The big picture

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Change, modification, revision, updating – these are terribly important features of humanity's abilities to cope with the world around us, to adapt to challenges and dangers, to progress and attain goals. At the heart of such action is the ability to fundamentally reassess our models of the world, to actually change the foundation of our beliefs and accept new visions of our universe. Science works, in part, because of this self-correcting behaviour, because of this willingness to hypothesize, test, reject, modify, and again hypothesize, rather than blindly cling to established dogma. Thus, we rejected a long-held view of an earth-centred universe, abandoned beliefs about an immutable creation of life, and relinquished stagnant continents for those that travel, all models of the world that were broadly accepted a short time before. This flexibility is no doubt an important feature of our success as a species, and probably has been strongly selected for.

We in the USA, as well as many people elsewhere, are in the midst of another transformation, this one having to do with our perception of humanity's relationship with and place in the natural world. Conservation biologists and natural resource managers are re-examining the ways that we have dealt with dwindling biodiversity and are developing new philosophies about and approaches to protection of the natural world and its functions. We have closely examined our models and efforts, and realized that a species-by-species approach will not, *by itself*, have the desired result of an intact and diverse world; there is too much diversity, functioning in too complicated and unknown ways, for us to reasonably handle it piece by piece. We have stepped back to look at the big picture, and have begun to embrace ecosystem management as an improvement in natural resource management and a more pragmatic model of our relationship with the natural world.

This shift from a single-species to an ecosystem focus is perhaps not as mind-boggling as discoveries in molecular genetics or particle physics, and is certainly without the same media coverage and public fascination. Ecosystem management may not have the dazzle of recombinant DNA research or the Hubbell Space Telescope, but is arguably vastly more important to the ultimate fate and welfare of humanity.

I have heard sceptics claim that ecosystem management is nothing new, and that in fact they have been doing ecosystem management for decades. A legitimate question then is whether ecosystem management is fundamentally different from the kinds of resource management we have been doing all along. I believe it is, in the following three, overarching ways. First, ecosystem management is a real expansion in three dimensions of typical natural resource management: a true ecosystem approach expands the spatial, temporal, and human dimensions. That is, an ecosystem approach demands a spatially broader coverage, a temporally longer consideration, and inclusion of a much more comprehensive population of decision makers and stakeholders than did traditional natural resource management. Ecosystem management should focus on large areas, such as parts of or entire watersheds, rather than small pieces of habitat. It should take into consideration timespans of decades to centuries rather than the next budgeting cycle. And, perhaps most importantly, it should include the visions, ideas, and knowledge of a broad diversity of individuals, but especially those living within the ecosystem and affected by the decisions. These are substantially different ways of approaching natural resource management than have been practised historically in many places.

Second, ecosystem management represents a change in world-view occurring in larger circles (e.g. Zukav, 1979; Capra, 1991) from a predictable Newtonian, mechanical model of nature to a more unpredictable, organic perspective of the natural world. We have started to realize over the last several decades that a 'balance of nature' model of the world is not accurate and that ecosystems are dynamic, somewhat unpredictable, and associated with a great deal of inherent variation and

uncertainty. An ecosystem approach not only clearly recognizes this variation and uncertainty, but embraces it as an integral part of the dynamic complexity of the world, and promotes it as something to be maintained by management. Any efforts to move beyond a simple, mechanistic model of nature should help us understand the realities, limitations, and capabilities of the natural world to support humanity over the long term.

Third, and a related point, good ecosystem management backs off from trying to control and minimize variation and surprise in natural systems and instead maintains the processes leading to such system behaviour (Holling and Meffe, 1996). Command-and-control of nature through technological prowess and brute force is replaced by an enlightenment that understands that co-operation with the forces of nature, rather than taming or controlling those forces, is in our ultimate best interests. Understanding the value of dynamism and change in nature, and learning to live within those 'rules' is one essence of good ecosystem management. It means learning humility as a species and admitting to natural limits.

I also hear sceptics claim that ecosystem management will not succeed because we cannot unambiguously define and delineate ecosystems, and we do not know enough about how they function. These, I feel, are simply excuses to not enter new and perhaps uncomfortable territories. Yes, we cannot effectively bound most ecosystems, and that is because nature is hierarchical and complex. But is it really necessary to delineate a geographical boundary to instil a different philosophy and approach? Ecosystem management is a process, not a place, and a simple focus on geography misses the point. And yes, we do not know much about how most ecosystems function, but we also do not know much about most populations, and that has not kept us from doing single-species management. What better way to build the knowledge base about ecosystems than to focus efforts at that level?

Virtually all federal agencies dealing in any way with natural resources in the USA are now undergoing reassessment and realignment to adopt an ecosystem approach. In response to Vice President Al Gore's National Performance Review, which called for 'a proactive approach to ensuring a sustainable economy and a sustainable environment through ecosystem management', an Interagency Ecosystem Management Task Force (1995) produced a major report on adopting this approach. A number of natural resource agencies came together last December in a major, 2-week workshop in Tucson, Arizona, led by the US Forest Service. This gathering of several hundred resource managers, scientists and other interested parties was designed to push forward and spread the development of ecosystem approaches much faster than the typical advance of a new scientific perspective. The product, a 2-volume book to be produced within the next year, is intended to serve as a guide to an ecosystem approach for the coming years, representing the collective wisdom of the nation's scientists and resource managers. The degree of success of the effort certainly is yet to be judged, but the mere fact of such an event occurring is reason to believe that adoption of ecosystem management in this country may become a reality. Whether true ecosystem management ensues – with its expanded spatial, temporal, and inclusiveness scales, as well as changes in agencies' interactions with each other and the public – remains to be seen. The proof will be in the actions taken.

In pursuing ecosystem management one must remember that it has a beginning but no end. One never finishes with ecosystem management, but continually strives to improve it; an ecosystem approach is an evolutionary, adaptive process, not a stagnant methodology. The worst thing that can happen to ecosystem management is to be doing the same things 10 years from now that we do today, to not have progressed from where we are now. Like any other model of the world, this one will be modified or even abandoned in favour of something more enlightened. This is an indication of a healthy model and a progressive world view. For the present, ecosystem management is where we are heading and we

should build upon it. We as a community of natural resource managers and conservationists must embrace the big picture, no matter how fuzzy and uncertain, before we lose it.

References

Capra, F. 1991. *The Tao of Physics.* Shambhala Publications, Boston, MA.

Holling, C.S. and Meffe, G.K. 1996. On command-and-control, and the pathology of natural resource management. *Conservation Biology,* 10 (2).

Interagency Ecosystem Management Task Force. 1995. *The Ecosystem Approach: Healthy Ecosystems and Sustainable Economies. Volume I: Overview.* National Technical Information Service, US Department of Commerce, Springfield, VA.

Zukav, G. 1979. *The Dancing Wu Li Masters. An Overview of the New Physics.* Bantam Books, New York.

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In the name of conservation

I am grateful to Sidney Holt for introducing me to readers of *Oryx*, even though his introduction was clearly not intended to flatter. According to his article on the Wise Use Movement, entitled 'The (Dis)information Age: a reply' (*Oryx*, **29,** 222–223), I am one of those Wise Use saboteurs who work to 'oppose conservation, but always in the name of conservation'. 'The name of the game,' Holt says, 'is systematic "disinformation" – a strategy developed in the bad old days by the KGB'. At first sight, I may appear to fit the part of a mole perfectly: I am a self-proclaimed conservationist, member of the Norwegian conservation association Norges Naturvernforbund yet I am an employee of the High North Alliance, an organization defending the killing of whales and seals.

On taking a closer look, it may become apparent that what Holt calls disinformation is, in fact, disagreement; and that Holt and I have divergent conceptions of what conservation really is. Therefore, I appreciate this opportunity of presenting my views on this important concept within environmentalism, a concept that, in my view, is all too often abused and misunderstood.

To me, and to the great majority of organized Norwegian conservationists, it is quite natural to defend the sustainable use of renewable resources in the name of conservation, irrespective of whether it applies to lichens, trees, blueberries, kangaroos, cod, moose, seals or whales. We feel certain that this in in harmony with internationally agreed principles based on, among other things, the Brundtland Commission, Agenda 21 and the strategy document, *Caring for the Earth* (IUCN *et al.*, 1991) Here, conservation is defined as, 'The management of human use of organisms or ecosystems to ensure that such use is sustainable.' Sustainable use is defined as: 'Use of an ecosystem or other renewable resource at a rate within its capacity for renewal.' The same document asserts that 'we have the right to the benefits of nature but these will not be available unless we care for the systems that provide them.'

Unfortunately, Holt does not initiate *Oryx* readers into his own definition of conservation, despite the fact that he accuses others of misusing the term. However, on the basis of an essay (Holt, 1992), it would appear that he confuses three different concepts – conservation, animal welfare and animal rights – and ends up with a vague and self-contradictory definition of conservation. He expresses enthusiasm at the prospect of animal rights being integrated into international law. Animal rights is a clearly defined concept with origins in philosophy. It is based on the idea that animals have 'inherent value' as 'the experiencing subject of a life' and that all who have inherent value, have it equally – whether they be 'human animals' or not (Regan and Singer, 1989). Against this backdrop, there can