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Cultural ecology: the problematic human and the terms of engagement

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I Hasn't the IPCC read Latour?

It has been a lively week for anyone who works under the broad umbrella of approaches sheltered by the term cultural ecology. Our second year biogeography class went down to the salt marsh to learn about transects and ecotones and was turned back by a hastily erected sign delivering a tsunami warning. The impact of the Solomon Islands tsunami in our area was subsequently measured at only 10–15 cm above normal tide levels. The students discussed risk, vulnerability, how to predict tsunamis and whether they still had to hand in their pracs. According to this morning's headlines, the UN's Intergovernmental Panel on Climate Change has declared the 'planet in peril' and 'the window closing' on its chances. Biodiversity in Australia's World Heritage sites, many of which are on the coast, is declared particularly vulnerable.

Just like any other week really, since relations between human and non-human worlds are at the heart of things. But, in Australia at least, the planetary alignment of a long drought, Al Gore, Nicholas Stern and a contest for the Federal Environment portfolio between a merchant banker and a rock star cum environmental activist (each of them also an articulate lawyer) has cracked open the public conversation in a way not seen for more than a decade.

But it is not a simple conversation to participate in. Now that the natural and physical sciences are finally convincing politicians that half a century of research really does show that human activity is the dominant influence on earth surface processes, the human sciences have entered their post-humanist moment and want to talk about the agency of trees and wolves. Many ecologists are recognizing that science is not enough and that we need a culture change in the way we use and manage resources,[1] just after culture has been declared dead (Castree, 2004). Doesn't the IPCC know that it should be talking about hybrids and networks rather than the dualisms of 'natural and human environments' (IPCC, 2007: 2)? Don't they realize the profound contradiction of the term 'human impact'; that it positions humans as outside the system under analysis, as outside nature, even as their evidence shows how deeply entangled humans are in the fabric of the earth and its processes? Are the science

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and humanities conversations about culture and ecology again passing like ships in the night? Hasn't the IPCC read Latour?

On the face of things, then, the public debate is irretrievably framed in the enlightenment dualisms we have spent several decades dismantling. And we haven't yet found a public vocabulary for imbroglios and acts of translation. Or have we? The empirical material in recent cultural ecological contributions to the 'environmental borderlands' (Zimmerer, 2007) is demonstrably rich and vibrant. It offers fresh and diverse challenges to any stale simple binary, even the apparently compromised one of 'cultural ecology' itself.

In this part of the world, the term cultural ecology is rarely used as an identifier of subdisciplines or people, but the perspectives and subject matter – human/environment relations across many scales, cultural dimensions of ecological change, nature/cultures – are a well-developed part of the geographic enterprise. This is in no small measure due to the politically contested and intellectually fertile collision of a unique continental ecology, longstanding indigenous traditions of environmental engagement, and the diverse influences of later settler cultures (Trigger and Griffiths, 2003; Anderson, 2006). In this report I consider aspects of the current 'terms of engagement' between the cultural and the ecological. Some of these conversations illustrate ships passing in the night; others show where enough traction is being gained for debate to occur. To the extent that they cohere it is around the problematic of the human – what they are, what they do.

II From impacts to agency

Our increased understanding of 'Man's role in changing the face of the Earth' (Thomas, 1956) is one of the key scientific achievements of the second half of the twentieth century. Geographers working within the cultural ecological tradition have made no small contribution to this achievement. Human activities now appropriate more than one-third of the Earth's terrestrial ecosystem production, and between a third and a half of the land surface of the planet has been transformed by human development (Vitousek *et al.*, 1997). Humans are inextricably embedded in all earth surface processes, and often dominate them. Two key concepts in cultural ecological approaches to long-term human/environment relations have been 'human impacts' and 'cultural landscapes'. Each of these demands critical reappraisal in light of recent posthumanist perspectives, which refuse the ontological separations of culture and nature, humanity and animality (Anderson, 2005; 2006; Franklin, 2006).

With the development of a battery of scientific techniques for reconstructing past environments, particularly radiometric dating techniques, historic and prehistoric cultural ecologies are now to be found much more in physical geography and archaeology than in human geography. It is here that reflexive approaches to the culture/nature dualism have scarcely been felt, or noticed. For example, titles of relevant prehistory articles (Table 1) illustrate a comparative method in which the conceptualization of nature and culture, or natural and human processes, as distinct and separate entities is entrenched. Approaches influenced by actor-network theory are only just beginning to appear.

It is precisely because of the pervasiveness of human activity, and the fact that it has been around for many thousands of years, that we need to critically re-examine the work that the metaphor of human impacts is doing. Human impacts is a hard-won concept that has made a crucial contribution to our understanding of the long-term human role in earth processes. It is central to many of the courses we teach and in the dominant and extremely valuable textbooks (Goudie, 2006). Yet the metaphor is doing different work now than it did during the middle decades of the twentieth century as an important counter to environmental determinism. It paradoxically reinforces the view of humans as external to the natural system, and encourages explanatory focus on simple correlations in time and/or space

Table 1 Examples of typical titles in articles which focus on human/environment relations

From nature-dominated to human-dominated environmental changes
Late-Holocene environmental history of A: natural dynamics versus human impacts
High-resolution fluvial record of B: climatic or human impact?
Environmental changes during the Holocene climatic optimum in C – human impact and natural causes
Human and natural impacts on forests along the D River: implications towards conservation and management
Declining stocks of Lake E's endemic F species: natural variation or human impact?
Natural environmental changes and human impact reflected in sediments of a high alpine lake in G

Source: five high-ranking prehistory and Quaternary journals (*Quaternary Science Reviews, The Holocene, Antiquity, American Antiquity, Current Anthropology*), 1995–2006.

rather than on mechanisms of connection. It is neither conceptually nor empirically strong enough for the complex networks of humans and non-humans now evident, in prehistoric as well as contemporary timeframes.

In a similar vein, the cultural landscape concept has played an important role in 'putting people in' to landscapes where their influence or presence was elided in different ways. In Australia, where the notion of landscape has historically not included the human element, the strongest use of the cultural landscape concept in the last few decades has been in ways that recognize indigenous presence in and connections to land. Indigenous connections to land in Australia's Uluṟu-Kata Tjuṯa and New Zealand's Tongariro National Parks both influenced and utilized the development of the World Heritage category of Associative Cultural Landscapes.

Plumwood (2006) argues that cultural landscape's work of putting humans in has gone too far, and merely inverted the arrows of connection and causation found in nature-reductionist science. It:

> is an example of a concept that invites us to downplay or hide nonhuman agency and to present humans as having a monopoly of creativity and agency in the generation of what are called 'landscapes' … The concept of a cultural landscape has become a key part of an agenda in the humanities of human-centred and eurocentred reductions to culture that is the equal and opposite to the natural sciences reduction of explanation to nature. (Plumwood, 2006: 119–20)

The type of cultural landscape to which Plumwood (2006) directs her critique is explicitly the Sauerian one (p. 121) and the landscape concept that she focuses on is a passive one, framed visually (p. 123). To that extent she is critiquing a cultural landscape concept that would now be considered quite outdated in geography. Plumwood wants to recognize multiple and mixed agencies in ways that have been articulated in the social sciences under the umbrella of actor-network theory. 'This means that the outcome of any given landscape is at a minimum biocultural, a collaborative product that its multiple species and creative elements must be credited for' (p. 125).

Her approach thus has much in common with attempts in cultural geography and elsewhere to recognize the agency of plants, animals and other parts of the non-human world (Jones and Cloke, 2002; Whatmore and Hinchliffe, 2003; Braun, 2005). However, in contrast to what we might gloss as post-humanist approaches, Plumwood retains the concepts of nature and natural systems. She rejects concepts such as 'naturecultures' that aim to implode the distinction between the two, arguing that rejecting hyperseparation is not to reject difference or distinguishability:

> What is lost when we refuse to acknowledge difference between nature and culture, or

> when we accept an idealist or social constructionist reduction of nature to culture? There may be a range of situations in which they are hard to separate, but there are an important range of others in which recognizing their difference is crucial. (Plumwood, 2006: 21)

The idea of landscape as a bioculturally collaborative product is consistent with what we know of many indigenous realms of thought. For example, Rose writes of Australian indigenous philosophies:

> Subjectivity, in the form of consciousness, agency, morality and law, is part of all forms and sites of life: of non-human species of plants and animals, of powerful beings such as Rainbow Snakes, and of creation sites, including trees, hills and waterholes. Nourishing terrains are sentient. (Rose, 1999: 178)

It is not this sentience that has been recognized in management regimes called 'cultural landscapes', but indigenous beliefs that terrains are sentient. The chain of care thus passes through humans in an apparently contradictory way. Nevertheless it would be counterproductive to argue that the solution is to dismantle a land-management tool that has finally ceded albeit limited power to indigenous interests. Similarly, many would argue against too strong a critique of 'human impacts' just when George W. Bush might finally be getting it.

III From Other to Self

The ethnographic tradition and associated methodologies have always been important in cultural ecological frameworks. An important trend here is increasing interest in analysing cultures of the Self rather than the Other. In a North American context, where there is a long history of fieldwork in developing countries, Schroeder *et al*. (2006) describe this as 'discovering the Third World within?'.

In some situations this work draws explicitly on comparisons stimulated by work with indigenous peoples and environmental engagements (eg, Gill, 2005, on pastoralism; Trigger and Mulcock, 2005, on forests; Gibbs, 2006, and Jackson, 2006, on water). Others are engaging with environmental knowledges of hunters (Robbins, 2006), miners (Trigger, 1997) and ecosystem assessment technicians (Robertson, 2006). Everyday habits, practices and objects, and their implications for sustainability debates, have also been under scrutiny (see Shove, 2003, and Allon and Sofoulis, 2006, on water; Hobson, 2006, on bins and bulbs; Njeru, 2006, on plastic bags). The question of the usefulness of such knowledges, particularly in comparison to more policy-orientated society-environment research, is tackled by Gill (2006).

There are strong connections here to a linked set of debates around the socio-environmental connections between urban and rural areas, in which the urban/rural dualism is understood as just as problematic as, and connected to, the culture/nature one. Clear illustrations are seen in discussions of the cultures and ecologies of food in the west (Freidberg, 2003; Bryant and Goodman, 2004; Goodman, 2004; Jackson *et al*., 2006). This theme will be explored in more detail in a future report.

There are of course many dimensions of the Other. Using successive editions of *The dictionary of human geography* as her data source, Setten (2005) argues that very strong Nordic traditions of landscape geography have been almost ignored although written in English. Setten encapsulates this perspective as having a focus on 'people's customary engagement with the land constituted through temporal and spatial practices' (2005: 6; see also Olwig, 2003). It potentially conceptualizes the human rather differently to the visual landscape tradition of Anglo human geography or the North American cultural landscape tradition. Indeed, in the Swedish context human ecology is institutionalized as a separate discipline. Important recent overview volumes are Hornborg and Palsson (2002) and Peil and Jones (2005).

Swedish work provides particularly interesting examples of the tensions in the

differential positioning of the human. On the one hand is a historical approach to National Parks that excludes or is at least deeply ambivalent towards humans and their history (Mels, 1999; 2002), similar to the wilderness ideal in postcolonial contexts such as North America, New Zealand and Australia. As in these other parts of the world this ideal excludes indigenous Saami people, except in so far as they can be seen as part of a pure nature (Beach, 2001; 2004; Adams, 2006). On the other hand is an interest in local environmental knowledges, particularly among farmers, that sees people as deeply integrated in socio-natural systems (Stenseke, 2006). Further, some agricultural activities such as mowing and grazing are seen not as a threat to biodiversity, but necessary for its maintenance (see also Pykälä, 2000, and Pleininger *et al*., 2006, on these themes in northern and central Europe more generally).

IV Protected areas with people in them

To open a conversation space where humans in the first world can be conceptualized as a force for environmental good as well as destruction (Vos and Meekes, 1999) is to continue the positive steps that have begun with the inclusion of people in protected areas in the developing world (Zimmerer, 2006). This is not just an intellectual but a practical need.

An interesting contrast here is between World Heritage sites and Man and the Biosphere (MAB) areas, both under the auspices of the UN. World Heritage is conservative in the sense of trying to preserve things from the past, if not unchanged, at least with integrity comparable to the original. Man and the Biosphere areas, on the other hand, are about processes, and explicitly include people. Biosphere reserves are described as 'both concept and tool' (UNESCO, 2002: 1). They are places where 'the emphasis is on humans as an integral and fundamental part of the biosphere' (p. 1). In other words, they seek to reverse the practices of much protected area management that seek to exclude local peoples. They have three complementary functions; conservation of biodiversity, fostering of sustainable economic and human development, and a logistic function encompassing education, monitoring and research. They are explicitly positioned as a contrast to the 'closed jar' approach of sealing off nature from the human world (p. 2).

A good recent example of a Biosphere Reserve is Kristianstads Vattenrike, in the southern Swedish province of Skåne. Encompassing the lower drainage basin of River Helge and adjacent coastal waters in the Baltic Sea, the area includes diverse wetland environments of high biological value. For example, it contains 711 species nationally red-listed by Sweden and at least 22 species in the IUCN Red List. It is situated in the most densely populated region of Sweden with a highly developed agricultural sector. However, there is a town of 30,000 people at the heart of the reserve. For the town of Kristianstad, the watery environment provided by the surrounding lakes, river and high groundwater levels is both threat and opportunity. This ambiguous relationship with water has been central to the town's identity since its establishment in the seventeenth century, in ways comparable to the low-lying areas of the Netherlands to the south. Magnusson (2004) outlines shifts in thinking about the wetlands; from waterlogged (*vattensjuk*) to a water kingdom (*vattenrike*).

If a biosphere reserve is 'a laboratory for sustainability' (Alfsen-Norodom, 2004: 4), and current examples include not only towns such as Kristianstad but also the urbanized area of Lanzarote in Spain (Dogse, 2004), then there is no necessary reason why a major city should not also become a Biosphere Reserve. Indeed there is now considerable discussion about whether cities such as New York, Rome, Dar es Salaam, Seoul and Sao Paulo could be conceptualized and managed as Biosphere Reserves (see contributions in Alfsen-Norodom *et al*., 2004b, including Alfsen-Norodom *et al*., 2004a, on

New York). Such thinking seems bizarre if we continue to think of nature as existing 'out there', somewhere remote from human activity. On the other hand, it is quite consistent with the idea that cities are just as much ecosystems as any other area, or if we consider the many ways cities are networked into broader ecosystem processes, such as those that supply water (Gandy, 2002; Kaika, 2005). These debates seem to have taken to heart David Harvey's famous argument that 'in a fundamental sense, there is nothing *unnatural* about New York city' (Harvey, 1996: 186).

V What are the ecologists doing with the human?

Although ecology would in theory claim a holistic remit that includes humans as part of earth's biota, its usual practice has reinforced humans as different (Haila, 1999; 2000), with anthropologists more likely to consider humans within an explicitly biogeographical perspective (Terrell, 2006). A recent contents analysis of mainstream conservation biology journals shows a continued focus on relatively 'intact' habitats, with few studies 'conducted entirely in areas under intense human pressure (agricultural landscapes, coastal and urban areas)' (Fazey *et al*., 2005: 70).

Changes can be seen as part of the so-called 'new ecology', or 'non-equilibrium' ecology, in which change and contingency rather than stability is the norm, and 'disturbances' such as fire and human actions are understood as internal to the system rather than external (Stott, 1998; Zimmerer and Young, 1998; Low, 2003; Wallington *et al*., 2005). For example, new journals such as *Urban Ecosystems* focus specifically on 'human' environments, acknowledging that:

> From a scientific perspective, urban and suburban landscapes have been understudied and underutilized by ecologists throughout the world. The reasons for this are many, but the primary underlying cause can be attributed to the reluctance of ecologists to work in areas dominated by humans. (McDonnell, 1997: 85)

(See also Gaston, 2004; Head and Muir, 2006.) Within the growing field of urban ecology (Pickett *et al*., 2004; Kark *et al*., 2007) there is emerging recognition that both urban ecosystems and the co-option of human actors are likely to be crucial to biodiversity conservation. For example, urban areas harbour high levels of species diversity due to the richness and diversity of habitats (Niemela, 1999), although human management regimes may be a stronger factor (Pickett *et al*., 2001; Thompson *et al*., 2003). Rudd *et al*. (2002) showed that the optimal configuration of habitat networks in Greater Vancouver would need to include back yards. Savard *et al*. (2000) recognized the importance of private home-owners in relation to bird habitat.

The discussions above offer productive arenas of interchange with the attention being paid in geography to urban natures (Braun, 2005). A further point of connection is with the work of Hobbs *et al*. (2006) who recently put forward the concept of 'novel ecosystems' or 'emerging ecosystems' in which, as a response to human action, species occur in combinations and relative abundances new to a particular biome. (These are differentiated from modified ecosystems that require human maintenance to continue, such as agricultural systems.) Examples of novel ecosystems include the rain-shadow tussock grasslands of New Zealand, Puerto Rico's 'new' forests and salt-tolerant communities in salinized areas of southern Australia that combine native and alien species (Hobbs *et al*., 2006).

Much of this work is coming out of restoration ecology, in which workers are grappling with the hybrid (native and exotic) ecosystems of mostly postcolonial contexts. In Australia ecologists working in areas with a visible and influential Aboriginal presence are moving away from a default assumption of an environment without people (eg, Murphy and Bowman, 2007). Others are writing reflectively on their own engagements with land (Kirkpatrick, 2006).

An apparent blind spot to thinking critically about the role of humans has been the growing field of macroecology, which focuses on processes operating at large spatial and temporal scales (Gaston, 2004; 2006). Gaston argues that:

> A reading of the vast majority of the macroecological literature would provide little suggestion that human activities could or did have influences on macroecological patterns or processes. (Gaston, 2006: 258)

He discusses a number of reasons for this and shows how the field is changing to increasingly recognize the detailed and variable roles of human activity.

An integrative brand of ecology is practised by the Resilience Alliance,[2] published mostly in their journal *Ecology and Society*. The Alliance works through interdisciplinary collaborations to explore the dynamics of social-ecological systems, using key concepts such as resilience, adaptability and transformability. The approach is avowedly integrative of 'ecology' and 'society' (eg, Gunderson *et al*., 2005) and acknowledges the pervasiveness of humans in ecosystems (Elmqvist *et al*., 2003; Folke *et al*., 2004; Trosper, 2005). Yet the assumption of separate systems remains curiously unexamined in this work. Further there is conceptual slippage between treating humans as different, and ultimately absorbing all human activities as part of ecosystems.

An interesting albeit small trend within ecological writings is that which addresses questions of social construction, for example in what constitutes a species (Hey, 2006) and differential values placed on different types of endangered species (Czech *et al*., 1998).

VI Terms of engagement

As an intellectual container, 'cultural ecology' is fraught with the same conceptual and ontological problems – what Anderson (2005: 280) calls 'the stale binaries' – that attend human impacts, cultural landscapes, indeed human and physical geographies. Yet the rich, detailed and diverse empirical material in evidence at the moment contradicts this in the doing. So perhaps we should be confident that in the public conversations we shall be known best by our works. Our students will be most effective if they can both groundtruth the satellite image of coastal vegetation and explain why the tsunami was experienced very differently by subsistence fishers living on a different coastal edge. To '*begin* … by assuming a radical or pure break between humanity and animality' (Anderson, 2005: 271) is a rather different thing to demonstrating spatially and temporally variable differences in the ecological roles of specific peoples and groups of non-humans, or showing, using a battery of diverse methodologies, how culturally variable associations of humans and animals have influenced the patterning of plant communities. It is to this body of work I will return in more detail in future reports, while continuing to take issue with the terms of engagement.

Notes

1. In his conclusion to *Collapse* Jared Diamond, often seen as a latter-day environmental determinist, argues that environmental solutions require 'a willingness to reconsider core values' (2005: 522).
2. http://www.resalliance.org/ (last accessed 9 May 2007).

References

Adams, M. 2006: Beyond Yellowstone? Conservation and indigenous rights in Australia and Sweden. In Cant, G., Goodall, A. and Inns, J., editors, *Discourses and silences: indigenous peoples, risks and resistance*, Christchurch: Department of Geography, University of Canterbury.

Alfsen-Norodom, C. 2004: Urban biosphere and society: partnership of cities – introduction. *Annals of the New York Academy of Science* 1023, 1–9.

Alfsen-Norodom, C., **Boehme, S.E., Clemants, S., Corry, M., Imbruce, V., Lane, B.D., Miller, R.B., Padoch, C., Panero, C.M., Peters, C., Rosenzweig, C., Solecki, W.** and **Walsh, D.** 2004a: Managing the megacity for global sustainability: the New York metropolitan region as an urban biosphere reserve. *Annals of the New York Academy of Science* 1023, 125–41.

Alfsen-Norodom, C., Lane, B.D. and **Corry, M.**, editors 2004b: Urban biosphere and society: partnership of cities. *Annals of the New York Academy of Science* Special Issue, 1023.

Allon, F. and **Sofoulis, Z.** 2006: Everyday water: cultures in transition. *Australian Geographer* 37, 45–55.

Anderson, K. 2005: Griffith Taylor Lecture, Geographical Society of New South Wales, 2004: Australia and the 'State of Nature/Native'. *Australian Geographer* 36, 267–82.

— 2006: *Race and the crisis of humanism*. London: Routledge.

Beach, H. 2001: World Heritage and indigenous peoples – the example of Laponia. In Sundin, B., editor, *Upholders of culture past and present*, Stockholm: Royal Swedish Academy of Engineering Sciences (Kungl. Ingenjörsvetenskapsakademien-IVA), Elanders Gotab, 90–98.

— 2004: Political ecology in Swedish Saamiland. In Anderson, D. and Nuttall, M., editors *Cultivating Arctic landscapes. Knowing and managing animals in the circumpolar north*, New York: Berghahn Books, 110–23.

Braun, B. 2005: Environmental issues: writing a more-than-human urban geography. *Progress in Human Geography* 29, 635–50.

Bryant, R.L. and **Goodman, M.K.** 2004: Consuming narratives: the political ecology of 'alternative' consumption. *Transactions of the Institute of British Geographers* NS 29, 344–66.

Castree, N. 2004: Economy and culture are dead! Long live economy and culture! *Progress in Human Geography* 28, 204–26.

Czech, B., Krausman, P.R. and **Borkhataria, R.** 1998: Social construction, political power, and the allocation of benefits to endangered species. *Conservation Biology* 12, 1103–12.

Diamond, J. 2005: *Collapse. How societies choose to fail or survive*. London: Penguin.

Dogse, P. 2004: Toward urban biosphere reserves. *Annals of the New York Academy of Science* 1023, 10–48.

Elmqvist, T., Folke, C., Nyström, M., Peterson, G., Bengtsson, J., Walker, B. and **Norberg, J.** 2003: Response diversity, ecosystem change, and resilience. *Front. Ecol. Environ.* 1: 488–94.

Fazey, I., J. Fischer, and **D. B. Lindenmayer.** 2005:. What do conservation biologists publish? *Biological Conservation* 124, 63–73.

Folke, C., Carpenter, S., Walker, B., Scheffer, M., Elmqvist, T., Gunderson, L. and **Holling, C.S.** 2004: Regime shifts, resilience, and biodiversity in ecosystem management. *Annual Review of Ecology Evolution and Systematics* 35, 557–81.

Franklin, A. 2006: Burning cities: a posthumanist account of Australians and eucalypts. *Environment and Planning D: Society and Space* 24, 555–76.

Freidberg, S. 2003: Not all sweetness and light: new cultural geographies of food. *Social and Cultural Geography* 4, 3–6.

Gandy, M. 2002: *Concrete and clay: reworking nature in New York City*. Cambridge, MA: MIT Press.

Gaston, K.J. 2004: Macroecology and people. *Basic and Applied Ecology* 5, 303–307.

— 2006: Biodiversity and extinction: macroecological patterns and people. *Progress in Physical Geography* 30, 258–69.

Gibbs, L. 2006: Valuing water: variability and the Lake Eyre Basin, central Australia. *Australian Geographer* 37, 73–85.

Gill, N. 2005: Aboriginal pastoralism, social embeddedness, and cultural continuity in central Australia. *Society and Natural Resources* 18, 699–714.

— 2006: What is the problem? Usefulness, the cultural turn, and social research for natural resource management. *Australian Geographer* 37, 5–17.

Goodman, M.K. 2004: Reading fair trade: political ecological imaginary and the moral economy of fair trade foods. *Political Geography* 23, 891–915.

Goudie, A. 2006: *The human impact on the natural environment* (sixth edition). Oxford: Blackwell.

Gunderson, L., Folke, C. and **Janssen, M.** 2005: Integrating ecology and society to navigate turbulence. *Ecology and Society* 10, 39. Retrieved 9 May 2007 from http://www.ecologyandsociety.org/vol10/iss1/art39/

Haila, Y. 1999: Socioecologies. *Ecography* 22, 337–48.

— 2000: Beyond the nature-culture dualism. *Biology and Philosophy* 15, 155–75.

Harvey, D. 1996: *Justice, nature and the geography of difference*. Oxford: Blackwell.

Head, L. and **Muir, P.** 2006: Edges of connection: reconceptualizing the human role in urban biogeography. *Australian Geographer* 37, 87–101.

Hey, J. 2006: On the failure of modern species concepts. *Trends in Ecology and Evolution* 21, 447–50.

Hobbs, R.J., Arico, S., Aronson, J., Baron, J.S., Bridgewater, P.B., Cramer, V.A., Epstein, P.R., Ewel, J.J., Klink, C.A., Lugo, A.E., Norton, D., Ojima, D., Richardson, D.M., Sanderson, E.W., Valldares, F., Vila, M., Zamora, R. and **Zobel, M.** 2006: Novel ecosystems: theoretical and management aspects of the new ecological world order. *Global Ecology and Biogeography* 15, 1–7.

Hobson, K. 2006: Bins, bulbs and shower timers: on the techno-ethics of sustainable living. *Ethics, Place and Environment* 9, 335–54.

Hornborg, A. and **Palsson, G.**, editors 2002: *Negotiating nature: culture, power and environmental argument*. Lund: Lund University Press.

IPCC 2007: *Climate Change 2007: Climate Change Impacts, Adaptation and Variability. Summary for Policymakers*. Working Group II Contribution to the Intergovernmental Panel on Climate Change Fourth

Assessment Report. Retrieved 9 May 2007 from http://www.ipcc.ch/

Jackson, P., Ward, N. and **Russell, P.** 2006: Mobilizing the commodity chain concept in the politics of food and farming. *Journal of Rural Studies* 22, 129–41.

Jackson, S. 2006: Compartmentalizing culture: the articulation and consideration of indigenous values in water resource management. *Australian Geographer* 37, 19–31.

Jones, O. and **Cloke, P.** 2002: *Tree cultures*. Oxford: Berg.

Kaika, M. 2005: *City of flows. Modernity, nature, and the city*. London: Routledge.

Kark, S. Iwaniuk, A., Schalimtzek, S. and **Banker, E.** 2007: Living in the city: can anyone become an 'urban exploiter'? *Journal of Biogeography* 34, 638–51.

Kirkpatrick, J.B. 2006: *The ecologies of paradise. Explaining the garden next door*. Hobart: Pandani Press.

Low, T. 2003: *The New Nature*. London: Penguin.

Magnusson, S.-E. 2004: The changing perception of the westlands in and around Kristinastad, Sweden. From waterlogged areas toward a future water kingdom, Kristianstads Vattenrike Biosphere Reserve. *Annals of the New York Academy of Science* 1023, 323–27.

McDonnell, M.J. 1997: A paradigm shift. *Urban Ecosystems* 1, 85–86.

Mels, T. 1999: *Wild landscapes: the cultural nature of Swedish National Parks*. Lund: Lund University Press.

— 2002: Nature, home and scenery: the official spatialities of Swedish National Parks. *Environment and Planning D: Society and Space* 20, 135–54.

Murphy, B.P. and **Bowman, D.M.J.S.** 2007: The interdependence of fire, grass, kangaroos and Australian Aborigines: a case study from central Arnhem Land, northern Australia. *Journal of Biogeography* 34, 237–50.

Niemela, J. 1999: Ecology and urban planning. *Biodiversity and Conservation* 8, 119–31.

Njeru, J. 2006: The urban political ecology of plastic bag waste problem in Nairobi, Kenya. *Geoforum* 37, 1046–58.

Olwig, K.R. 2003: In search of the Nordic landscape: a personal view. In Öhman, J. and Simonsen, K., editors, *Voices from the north. New trends in Nordic human geography,* Ashgate: Aldershot, 211–32.

Peil, T. and **Jones, M.**, editors 2005: *Landscape, law and justice*. Oslo: Institute for Comparative Research in Human Culture.

Pickett, S.T.A., Cadenasso, M.L. and **Grove, J.M.** 2004: Resilient cities: meaning, models, and metaphor for integrating the ecological socio-economic, and planning realms. *Landscape and Urban Planning* 69, 369–84.

Pickett, S.T.A., Cadenasso, M.L., Grove, J.M., Nilon, C.H., Pouyat, R.V., Zipperer, W.C. and **Costanza, R.** 2001: Urban ecological systems: linking terrestrial ecological, physical, and socioeconomic components of metropolitan areas. *Annual Review of Ecology and Systematics* 32, 127–57.

Plieninger, T., Höchtl, F. and **Spek, T.** 2006: Traditional land-use and nature conservation in European rural landscapes. *Environmental Science and Policy* 9, 317–21.

Plumwood, V. 2006: The concept of a cultural landscape: nature, culture and agency of the land. *Ethics and the Environment* 11, 115–50.

Pykälä, J. 2000: Mitigating human effects on European biodiversity through traditional animal husbandry. *Conservation Biology* 14, 705–12.

Robbins, P. 2006: The politics of barstool biology: environmental knowledge and power in greater Northern Yellowstone. *Geoforum* 37, 185–99.

Robertson, M.M. 2006: The nature that capital can see: science, state, and market in the commodification of ecosystem services. *Environment and Planning D: Society and Space* 24, 367–87.

Rose, D.B. 1999: Indigenous ecologies and an ethic of connection. In Low, N., editor, *Global ethics and environment*, London: Routledge, 175–87.

Rudd, H., Vala, J. and **Schaefer, V.** 2002: Importance of backyard habitat in a comprehensive biodiversity conservation strategy: a connectivity analysis of urban green spaces. *Restoration Ecology* 10, 368–75.

Savard, J.-P., Clergeau, L.P. and **Mennechez, G.** 2000: Biodiversity concepts and urban ecosystems. *Landscape and Urban Planning* 48, 131–42.

Schroeder, R.A., St Martin, K. and **Albert, K.E.** 2006: Political ecology in North America: discovering the third world within? *Geoforum* 37, 163–68.

Setten, G. 2005: Who owns the concepts? Notes on the product, practice, property and power of writing. In Peil, T. and Jones, M., editors, *Landscape, law and justice*, Oslo: Institute for Comparative Research in Human Culture, 3–13.

Shove, E. 2003: *Comfort, cleanliness and convenience*. Oxford: Berg.

Stenseke, M. 2006: Biodiversity and the local context: linking seminatural grasslands and their future use to social aspects. *Environmental Science and Policy* 9, 350–59.

Stott, P. 1998: Biogeography and ecology in crisis: the urgent need for a new metalanguage. *Journal of Biogeography* 25, 1–2.

Terrell, J.E. 2006: Human biogeography: evidence of our place in nature. *Journal of Biogeography* 33, 2088–98.

Thomas, W.L., editor 1956: *Man's role in changing the face of the Earth*. Chicago: University of Chicago Press.

Thompson, K., Austin, K.C., Smith, R.M., Warren, P.H., Angold, P.G. and **Gaston, K.J.** 2003: Urban domestic gardens (I): putting small-scale plant diversity in context. *Journal of Vegetation Science* 14, 71–78.

Trigger, D. 1997: Mining, landscape and the culture of development ideology in Australia. *Ecumene* 4, 161–80.

Trigger, D. and **Griffiths, G.**, editors 2003: *Disputed territories: land, culture and identity in settler societies*. Hong Kong: Hong Kong University Press.

Trigger, D. and **Mulcock, J.** 2005: Forests as spiritually significant places: nature, culture and belonging in Australia. *The Australian Journal of Anthropology* 16, 306–20.

Trosper, R.L. 2005: Emergence unites ecology and society. *Ecology and Society* 10(1), article 14. Retrieved 9 May 2007 from http://www.ecologyandsociety.org/vol10/iss1/art14/

UNESCO 2002: *Biosphere reserves: special places for people and nature*. Paris: UNESCO.

Vitousek, P.M., Mooney, H.A., Lubchenco, J. and **Melillo, J.M.** 1997: Human domination of earth's ecosystems. *Science* 277, 494–99.

Vos, W. and **Meekes, H.** 1999: Trends in European cultural landscape development: perspectives for a sustainable future. *Landscape and Urban Planning* 46: 3–14.

Wallington, T.J., Hobbs, R.J. and **Moore, S.A.** 2005: Implications of current ecological thinking for biodiversity conservation: a review of the salient issues. *Ecology and Society* 10(1), article 15. Retrieved 9 May 2007 from http://www.ecologyandsociety.org/vol10/iss1/art15/

Whatmore, S. and **Hinchliffe, S.** 2003: Living cities: making space for urban nature. *Soundings* 22, 137–50.

Zimmerer, K.S. 2006: Cultural ecology: at the interface with political ecology – the new geographies of environmental conservation and globalization. *Progress in Human Geography* 30, 63–78.

— 2007: Cultural ecology (and political ecology) in the 'environmental borderlands': exploring the expanded connectivities within geography. *Progress in Human Geography* 31, 227–44.

Zimmerer, K.S., and **Young, K.R.**, editors 1998: *Nature's geography. New lessons for conservation in developing countries*. Madison, WI: University of Wisconsin Press.