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# Re-establishing an Ecological Discourse in the Debate over the Value of Ecosystems and Biodiversity

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# Re-establishing an Ecological Discourse in the Debate over the Value of Ecosystems and Biodiversity

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**Abstract:**

The approach of conceptualizing biodiversity and ecosystems as goods and services to be represented by monetary values in policy is being championed not just by economists, but also by ecologists and conservation biologists. This new environmental pragmatism is now being pushed forward internationally under the guise of hardwiring biodiversity and ecosystems services into finance. This conflicts with the realisation that biodiversity and ecosystems have multiple incommensurable values. The current trend is to narrowly define a set of instrumental aspects of ecosystems and biodiversity to be associated with ad hoc money numbers. We argue that ecosystem science has more to offer the policy debate than pseudo-economic numbers based on assumptions that do not reflect ecological or social complexity. Re-establishing the ecological discourse in biodiversity policy implies a crucial role for biophysical indicators as policy targets e.g., the Nature Index for Norway. Yet there is a recognisable need to go beyond the traditional ecological approach to create a social ecological economic discourse. This requires reviving and relating to a range of alternative ecologically informed discourses (e.g. intrinsic values, deep ecology, ecofeminism) in order to transform the increasingly dominant and destructive relationship of humans separated from and domineering over Nature.

**Keywords:**
Economic valuation, Intrinsic value, Pragmatism, Social ecological economics, Ecosystems, Biodiversity

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## 1. Introduction

The United Nations (UN) Convention on Biological Diversity (CBD) identifies five main direct threats to biodiversity globally: habitat loss and degradation, invasive alien species, pollution and nutrient load, overexploitation and unsustainable use, and climate change. At the tenth meeting of the Conference of the Parties to the CBD held in Nagoya, Aichi Prefecture, Japan, 18-29 October 2010 new ambitious targets were set. For example, one target is that "By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced" (UNEP Convention on Biodiversity, 2010). How biodiversity values are expressed is crucial in determining how society formulates the necessary plan of action.

The conservation discourse has been changing and evolving in response to political pressures and there are divisions over how it should be conducted (Adams, 2004; Hutton et al., 2005; Peterson et al., 2010). This paper explores the tension over the use of financially oriented and market-based discourses that have increasingly overshadowed earlier attempts to express a much richer understanding of biodiversity and ecosystems values (Child, 2009; McCauley, 2006; Robinson, 2011). In 1982 the UN World Charter for Nature expressed the need for protecting nature without translation to economic values and made explicit the idea of living in harmony with nature in ethical terms. The Charter explicitly recognised that:

> "Every form of life is unique, warranting respect regardless of its worth to man, and, to accord other organisms such recognition, man must be guided by a moral code of action" (UN World Charter for Nature, 1982).

The concepts of ecosystems functioning and structure that originated within an ecological discourse maintained the potential for a deep understanding and respect for Nature. However, recent policy framing has undermined the idea that humans have an ethical

responsibility for protecting those that are morally considerable. Following the 2003 Millennium Ecosystem Assessment (MEA) the term "ecosystem service" became widespread and increasingly gained influence as a central policy metaphor. The MEA (2005) classification separates services into provisioning, supporting, regulating and cultural, where the last includes the spiritual. Further divisions have then been employed in order to value ecosystems services in monetary terms. Clearly, such "classification is inherently somewhat arbitrary" (Brauman et al., 2007 p.69). The goods and services approach also involves an implicit objectification and commodification leading towards a narrow perception of Nature and its worth. Indeed environmental values are then increasingly reduced to human preferences. Most recently the UN, European Commission and branches of various governments (German, Norwegian, Swedish, Japanese) have supported an international initiative to establish *The Economics of Ecosystems and Biodiversity* (TEEB).

Engagement by ecologists and conservation biologists in this economic form of policy discourse represents a new environmental pragmatism (Spash, 2008b, 2009). This neglects principled concerns over the loss of wild Nature and biodiversity and relegates scientific understanding to the backseat. The pragmatic drive shows little concern for theoretical validity in value estimation or the limited role of human preferences as determinants of values, while also downgrading attention to ecosystem complexity. The new environmental pragmatists are therefore different from the environmental economists employing cost-benefit methods based upon economic welfare theory.

This paper critically reflects upon the framing of biodiversity policy as being pursued by high profile ecologists and conservation biologist and under UN initiatives. We differentiate and explain the various approaches to biodiversity policy and ecosystems management. Next, in Section 2, we reflect upon the traditional ecological approach and exemplify how it can contribute to policy via biophysical indicators. However, we also argue

that ecologists and conservation biologist are in danger of being swamped by the drive for switching into a financial and economic discourse. The drive for new environmental pragmatism is discussed in Section 3. We argue that the ecological approach can better represent a diversity of qualities of Nature and should maintain its own validity through refusing to change its core concepts and language. At the same time the need to engage in the policy process requires a new approach which we describe in terms of the literature in social ecological economics. This is described in Section 4. The approach requires respecting the richness of human relationships with Nature, accepts complexity and uncertainty and calls for an inclusive social and economic policy process and institutions able to articulate plural values. We see this as reviving core elements of an earlier ecological discourse but also redefining the traditional approach to science-policy.

## 2. The Framing of Biodiversity Policy

Whether ecosystem and biodiversity policy is framed from an ecological or economic perspective, the fundamental question is: Why should Nature be protected? This question is logically prior to setting policy targets. The economic perspective emphasizes the possibilities of substituting ecosystems structure and functioning, and biodiversity, using technology, and emphasises the redundancy of Nature in light of other more valued human demands. This approach can be criticised for neglecting the limits to and uncertainty of substitution. Ecologists helped establish the importance of natural systems as a fundamental basis for the survival and health of humanity. From this perspective the critical vulnerability of biodiversity and ecosystems acts as a limiting factor on human activity. Public policy needs to take into account the risks we take by destroying and degrading the richness and ability to function of natural systems.

The complexity of the relationship between ecosystem services and the biodiversity that supports them raise numerous challenges for conceptualization and practical policy implementation (Mace et al., 2011). Asking how much biodiversity is needed to maintain key ecosystem processes is insufficient. When ecosystems processes are subject to disturbance or shocks, biodiversity provides for both stability (resistance) and recovery (resilience). The diversity of numerous species with similar capabilities provides for ecosystem stability as well as optimal functioning. Long-term adaptations of ecosystems to changes in climate and other environmental variables are strongly dependent upon available biodiversity (Christensen et al., 1996).

Economists define ecosystem functions as the capacity to provide goods and services and mainly value ecosystems by the willingness to pay of individual's for tangible and recognised outputs. In contrast ecologists define ecosystem functions as biophysical system traits, independent of human preferences (Lubchenco et al., 1991). Ecosystem management does not then focus primarily on the delivery of goods and services for human use, but rather on the sustainability of ecosystem structure and process. Under a traditional ecological approach:

> "Ecosystem management is management driven by explicit goals, executed by policies, protocols, and practices, and made adaptable by monitoring and research based on our best understanding of the ecological interactions and processes necessary to sustain ecosystem structure and function". (Christensen et al., 1996 p.669)

This involves a specific philosophy of science which tends to include such elements as belief in objective truth, separation of facts from values and designation of expert judgment as independent from political process. While such positions are contentious in themselves, the overall thrust of the scientifically informed approach is quite powerful.

The Nature Index for Norway provides a recent example of a traditional ecological approach being put into practical use for policy. This is a comprehensive integrated management tool combining 300 biodiversity indicators and aiming to inform management targets (Certain et al., 2011). For each indicator the current state is compared to a reference, representing a given interpretation of intact ecosystems. The ideal reference state or highest quality environment, is unlikely to be a policy target for biodiversity because of human interaction with and use of ecosystems. Hence, there is a crucial distinction between a reference value and an environmental management target, aimed at representing an acceptable level of intervention in ecosystems structure and functioning.

The index appeals to three information sources namely expert opinion, models and monitoring data (Certain et al., 2011). The Nature Index was established in an interdisciplinary scientific communication process involving 125 experts in ecology and conservation biology. The approach follows a traditional ecosystems management approach but is also innovative in explicitly addressing uncertainty and attempting expert forecasting 10 years into the future (to 2020). Uncertainty was dealt with by asking the expert to give an explicit evaluation of the degree of uncertainty in the data provided. Eliciting an overview of biodiversity is a complex process involving discussions about concepts, methods, uncertainties and values, and this complexity permeates the construction of the index far beyond being a technical exercise (Aslaksen et al., 2012). Challenging the experts to adopt a forward-looking approach is a first step to enhance the knowledge basis for “early warnings” to be applied for precautionary policies. The Nature Index exemplifies how a biophysical indicator can make Nature visible for policy makers without having to rely on quantification in economic or financial terms.

Yet, maintaining an independent ecologically informed policy discourse is something which has become increasingly difficult.

> "For years there has been a debate among scientists and policymakers/politicians on the usefulness of aggregating biodiversity parameters and indicators into indices. Scientists are concerned with detail, reliability, replicability, accuracy, etc, whereas high-level politicians are interested in the broad picture, the key message, preferably a value of biodiversity condensed in one figure on a scale from 0 to 10. Curiously these discussions are hardly present in the economic field. Curiously experts in the socioeconomic field have been able to establish these information systems in nearly all countries, while ecologist failed in nearly all countries. To my opinion it is not because economy is less difficult and complex than ecosystems to describe and assess, because it is not. I think economists have a different attitude. While economists and policymakers speak the same language, ecological scientists appear to be in a different world, governed by different rules." (ten Brink, 2006 p.4)

The idea that ecology and conservation biology must compete with the power and prestige of economics has then led some to adopt the same language, "economizing ecology".

**3. An Economic and Financial Discourse**

The economic approach to the environment is essentially about the belief that all choices are trade-offs. In this mode of reasoning environmental economists contrast the benefits of any action, to say preserve or protect species, against the costs, of that protection. Costs here include opportunity costs, which mean the alternative possible use of resources. For example, a given land area for species preservation might be used for housing, roads, dumping waste or any number of human activities. The counter to development opportunities is then the benefits offered by Nature from an undisturbed environment. In order to include these benefits economists have been ever more inventive at creating concepts of value (e.g. direct use, indirect use, option, bequest and existence values) and methods for their

estimation (e.g. travel cost, hedonic pricing, production function analysis, contingent valuation, choice experiments). Over the last 50 years this research has encouraged extension of the categories of objects being assessed, moving from recreation and tourism, to air and water quality, to health and safety, to peace and quiet, to aesthetics, to the cultural and historical, and finally to ecosystems functions and biodiversity. On the journey, from assessing direct use values for recreation using travel cost methods to attributing existence values to biodiversity using choice experiments, the uncertainty has increased and validity, in all its forms (Spash and Vatn, 2006), diminished.

Despite severe limitations and numerous problems the methods of environmental cost-benefit analysis have been extended well beyond their theoretical bounds. This has done little to deter adoption of even cruder methods by natural scientists. Ecologists, such as Bob Costanza, Paul Ehrlich and Brian Walker, have collaborated with mainstream economists under the guise of an ecological economic approach at the Beijer Institute since the late 1980s. Two highly controversial studies, both with natural scientists as lead authors, have placed a monetary value on the World's ecosystems (Costanza et al., 1997) and all remaining wild Nature (Balmford et al., 2002). In the United States, the ecosystems services approach has been promoted by ecologists Paul Ehrlich and especially his student Gretchen Daily (Daily, 1997). The National Research Council (NRC) in the United States promoted the idea further with its study *Valuing Ecosystems Services: Toward Better Environmental Decision-Making* (Heal et al., 2005). The TEEB project is then the most recent in this line and the most international and widespread advocacy of the approach so far (European Communities, 2008; TEEB, 2010).

The TEEB study has been led by Pavan Sukhdev, a Managing Director in the Global Markets division at Deutsche Bank, who proudly prefaced the interim report with his personal philosophy of 'you cannot manage what you cannot measure' (European

Communities, 2008 p.6). Indeed the project proposes such things as intergenerational ethical issues being addressed by varying the discount rate, monetary valuation of ecosystem services based on the logic of the MEA categories (except possibly life support functions and 'spiritual values'), and 'benefit transfer' for all those difficult to find numbers (European Communities, 2008 pp.33-36). The expressed purpose of TEEB is to incorporate the economic values of Nature into decision making at all levels using market pricing (TEEB, 2010 p.3, p.14). The synthesis report states the intention of:

> "**creating a common language** for policymakers, business and society that enables the real value of natural capital, and the flows of services it provides, to become visible and be mainstreamed in decision making". (TEEB, 2010 p.24) [emphasis original]

TEEB employs the political rhetoric of "getting the price right" to allow markets to function efficiently. This involves explaining that, waste sinks have no cost for the private sector, and non-market benefits provide no reward to the market investor. In this neo-liberal framing private companies that destroy and pollute are innocent victims of a failing price system and cannot be blamed because they lack the right incentives for ecologically sustainable management. So we are told that, "Companies do not clear-cut forests out of wanton destructiveness or stupidity. On the whole, they do so because **market signals** [...] make it a logical and profitable thing to do" (TEEB, 2010 p.9) [emphasis original]. The economic framing is also advocated on the grounds that otherwise politicians will fail to take into account the 'right' values: "ignoring or undervaluing natural capital in economic forecasting, modelling and assessment can lead to public policy and government investment decisions that exacerbate the degradation" (TEEB, 2010 p.10).

The value estimates produced by TEEB, and the highly cited studies in Nature and Science led by ecologists, rely heavily on value transfer methods not original studies. For

example, estimates of a specific class of ecosystem may be taken from previous studies then averaged on a per hectare basis and applied to all such ecosystems no matter where or when. There is little attention to alternatives or problems (Spash and Vatn, 2006). The strong focus on financial values coming out of TEEB, and other UN initiatives, aims to promote economic growth and "capture values" for utility maximisation, rather than protect ecosystems, species or biodiversity. The monetization of ecosystems claims to show politicians the way to a 'green' economy: "investment in natural capital can create and safeguard jobs and underpin economic development, as well as secure untapped economic opportunities from natural processes and genetic resources." (TEEB, 2010 p.10). The motto is: "pro-biodiversity investment the logical choice".

This new environmental pragmatism makes ecosystems into commodities, or capital investments with a rate of return, in a way that provides corporations and financiers with business opportunities and intertwines the policy area of biodiversity and ecosystem protection with financial markets: "Hardwiring biodiversity and ecosystems services into finance" (UNEP Finance Initiative, 2010). It extends the mechanisms of carbon trading and expands financial instruments to create biodiversity banking and offset programs to trade financially in biodiversity loss (Spash, 2009, 2011). An indication of the treasure trove awaiting to be unlocked is the market for wetland credits is estimated at US$1.1-1.8 billion (TEEB, 2010 p.24).

## 4. Social Ecological Economics: A Transformative Discourse

Social ecological economics has in part developed as a response to the trend for expressing values of Nature predominantly in economic and monetary terms. This questions the assumptions underlying valuation work in environmental economics (O'Neill, 1993; Soma, 2006; Spash, 1995; Vatn and Bromley, 1994). The economic logic of imposing

commensurability and choices as trading-offs is that harm is treated as a financial cost that in principle can be compensated by payment. Good acts are those producing net gains once victims have been paid-off.

The use of simplistic value transfer methods, as in TEEB, is in itself highly problematic (Spash and Vatn, 2006). In addition, the approach contradicts the thrust of valuation theory in social ecological economics and replaces recognition of incommensurability and value pluralism (Martinez-Alier et al., 1998), with a universal monistic money measure (e.g., see criticism by Norton and Noonan, 2007). However, even within ecological economics new environmental pragmatism appeared forcefully with the Costanza et al. (1997) study. Advocates of ecosystem services valuation hold an implict model of human behvaiour and poltical process. Thus, Costanza states “I do not agree that more progress will be made by appealing to people’s hearts rather than their wallets” (Costanza, 2006: 749). In this case the model of human motivation is psychological egoism i.e., “the claim that people are incapable of regarding as important anything other than their own interests” (Holland, 1995: 30).

This runs counter to the evidence for multiple values and the motives behind environmental valuation (Spash, 1998, 2000b, c; Spash et al., 2009). In the context of work on contingent valuation of biodiversity and ecosystems the occurrence of refusals to trade-off, rights based beliefs and lexicographic preferences all bring into question the use of economic logic, let alone new environmental pragmatism. For example, on being given options between rights based and economic consequentialist motives for explaining their stated willingness to pay for wetland re-creation to protect bird species over 37% of respondents agreed with the statement: "Such endangered species need protection because they have a right to life which cannot be traded against economic considerations" (Spash, 2000a).

While rejection of the money motive and refusals to trade-off may seem strange and inexplicable to some ecologists, and most economists, they are in fact widely recognised in a variety of literatures. Similar concepts arise in terms of intrinsic values in philosophy, protected values in psychology and taboos in anthropology. Various religious and spiritual traditions respect sacred values (Bhagwat, 2009). Deep ecology suggests special protection for Nature as opposed to shallow ecology (Naess, 1973). Shallow ecology can be summarised as a fight against pollution and resource depletion, framing Nature in terms of instrumental values, with a central objective of health and affluence for the 'developed countries'. Deep ecology appeals to the intrinsic values of nature, suggesting a relationship between the human and nonhuman world reflecting an ethics of responsibility.

Promotion of a specific value articulating institution can then be seen to have unintended consequences. Money has a fundamental influence on human perception of value and may lead to crowding-out of policy options and non-market considerations. More than failing to reflect important values, a strong reliance on the monetary approach can be destructive e.g., undermining community values (Claro, 2007). At stake is the fundamental ethical concern over the commodification of nature: "If the valued goods that give richness to our lives are reduced to commodities, then what makes those lives meaningful is itself betrayed" (Funtowicz and Ravetz, 1994 p.197). The contradictions, conflicts and plurality of values require institutions which allow them to be expressed (Vatn, 2005).

Civilization has evolved at the cost of losing the "body's silent conversation with nature" (Abram, 1996). Losing the language of Nature, we are impaired in developing a language of ecology. Loss of beloved nature has been argued to lead to a psychological state of denial of that loss (Nicholson, 2002). This calls for a transformation of the approach to understanding our relationship with the natural world .

Modern environmental philosophy has been shown to resonate with the wisdom of ancient cultures, suggesting a reconsideration of how core elements of our humanity are shaped by the natural world (Abram, 1996). In indigenous cultures people viewed themselves as part of the wider community of Nature in active relationships with animals, plants, landscapes, mountains, rivers, wind and weather patterns, and it is only in recent centuries that humanity has come to think of Nature as "inanimate". The wisdom embedded in the relationship between the human-being and the non-human nature is not evident to Western-trained researchers—thus framing it in the context of "super-natural" powers, whereas in fact the source of wisdom is based on conviviality with nature, a recognition of the sentience of all nature and the continuity between humanity's physical and spiritual connection to nature (Abram, 1996 p.21).

Feminist philosophy and ecofeminism have drawn attention to how the cultural and societal devaluation of feminine and Nature values are intertwined (Merchant, 1980; Plumwood, 1993; Shiva, 1988). Feminist economists have pointed out the parallel between the economic and political invisibility of Nature and the invisibility of women's care work – echoed by the invisibility of indigenous cultures and of the poor (Mellor, 2005; Nelson, 1992; Waring, 1989). The economic conceptualization of Nature reflects a division or "hyperseparation" between humans and the non-human world (Plumwood, 1993). Nelson (1992) questions the implicitly gendered thinking about rationality, agency and values. The ideal model of economic choice, based on standard assumptions of rationality and agency, has a blind spot in its neglect of ecological limits to economic growth and of the relationships between the human-being and nature. The dualistic and hierarchical structure defines humans and nature, men and women, in opposition to each other.

A new transformative approach is called for that recognizes separation and individuation as well as connection and relation to others and the natural world, as fundamental to human identity and well-being.

> "A transformative feminism would involve a psychological restructuring of our attitudes and beliefs about ourselves and 'our world' (including the non-human world), and a philosophical rethinking of the notion of the self such that we see ourselves as both co-members of an ecological community and yet different from other members of it" (Warren, 1989 p.19)

A transformative approach integrates the social and economic approach with perspectives of ecology and sustainability – a vision of human society and nature in balance. Rather than the economy being seen as an independent entity a social ecological economic ontology recognises the hierarchical structure of reality in which economy is embedded in society which is in turn embedded in biophysical systems. "Apt though we are to lose sight of the fact, the primary objective of economic activity is the self-preservation of the human species" (Georgescu-Roegen, 1966 p.93).

**(Certain et al., 2011)**

**5. Comparing Different Discourses**

The framing of ecosystems and biodiversity as valuable because they provide goods and services is claimed to speak directly in the language of the political and policy community. This is also meant to be appealing to the general public who are characterised as only concerned about their wallets and motivated by a narrow self-interest. There is much conjecture in this position and a lack of reflection upon the literature covering human behaviour, environmental values, political science and institutions. Rhetorical statements are made as if they were self-evident facts, rather than as hypotheses to be explored. There are indeed several different competing discourses of which we have explored those of the

environmental economists, new environmental pragmatists, traditional ecologists and social ecological economists. Key points of these different perspectives are summarised in Table 1.

Environmental economic valuation is theoretically bound and problematic to apply, or inapplicable, in a variety of situations. Environmental change often violates the requirements for a fully informed choice over a marginal adjustment in quantity or quality of a well defined object which people readily accept as being subject to trade-offs in monetary terms. Standard economic valuation is then unable to address a range of factors such as non-marginal environmental change, conditions of strong uncertainty and ignorance, irreversibility and non-utilitarian ethics. However, questioning economic assumptions, as suggested by many social ecological economists, has for long been perceived as an out-of-bounds heretical activity, not a matter of scientific integrity. This is clear in attempts to change and reinterpret the empirical results coming from stated preference work under contingent valuation e.g., the exclusion of large numbers of respondents (Spash, 2008a). Indeed problems have not prevented new and innovative applications and methods in ever more uncertain areas, nor the development of simplistic and poorly validated value transfer methods.

New environmental pragmatism builds on this approach and goes a few steps further. This reduces the need for theory and raises the profile of specific political goals such as economic growth, employment, financial returns and wealth creation. Mainstream economics has attempted to avoid anything but pursuit of efficiency as a goal in order to lay claim to being scientific in the sense of physics. New environmental pragmatism has no such academic pretension and is purely oriented towards the continued expansion of a market-based economic system of capital accumulation. Ecosystems and biodiversity are then necessary only in so far as they create wealth and support the economic system.

A crucial role then exists for biophysical indicators as policy targets with the potential for informing the policy process and overcoming the duality between neglect of biodiversity

as policy issue and an economic discourse. The policy issues of wild Nature, ecosystems functions and the preservation of endangered species need to be placed in a different context than the financial market place. An example of the more traditional ecological approach is the Nature Index for Norway. This and similar approaches are necessary as a means for re-establishing the ecological discourse in policy.

At the same time we recognise the traditional ecological approach is not aimed at addressing social and economic aspects of ecosystems management and biodiversity loss. This is where a social ecological economics approach is required. A discourse which recognises explicitly the causes of biodiversity loss and ecosystems degradation, including political systems failure (despotism, corruption), greed, the industrial-military complex, political and economic power of multinational corporations, poverty, pressures on land use, and population growth. The complexity of society and the perceived urgency of biodiversity loss call for new areas of deliberation and public participation in addition to those of a representative democracy.

Fundamental uncertainties and ethical complexities call for reconsidering and extending the science-policy communication of biodiversity policy. This can be understood as an example of post-normal science because it "represents a range of urgent problems that require immediate attention but cannot be adequately addressed by current scientific knowledge or methods, relies heavily on practitioners who are not scientific experts, (an extended 'peer community'), where decisions made may have substantial repercussions regarding human lives and livelihoods, and in which laypersons from a range of backgrounds have a stake" (Francis and Goodman, 2010). Post-normal science proposes involvement and participation of stakeholders and citizens to inform the policy debate and improve the quality of policy deliberations (Funtowicz and Ravetz, 1994).

The mistaken presumption of new environmental pragmatism is that the global biodiversity crisis can be solved without major political will or institutional change. The prevailing use of the ecosystem service approach in the characterization of the biodiversity crisis is obscuring the ecological, economic, and political complexities. The policy instruments needed for biodiversity protection cannot solely be formulated as payment for ecosystems services, but need to be framed, interpreted, and implemented in an understanding that involves "a reconfiguration of state-market-community relationships" (Vatn, 2010).

## 6. Conclusions

The new environmental pragmatism being championed by some ecologist and conservation biologist and supported by the banking and finance community suggests using the wrong methods for wrong reasons. In biodiversity policy there are multiple incommensurable values in conflict. Oversimplification is not the answer, and single numbers are far from helpful for addressing complex problems. Economic theory has limitations, and supposed pragmatism which ignores them can only produce meaningless numbers for rhetorical purposes. Institutions which demand meaningless numbers are bad institutions. Ecological scientists have more to offer the ecosystems management and biodiversity policy debate than a set of such pseudo-economic financial numbers.

This is not to deny that the economic and financial discourse is powerful within society. Merely falling back on biophysical indicators is also not enough. Ecologists cannot ignore the alternative discourses in society but neither should they merely adopt an economic or banking and finance language as a pragmatic political strategy. There is a wider discourse in society which needs to be opened-up. Ecologist and conservation biologist can contribute, as they have done by in the past, by maintaining and improving knowledge of threats to and

the state of the environment. Even more importantly they can provide meaningful concepts for transforming the dominant destructive, isolationist and domineering relationship of humans to Nature.

**Literature Cited**


Abram, D., 1996. The Spell of the Sensuous: Perception and Language in a More-Than-Human World. Vintage Books.

Adams, W.M., 2004. Against Extinction: The Story of Conservation. Earthscan, London.

Aslaksen, I., Framstad, E., Funtowicz, S., Garnåsjordet, P.A., Nybø, S., Skarpaas, O., 2012. Reflections on communication processes of experts gathering biodiversity knowledge: The Nature Index for Norway. Norwegian Journal of Geography forthcoming.

Balmford, A., Bruner, A., Cooper, P., Costanza, R., Farber, S., Green, R.E., Jenkins, M., Jefferiss, P., Jessamy, V., Madden, J., Munro, K., Myers, N., Naeem, S., Paavola, J., Rayment, M., Rosendo, S., Roughgarden, J., Trumper, K., Turner, R.K., 2002. Economic reasons for conserving wild nature. Science 297, 950-953.

Bhagwat, S.A., 2009. Ecosystem services and sacred natural sites. Environmental Values 18, 417-428.

Brauman, K.A., Daily, G.C., Ka'eo Duarte, T., Monney, H.A., 2007. The nature and value of ecosystems services: An overview highlighting hydrological services. Annual Review of Environment and Resources 32, 67-98.

Certain, G., Skarpaas, O., Bjerke, J.-W., Framstad, E., Lindholm, M., Nilsen, J.-E., Norderhaug, A., Oug, E., Pedersen, H.-C., Schartau, A.-K., van der Meeren, G.I., Aslaksen, I., Engen, S., Garnåsjordet, P.A., Kvaløy, P., Lillegård, M., Yoccoz, N.G., Nybø, S., 2011. The Nature Index: A General Framework for Synthesizing Knowledge on the State of Biodiversity. PLoS ONE 6, 1-14.

Child, M.F., 2009. The Thoreau Ideal as a Unifying Thread in the Conservation Movement. Conservation Biology 23, 241-243.

Christensen, N.L., Bartuska, A.M., Brown, J.H., Carpenter, S., D'Antonio, C., Francis, R., Franklin, J.F., MacMahon, J.A., Noss, R.F., Parsons, D.J., Peterson, C.H., Turner, M.G., Woodmansee, R.G., 1996. The report of the Ecological Society of America committee on the scientific basis for ecosystem management. Ecological Applications 6, 665-691.

Claro, E., 2007. Exchange relationships and the environment: The acceptability of compensation in the siting of wastes disposal facilities. Environmental Values 16, 187-208.

Costanza, R., 2006. Nature: Ecosystems without commodifying them. Nature 443, 749.

Costanza, R., d'Arge, R., deGroot, R., Farber, S., Grasso, M., Hannon, B., Limburg, K., Naeem, S., ONeill, R.V., Paruelo, J., Raskin, R.G., Sutton, P., van den Belt, M., 1997. The value of the world's ecosystem services and natural capital. Nature 387, 253-260.

Daily, G.C., 1997. Nature's Services: Societal Dependence on Natural Ecosystems. Island Press, Washington, D C, p. 392.

European Communities, 2008. The Economics of Ecosystems and Biodiversity. European Communities, Brussels.

Francis, R.A., Goodman, M.K., 2010. Post-normal science and the art of nature conservation. Journal for Nature Conservation 18, 89-105.
Funtowicz, S.O., Ravetz, J.R., 1994. The worth of a songbird: Ecological economics as a post-normal science. Ecol. Econ. 10, 197-207.
Georgescu-Roegen, N., 1966. Analytical Economics. Cambridge University Press, Cambridge.
Heal, G.M., Barbier, E.E., Boyle, K.J., Covich, A.P., Gloss, S.P., Hershner, C.H., Hoehn, J.P., Pringle, C.M., Polasky, S., Segerson, K., Shrader-Frechette, K., 2005. Valuing Ecosystems Services: Toward Better Environmental Decision-Making. National Research Council, Washington, D.C.
Holland, A., 1995. The assumptions of cost-benefit analysis: A philosopher's view, in: Willis, K.G., Corkindale, J.T. (Eds.), Environmental Valuation: New Perspectives. CAB International, Wallingford, pp. 21-38.
Hutton, J., Adams, W.M., Murombedzi, J.C., 2005. Back to the barriers? Changing narratives in biodiversity conservation. Forum for Development Studies 2, 341-370.
Lubchenco, J., Olson, A.M., Brubaker, L.B., Carpenter, S.R., Holland, M.M., Hubbell, S.P., Levin, S.A., MacMahon, J.A., Matson, P.A., Melillo, J.M., Mooney, H.A., Peterson, C.H., Pulliam, H.R., Real, L.A., Regal, P.J., Risser, P.G., 1991. The sustainable biosphere initiative: An ecological research agenda. Ecology 72, 371-412.
Mace, G.M., Norris, K., Fitter, A.H., 2011. Biodiversity and ecosystem services: a multilayered relationship. Trends in Ecology and Evolution, 1445.
Martinez-Alier, J., Munda, G., O'Neill, J., 1998. Weak comparability of values as a foundation for ecological economics. Ecol. Econ. 26, 277-286.
McCauley, D.J., 2006. Selling out on nature. Nature 443, 27-28.
Mellor, M., 2005. Ecofeminist political economy: Integrating feminist economics and ecological economics. Feminist Economics 11, 120-126.
Merchant, C., 1980. The Death of Nature. Harper & Row.
Millennium Ecosystem Assessment, 2005. Ecosystems and Human Well-Being: Synthesis. Island Press, Washington, D.C.
Naess, A., 1973. Shallow and deep, long-range ecology movement: Summary. Inquiry: An Interdisciplinary Journal of Philosophy 16, 95-100.
Nelson, J.A., 1992. Gender, metaphor and the definition of economics. Journal of Economic Philosophy.
Nicholson, S.W., 2002. The Love of Nature and the End of the World. MIT Press, Cambridge.
Norton, B.G., Noonan, D., 2007. Ecology and valuation: Big changes needed. Ecol. Econ. 63, 664-675.
O'Neill, J.F., 1993. Ecology, Policy and Politics: Human Well-Being and the Natural World. Routledge, London.
Peterson, M.J., Hall, D.M., Feldpausch-Parker, A.M., Peterson, T.R., 2010. Obscuring Ecosystem Function with Application of the Ecosystem Services Concept. Conservation Biology 24, 113-119.
Plumwood, V., 1993. Feminism and the Mastery of Nature. Routledge, London.
Robinson, J.G., 2011. Ethical pluralism, pragmatism, and sustainability in conservation practice. Biological Conservation 144, 958-965.
Shiva, V., 1988. Staying Alive: Women, Ecology and Development. Zed Books, London.
Soma, K., 2006. Natura economica in environmental valuation. Environmental Values 15, 31-50.
Spash, C.L., 1995. The political economy of nature. Review of Political Economy 7, 279-293.

Spash, C.L., 1998. Investigating individual motives for environmental action: Lexicographic preferences, beliefs and attitudes, in: Lemons, J., Westra, L., Goodland, R. (Eds.), Ecological Sustainability and Integrity: Concepts and Approaches. Kluwer Academic Publishers, Dordrecht, The Netherlands, pp. 46-62.
Spash, C.L., 2000a. Ecosystems, contingent valuation and ethics: The case of wetlands re-creation. Ecol. Econ. 34, 195-215.
Spash, C.L., 2000b. Ethical motives and charitable contributions in contingent valuation: Empirical evidence from social psychology and economics. Environmental Values 9, 453-479.
Spash, C.L., 2000c. Multiple value expression in contingent valuation: Economics and ethics. Environmental Science & Technology 34, 1433-1438.
Spash, C.L., 2008a. Contingent valuation design and data treatment: If you can't shoot the messenger, change the message. Environment & Planning C: Government & Policy 26, 34-53.
Spash, C.L., 2008b. How much is that ecosystem in the window? The one with the bio-diverse trail. Environmental Values 17, 259-284.
Spash, C.L., 2009. The new environmental pragmatists, pluralism and sustainability. Environmental Values 18, 253-256.
Spash, C.L., 2011. Terrible Economics, Ecosystems and Banking. Environmental Values 20, 141-145.
Spash, C.L., Urama, K., Burton, R., Kenyon, W., Shannon, P., Hill, G., 2009. Motives behind willingness to pay for improving biodiversity in a water ecosystem: Economics, ethics and social psychology. Ecol. Econ. 68, 955-964.
Spash, C.L., Vatn, A., 2006. Transferring environmental value estimates: Issues and alternatives. Ecol. Econ. 60, 379-388.
TEEB, 2010. The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: A Synthesis of the Approach, Conclusions and Recommendations of TEEB. UNEP, Bonn.
ten Brink, B., 2006. Indicators as communication tools: an evolution towards composite indicators. A long-term biodiversity, ecosystem and awareness research network (ALTER-NET).
UNEP Convention on Biodiversity, 2010. Strategic Plan for Biodiversity 2011-2020 and the Aichi Targets. Secretariat of the Convention on Biodiversity, Montreal.
UNEP Finance Initiative, 2010. Demystifying Materiality: Hardwiring Biodiversity and Ecosystem Services into Finance, CEO Briefing. United Nations Environment Programme Finance Intiative, Geneve.
Vatn, A., 2005. Institutions and the Environment. Edward Elgar, Cheltenham.
Vatn, A., 2010. An institutional analysis of payments for ecosystem services. Ecol. Econ. 69, 1245-1252.
Vatn, A., Bromley, D.W., 1994. Choices without prices without apologies. Journal of Environmental Economics and Management 26, 129-148.
Waring, M., 1989. If Women Counted: A New Feminist Economics. Macmillan, London.
Warren, K., 1989. Feminism and ecology: Making connections. Environmental Ethics 9, 3-20.

**Table 1. Contrasting approaches to biodiversity policy**

| | **Environmental Economists** | **New Environmental Pragmatists** | **Traditional Ecologists** | **Social Ecological Economists** |
|---|---|---|---|---|
| **Process** | | | | |
| | Expert led | Expert led | Expert led | Expert/Lay |
| | Closed | Closed | Closed | Closed/Open |
| **Measure** | | | | |
| | Monetary | Monetary | Biophysical | Multiple criteria: Biophysical, Socio-economic |
| | Aggregated | Aggregated | Disaggregated | Disaggregated |
| | Primary & secondary data | Secondary data | Primary and secondary data | Primary and secondary data |
| **Method** | | | | |
| | Stated and revealed preferences, Benefit transfer | Value transfer | Biophysical index | Participatory, Deliberative |
| **Ethics** | | | | |
| | Preference utilitarian | Undefined hedonism, Consequentialism | Instrumental / intrinsic value mix | Value pluralism |
| **Policy Goal** | | | | |
| | Efficiency | Wealth creation | Biodiversity protection / conservation | Harmony with and respect for Nature, Sustainable systems |


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