. Plumwood 1996), and human:non-human relationships become further disciplined into master-slave or doctor-patient configurations (Sullivan

2009). Nature is reconstituted as ‘service-provider’ for humanity, and people dwelling in landscapes now valued for their ecosystem services are transformed into the labour needed to maintain these services (or are displaced). To paraphrase Sassen (2010:30), vast regions of the world are being repositioned and territorialised as sites for capitalised global ecosystem services conservation and supply.

All these market-based innovations are being effected to accord with the desirable objective of promoting nature’s conservation. But there is an intrinsic fallacy at the heart of these conceptual and technical strategies to incentivise environmentally ethical behaviour via the design of commodity markets and associated trading activity. This is that ‘the market’ does not in and of itself embody or produce virtuous behaviour. The market does not care. And given a political economic system based on the ‘permanently revolutionary force’ of capital accumulation (Harvey 1975:9), it seems to be problematic to assume that it is only the correct design of markets, e.g. through pricing mechanisms, that will prevent the manifestation of nature losses through trading and speculative practices. What is being promoted here is a valuing of nature *as money*, not of nature’s immanence or sentience, or as a communicative community of which we as humans are one of many companions. And since the ‘free-market’ is an emergent property of the competitive dance of multiple commodity prices, exchanges and other asymmetries and influencing factors, there is nothing intrinsic to this system to uphold the prices of environmental health relative to unpredictably shifting prices of other commodities.

It seems pertinent to remember Polanyi’s (1944:187) description of the transformation of land into the commodity form as ‘perhaps the wierdest of all the undertakings of our ancestors’. Currently we are in the midst of an equivalently revolutionary shift in empowered ideas regarding a global geography of non-human natures. While these build on extant understandings of land as commodity and of private property, they extend these in radical ways to release new nature ‘values’ that can be

traded, invested in and speculated on via conversion into the commodity form. To paraphrase Marx (1974 (1987):698), once again, a 'new social soul' is popping into the body of nature; as the non-human world becomes enclosed, conceptually, economically and legally, into new nature products, and as human:nature becomes reoriented around the emerging environmentality of Earth Incorporated. The inducing of humane, healthy and equitable socio-ecological relationships instead requires moving in an entirely different direction: towards conceptualising and embodying socio-environmental realities that connect human and non-human ecologies without the always mediating and structuring sign of money.

ENDNOTES

1. By 'neoliberal' (and 'neoliberalism') I refer in particular to the coalescence of globalising political and economic policies consolidated by the Washington Consensus drawn up in 1989 by economic advisers to the major international financial institutions (primarily the World Bank and the International Monetary Fund). This global(ising) policy framework is complex in structure and 'polyvalent' in effects (cf. Ferguson 2009), but includes: deregulation of international finance flows; protection of business interests in part via the establishment of so-called 'free trade' regions; and structural adjustment programmes which 'developing' countries are expected to agree and adhere to so as to access donor funds for development purposes. These introduce a range of conditionalities, frequently oriented towards the opening up of 'southern' markets and utilities to international business, and the 'rolling back of the state' to permit further trade, private investment and donor permeability in such contexts. Major International Non-Government Organisations (INGOs) and Environmental NGOs have mushroomed in this context to fill the facilitating and implementation vacuum left in circumstances of weakened states and public sectors (e.g. Brockington and Scholfield 2010). The varied ways in which the combination of such structuring processes have vested sovereignty, i.e. decision-making powers, in locations beyond the nation state has famously become termed *Empire* by Michael Hardt and Antonio Negri (2000). For more detail on the neoliberalisation of both nature and of nature's conservation see McCarthy and Prudham (2004), Sullivan (2006), Igoe and Brockington (2007), Castree (2008a, 2008b), Büscher (2010a) and Büscher B, Brockington D, Igoe J, Neves K and Sullivan S (forthcoming).
2. http://www.advancedconservation.org/blog/?page_id=58 (accessed 7 December 2009).
3. <http://www.unep.org/greeneconomy/> (accessed 23 April 2010). Thanks to Bram Büscher for drawing my attention to this image.
4. Other key films include *An Inconvenient Truth* (2006) and *The Day After Tomorrow* (2004), both of which spectacularly emphasise pending environmental crisis and the critical need for intervention.

5. Available for viewing at <http://www.youtube.com/watch?v=KY08NIXvrxc> (accessed 23 February 2009).
6. <http://www.conservation.org/discover/team/bod/pages/default.aspx> (accessed 23 September 2010).
7. <http://www.conservation.org/discover/partnership/corporate/Pages/default.aspx> (accessed 23 September 2010).
8. <http://ekoamp.com/who/> (accessed 23 April 2010).
9. <http://ekoamp.com/approach/> (accessed 23 September 2010).
10. <http://ekoamp.com/approach/> (accessed 23 September 2010).
11. <http://www.inflectionpointcm.com/> (accessed 26 April 2010).
12. <http://www.inflectionpointcm.com/timing.html> (accessed 17 March 2010).
13. <http://www.inflectionpointcm.com/investhesis.html> (accessed 23 September 2010).
14. I am grateful here to my colleague Martin Frost for talking me through the history and workings of government issued bonds, to Leland Lehrman for including me in a recent email discussion regarding green-indexing and to Geoff Cheshire for subsequent discussion.
15. <http://www.eco-delivery.stir.ac.uk/> (accessed 30 May 2010).
16. <http://www.environmentbank.com> (accessed 23 June 2010).
17. <http://www.katoombagroup.org> (accessed 23 April 2010).
18. I am grateful to Jim Igoe for drawing my attention to this quote, and for clarifying the role of speculation in creating bubbles of value.

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Table 1 Details of four current major global ‘eco-informatics’ initiatives to map and price of ecosystem services.

Initiative title	Organisations	Details	Sources
Natural Capital Project	The Nature Conservancy (TNC), The World Wide Fund for Nature (WWF), Stanford University	10-year project to develop tools for the modelling and mapping of the economic value of ecosystem services and to construct a global ‘natural capital database’	http://www.naturalcapitalproject.org/home04.html (accessed 16 December 2009)
ARIES: Artificial Intelligence for Ecosystem Services	Conservation International (CI) and partners	Project launched in 2009 to create ‘a web-based technology... offered to users worldwide to assist rapid ecosystem service assessment and valuation at multiple scales, from regional to global’. The output of ‘an ARIES user session’ is ‘an <i>environmental asset portfolio</i> that describes in depth the spatial distribution of ecosystems and ecosystem services in the area, their potential and realized economic values’.	Conservation International (2009:6) ARIES Consortium (2009:1) Villa, Ceroni, Bagstad, Johnson and Krivov (2009)
ESPA: Ecosystems Services for Poverty Alleviation	UK’s Department for International Development (DfID), Economic and Social Research Council (ESRC) and Natural Environment Research Council (NERC)	£40.5 million funding for interdisciplinary research on delivering Ecosystems Services for Poverty Alleviation. The call for applications describes the need to ‘generate the evidence on ecosystem services [and] their full value’, and the normative framework is the intent to foster sustainable economic growth as ‘green growth’.	NERC (2009:4) DfID/ESRC/NERC (2010:7)
TEEB: The Economics of Ecosystems and Biodiversity	European Union (EU) and United Nations Environment Programme (UNEP)	Massive research programme identifying ‘lack of market prices for ecosystem services and biodiversity’ as the key driver for both biodiversity loss and negative impacts on human well-being; and the assigning of market prices to nature will enhance both ecological and social health.	ten Brink, Berghöfer, Schröter-Schlaack, Sukhdev, Vakrou, White and Wittmer (2009:2)