

Integrating people and nature for landscape conservation

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ABSTRACT

There are two philosophies about relationships between humans and nature, anthropocentric and ecocentric. Societies holding an anthropocentric view consider humans and nature to be separate. In contrast, societies with an ecocentric philosophy view humans as an integral part of nature. Conservation is a major concern of modern societies. Loss of populations, sometimes of species, and degradation of other natural resources are large issues. Anthropocentric views which keep nature and humans apart and remove conservation from mainstream society are not going to provide the basis for conservation into the 21st century. We have to integrate people and nature, and involve people in conservation across landscapes within and outside parks and reserves. This will require working with local people, understanding cultural factors, sharing knowledge and power, and developing and applying stewardship arrangements including incentives for conservation on private and leasehold land.

Introduction

Beliefs about relationships between people and nature range from anthropocentric to ecocentric (or biocentric) (Taylor 1990, Clair *et al.* 1994 quoted in Craig 1997). The anthropocentric view is that the world consists of two opposites, humans and nature (Taylor 1990). This philosophy considers nature as something to be exploited by humans, or to be protected from them. Societies holding an anthropocentric philosophy place small parts of nature in reserves largely separated from human contact (Craig 1997). Outside reserves, anthropocentric societies regard nature as largely irrelevant, or a resource to be exploited. Modern Western societies, including Australia, usually hold primarily anthropocentric beliefs about relationships between people and nature.

The ecocentric or biocentric belief is that humans are part of nature (Taylor 1990), where the quality of human life is tied to the effective functioning of all ecosystems (Craig 1997). Societies with an ecocentric philosophy consider that sustainable use and conservation of nature are interdependent, and are compatible when the right management systems are in place. In the modern world such societies seek to charge

environmental costs to the users (e.g., polluter pays), with the funds raised used to rehabilitate ecosystems and restore their natural functions. Environmental benefits (e.g., retention of native vegetation) are also charged to those who benefit, both directly and indirectly from them.

Many indigenous people have an ecocentric view about nature and people. They consider their culture to be inextricably linked to nature, especially to wildlife (Dwyer 1994, Caughley *et al.* 1996, Vardon *et al.* 1996). The anthropocentric concept of separate cultural and natural landscapes held by most European settlers led to inaccurate and naive assumptions about many indigenous people. Indigenous people who did not cultivate the soil to grow crops were particularly misunderstood. Such people were assumed to be part of nature, rather than living in a world where nature and culture merged (Taylor 1990, Dwyer 1994, Rose 1996 quoted in Sharp 1998). Europeans did not realise that humans in such societies were managing natural landscapes and wildlife through strong cultural conventions (Clarke pers. comm. quoted in Sharp 1998, Collins *et al.* 1996, Rose 1984 quoted in Collins *et al.* 1996), with culture and environment inseparably interwoven.

When did nature and culture part company in many human societies? The German school of landscape ecology in the late 1800s was the first discipline to make an explicit distinction between natural landscapes and landscapes modified by humans (Taylor 1990). But, the separation of people from nature precedes this date considerably. The anthropocentric view about nature appears to go back to Judaeo-Christian beliefs that plants and animals were put on Earth for human benefit (Burbidge and Wallace 1995), and that it was the duty of responsible humans to tame the wilderness, usually by cultivating the soil (see Nash 1967 for an account of the origins of the wilderness concept). This belief in the moral rightness of taming the wilderness - literally “wild-deer-ness” or place of wild beasts (Nash 1967) - was a very strong trait in pioneer (and later) Australians from Europe.

As a result of these historical factors, modern Western societies tend to see nature and culture as separate, and often in conflict. This view is reinforced by the difficulty of including effects on ecosystem services of using natural resources in the value of commodities (Young 1992, Daily 1997). The anthropocentric view of nature and culture leads to conservation being isolated from mainstream society, including from economic and other considerations of society. Conservation becomes a recipient of government welfare or “dregs” (Craig 1997, Shea *et al.* 1997). Conservation on government welfare alone is not sustainable. If people and nature remain apart, conservation will become an activity that is marginal to society, and therefore marginal to society’s resources, both public and private. The conservation needs of the world in which we live are too great to allow this to happen.

The conservation imperative

It is stating the obvious that conservation is of major concern, nationally and internationally. Loss of populations, sometimes of species, and degradation of land and water are large issues facing Australia (Saunders *et al.* 1990, State of the Environment Advisory Council 1996). The reasons for these problems are complex. They include misguided economic signals, especially tax laws (see Binning and Young 1999), regulations of agencies in previous decades (Shea *et al.* 1997), a yearning for “a green and pleasant land” with familiar animals, a lack of understanding of the vagaries of the Australian environment, and a belief that it was the moral duty of “civilized”

humans to “improve” the land (i.e., to control, clear, develop and cultivate it).

Natural and semi-natural environments were not entirely ignored during the first two centuries of European settlement in Australia. But, as the following examples demonstrate, nature and people were usually seen as separate. Nature was either a place for entertainment without interacting very much with the natural environment, a force to be feared (as sand storms engulfed many arid and semi-arid areas of Australia), or as something to be removed from direct human action. There were a few historical exceptions to this anthropocentric view, but the anthropocentric view of nature largely prevailed during the first 200 years of European settlement in Australia.

Some examples of historical awareness of the natural Australian environment from an anthropocentric view are as follows. The first National Park in Australia, Royal National Park was dedicated in 1879 primarily as a place for entertainment. Deer were introduced into Royal National Park in 1907, perhaps to give it the feel of a wild place. There was considerable concern in the late nineteenth century and in the early part of the twentieth century about land degradation as it resulted in sand storms in what we now call the rangelands (Ratcliffe 1947, Lunney 1994). The concept of a sanctuary, sometimes on private land, where direct human action in the form of hunting native wildlife was not allowed but habitat management was rarely considered, also existed earlier this century. However, it was not until the 1970s that most people in Australia started to think seriously about conservation, and about the way we should be managing our landscapes.

The first, and still the main response, to concerns about conservation was to increase the number and area of parks and reserves. This had the effect of reinforcing the anthropocentric view that humans and nature are separate. Nature existed in parks and reserves, and human use occurred elsewhere. Certain uses by people of parks and reserves were allowed, but such areas were considered to be mainly for nature. The exception to this was where a park was dedicated for its spectacular scenery, or for its natural phenomena for people to enjoy in a passive way.

The prevailing view was that conservation happened in publicly owned parks and reserves. Lands outside these tenures (i.e., freehold, leasehold or other Crown land outside national

parks and nature reserves) were considered largely irrelevant to conservation. If lands on these other tenures appeared to have conservation value (usually judged on scenic quality), strong efforts were made to incorporate them into the public reserve system. Worldwide, such incorporation often occurred without consultation with local people, including those directly affected by the park (Eidsvik 1998, Fortin and Gagnon 1999). Local agency staff whose job it would be to manage the new park were often not consulted. This situation has changed somewhat, and consultation about new parks and reserves with local communities is now undertaken. More attention needs to be given to including local people into decision making about parks and reserves in their region (Fortin and Gagnon 1999), including forming active partnerships between agencies and local landholders.

Nature and culture (or conservation and people) in Australia are still largely viewed as remote from each other, with nature conservation the domain of the public sector and human land use the domain of the private sector. This anthropocentric view is widespread but not universal (for some recent, alternative views see Binning 1997, Binning and Young 1997, Gilligan 1998, Eidsvik 1998, Phillips 1998, Sturgess 1998, Visions Steering Committee 1998). The anthropocentric view about nature and humans is not going to provide the basis for conservation in the 21st century. Keeping people and conservation apart, and seeing conservation as the sole responsibility of government agencies, are not recipes for long term conservation. We have to integrate people and conservation, both in and outside parks and reserves.

A major reason for including people in the management of parks and reserves is the considerable pressure that retiring “baby boomers” will place on parks in coastal Australia as we retire to coastal areas over the next 20 years. The human pressure on coastal regions is already high, and increasing with time as people move to these areas (see Adam 1995, Lunney and Matthews 1997, Australian Bureau of Statistics 1998). A substantial proportion of the national parks in New South Wales is in coastal areas. We have to find ways to integrate people into the conservation and management of these parks, by encouraging local participation in decision making processes and a sense of ownership of the park or reserve by local people. We need to find

ways for people to benefit from parks, and to allow people to provide benefits to parks and reserves. If we do not do this, there will be insufficient resources to manage our parks and they will slowly decay from increasing use.

Outside parks and reserves, conservation needs to be encouraged as a legitimate form of land use. The principal reason for this is financial, although the scattered nature of some types of ecosystems (e.g., wetlands, woodland remnants) provides a sound ecological basis for the approach (see Binning 1997). The economic factors are as follows. New South Wales is used as the example. From figures in Anonymous (1998) it will take between 40 and 130 years to purchase a reserve system which meets a minimum standard of representing 10% of ecosystems in New South Wales, assuming there is no major increase in funds available to purchase land for parks and reserves in the future. Further information on the costs of acquiring a representative public reserve system in NSW is in Young and Howard (1996).

Similar economic constraints to acquiring land for publicly owned parks and reserves apply throughout Australia. Such high costs and long time frames for public reservation leave little choice but to seriously consider mechanisms for achieving conservation on private and leasehold land, as part of mainstream conservation and economic activity. Hobbs and Saunders (1993), Platt and Ahern (1996), Farrier (1996) and Beeton (1997) give further cogent reasons for including private land in conservation strategies.

The way forward - integrating people with conservation

Our future depends on us adopting an ecocentric view of humans and nature. Developing and applying mechanisms to involve people in conservation, both in publicly owned parks and reserves and on lands outside these areas, is a priority. Integrating people and conservation needs to be practical, as well as philosophical. Here, I give some pathways for achieving conservation by integrating people with nature within and outside parks. The pathways are largely philosophical and social, and involve communication, motivation and the development of trust between different groups. Practical means of encouraging conservation outside public lands such as incentives, are also important.

Parks and reserves are best planned and managed with local people (Phillips 1998, Bennett 1999, Fortin and Gagnon 1999). They are part of a landscape (including the people in the landscape), and need to be managed with people as part of the landscape (see Hobbs and Saunders 1993, Beeton 1997, Bennett 1999). Parks and reserves are not islands (Figure 1).

Craig (1997) discusses ways of incorporating people into management in parks and reserves. His arguments are persuasive. If we do not include people in reserve management then the resource will decline, and people will be alienated from conservation. Craig (1997) argues that we need to allow people to pay to view and sustainably use ecosystems in parks and reserves, especially their wildlife. For example, many people are interested in management of endangered species, and are willing to contribute considerable sums of money to be involved in such programs. The funds raised can then be used directly for conservation management, preferably in the park or reserve where they were raised.

Outside parks and reserves we have to build institutional frameworks to encourage and support conservation by landholders, sometimes in

partnership with government agencies. These frameworks are largely missing at present, as is a culture which promotes nature conservation as a mainstream land management issue rather than the exclusive domain of one or two public agencies.

Bringing people and nature together in working relationships to achieve conservation on and off parks (along with other relevant land uses), will not be easy. It requires a thorough understanding of a variety of social factors, a willingness by agencies, and other groups and organisations to share power and knowledge, an unwillingness to be adversarial or to grandstand, a focus on the best ways to achieve conservation goals rather than being overly reliant on regulations, a desire to resolve issues rather than score points from perceived opponents (see Figure 2), development of trust between different groups, development of institutional and legal frameworks to integrate people and conservation, and economic and other incentives. Incentives are particularly necessary for conservation on freehold or leasehold land.

Most of the concepts and strategies that follow for integrating people and conservation apply to parks and reserves, as well as to off-park conservation.

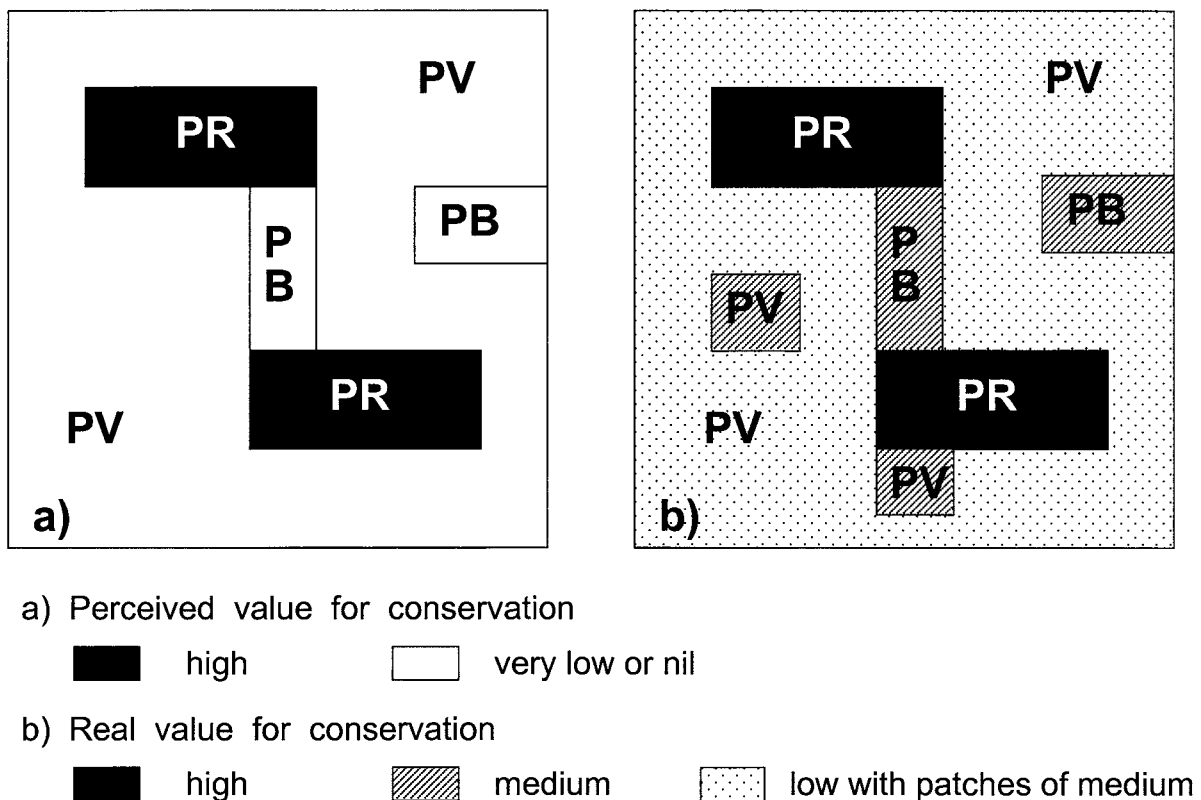


Figure 1. Common perception of parks and reserves (a). The reality is more like (b). PR, park or reserve; PB, other public land; PV, private land.

Some, particularly incentives, are more relevant to off-park conservation, but most are ways to integrate people into conservation generally. Some of the social factors involved in achieving conservation on private and leasehold land are discussed in Saunders *et al.* (1996), and also in Briggs (1998). The same factors apply to involving people in conservation within parks and reserves.

In order to bring people and conservation together, agency staff, landholders, other natural resource managers, park users, people interested in conservation generally, indigenous people, and scientists need to communicate as individuals, rather than as members of their group (Kersten 1995) (see Figure 2). Mutual respect and understanding of other people's knowledge, social conventions, philosophies and financial situations are essential. Agency staff need to be aware of, and avoid creating, outrage among landholders and other community groups. Outrage occurs when people become hostile because they were not consulted prior to an action, e.g., by government, rather than being hostile to the intent of the action itself (NSW Minerals Council undated).

Neither agency staff, landholders, other resource users, conservation groups, scientists, nor people who visit and use parks have a monopoly on knowledge or experience in natural resource

conservation and management. Sharing knowledge among these groups is essential for conservation, on and off parks. Language is important, especially jargon and terms such as threatening processes (Young 1997) which can alienate people, especially landholders, from nature and conservation. Such terms are best avoided until trust has been established. They should then be used only in their strict legal sense. People, including agency staff, who work at sharing knowledge and information about conservation management with others should be encouraged. Retaining knowledge, which is usually done to retain power, needs to be strongly discouraged in agencies and other institutions through social condemnation.

Sharing power among all stakeholders is essential for integrating people and conservation in and outside parks. Sharing power requires genuine consultation and exchange of knowledge. It brings people and nature together, and breaks down the incorrect belief that conservation is the sole responsibility of public agencies and their staff. Power sharing increases the resilience of institutions and reduces the risk of making incorrect decisions. Lack of power sharing between agencies, and between agencies and the community leads to alienation, inflexibility, lack of resilience, myopia and rigidity in institutions.

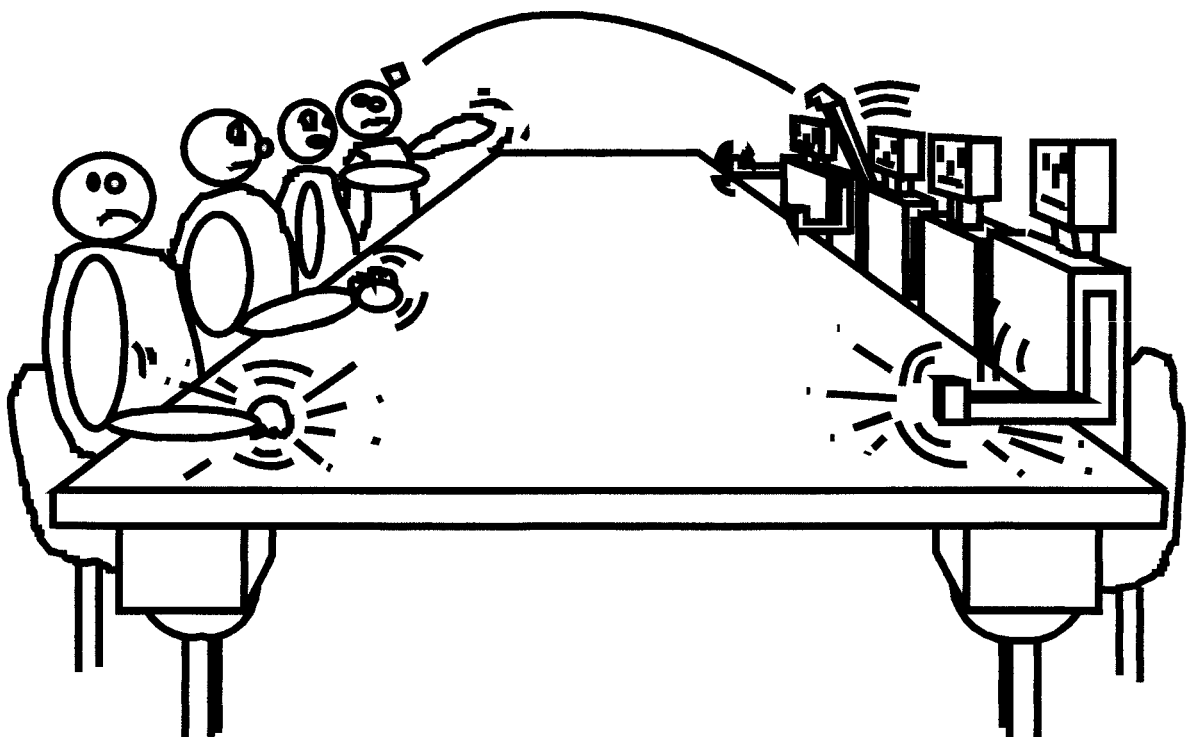


Figure 2. Common, adversarial model for meetings. Meetings structured this way are usually designed to score points from the other party rather than to achieve long term conservation goals.

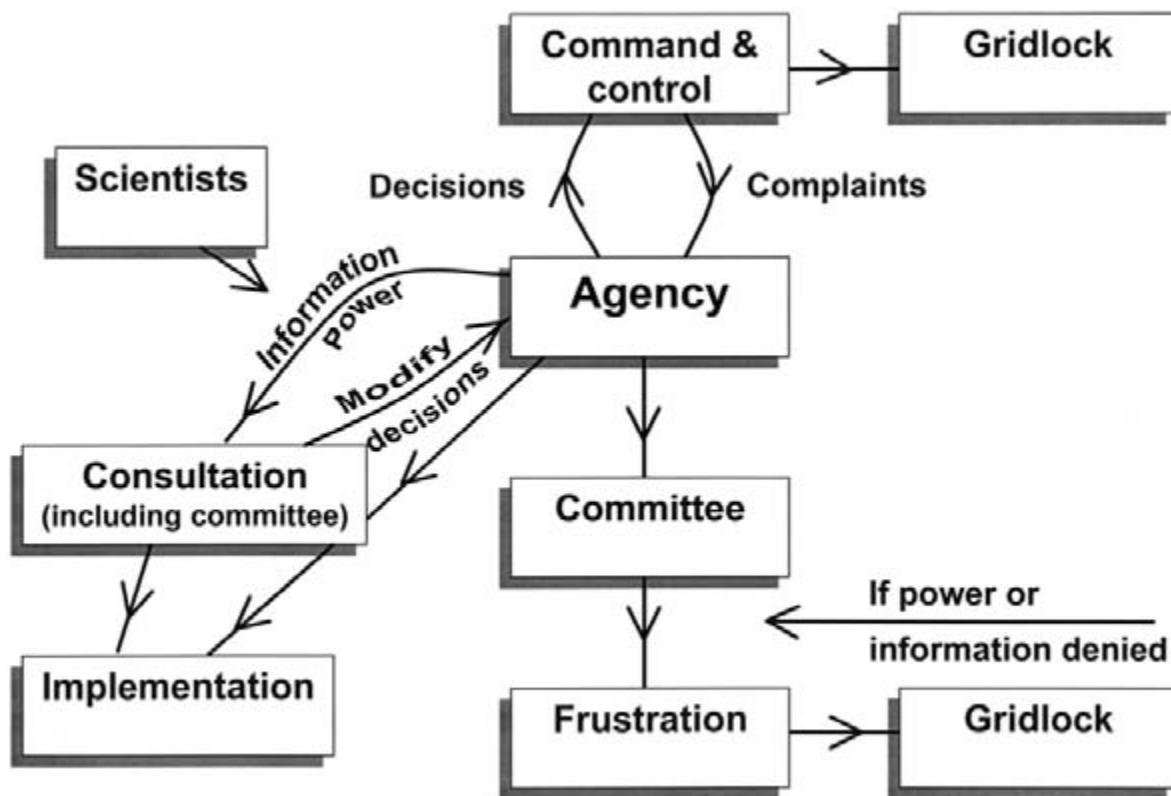


Figure 3. Processes that lead to gridlock in decision making by agencies. Gridlock results when agencies do not share power and knowledge with community groups and other agencies.

These lead to gridlock in decision making (see Figure 3) (Holling and Meffe 1995), and may ultimately lead to the irrelevance of the agency. As with knowledge, institutions and communities need to reward natural resource managers and scientists who share power, and discourage those who do not.

Conservation outside parks and reserves, and involving people in conservation within parks, cannot be achieved without communication and trust between the various stakeholders, in and between agencies and other institutions, and with community groups (see Moore 1996). Trust in the person delivering the message is a more important part of most communication than the form of the message (Moore 1996, Grumbine 1997, Rayns 1997, Siepen and Stone 1997, Weeks and Packard 1997). Trust is destroyed by lack of consultation, talking down to people, and by false consultation (pretending to consult while ignoring the information or advice received) (Shulman and Martinek 1998). Trust is enhanced by people learning and understanding each others' social conventions, and management needs and constraints (Briggs 1998).

Structural and institutional factors are generally more limiting to conservation than is ecological knowledge (Stafford Smith *et al.* 1997). This is

particularly so with off-park conservation. Governments need to build administrative structures to bring people and nature together, especially to empower landholders and other non-government groups to conserve biodiversity (Young *et al.* 1996). Educating people, including politicians, about nature and about linkages between people and nature is important (Wills and Hobbs 1998). The belief that conservation is a public responsibility with little or no role for private individuals is a major impediment to achieving conservation on private and leasehold lands (Binning 1997). The strong emphasis on public acquisition and public management of lands for conservation have disenfranchised many landholders and other people from taking an active role in conservation (Binning 1997), and reinforced the separation of people from nature.

Conservation outside parks and nature reserves usually requires the use of incentives. These can be voluntary (economic and motivational) or regulatory. A mix of incentives is generally more effective than just one (Young and Gunningham 1996, Young *et al.* 1996). On their own, regulations to control people's actions are generally unsuccessful as a means of conservation because they are blunt instruments. They are expensive and usually difficult to enforce, they alienate people from

nature, and they can adversely affect people and conservation if people do not know why they are being enforced (Benson 1997). Regulations need to underpin other incentives, not be the instrument of first choice. Tax incentives are a particularly useful form of incentive, especially for private conservation reserves.

To be effective, conservation on private land needs to be supported philosophically by agencies. Management agreements for private conservation reserves, and other processes for achieving conservation initiatives on freehold and leasehold land, should be as efficient as possible. Paperwork should be kept to a minimum. This is especially so where relatively small amounts of assistance are given to the landholder for conservation management. Management agreements must be equally binding on governments and landholders (Binning and Young 1997).

Stewardship arrangements can be an effective form of conservation, particularly on private and leasehold land. Stewardship arrangements involve paying a landholder to actively manage land for conservation (Farrier 1995, Morton *et al.* 1995, Binning and Young 1997). Such land would usually be his/her land, but could also include parts of nearby properties, and public lands in remote areas. Stewardship arrangements are particularly likely to be effective conservation measures where remnant woodland patches or wetlands are scattered across several properties (Binning 1997). Philosophies and practical frameworks to implement this type of management are in their infancy in Australia.

Stewardship arrangements for conservation management on private land should define clearly

when such an approach is desirable (see Binning and Young 1997), and set priorities. Accreditation schemes need to be developed for people contracted under such arrangements. Stewardship payments should not include compensation for landholders required to forgo an activity (other compensation may be appropriate here in certain circumstances). Farmers (or others) who are paid to manage freehold or leasehold land, or public reserves for conservation will need to operate under contract, and be accredited prior to being contracted.

Integrating people and conservation within and outside public parks and reserves is not going to be easy. It will require brave and innovative people making brave and innovative decisions. It will require us to develop a vision of how to integrate conservation with people, and conversely, how to integrate people and our activities with conservation (see Saunders 1996, Visions Steering Committee 1998). Open discussion of the advantages and disadvantages for conservation of sustainably using wildlife and other natural resources (see Grigg and Lunney 1995, Jenkins 1995) will need to be encouraged. Reuniting people with nature will challenge many people both within and outside agencies. The task is great, but the penalties of not integrating people and conservation are also great - serious declines, not just in biodiversity but in ecological processes. We have to develop pathways to ensure that such declines do not happen. As pointed out by Phillip Adams (quoted in Lefroy *et al.* 1993) "The future is not some place we are going to but one we are creating. The paths to it are made, not found...".

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References

Adam, P. 1995. Urbanization and transport. Pp. 55-75 in *Conserving biodiversity: threats and solutions* ed by R.A. Bradstock, T.D. Auld, D.A. Keith, R.T. Kingsford, D. Lunney and D.P. Sivertsen. Surrey Beatty: Chipping Norton, NSW.

Anonymous 1998. Filling the gaps in protected areas. Pp. 34-48 in *National Parks: visions for the new millennium symposium workshop papers*. NPWS: Hurstville, NSW.

Australian Bureau of Statistics. 1998. *Projections of the populations of Australia, States and Territories*. ABS: Canberra.

- Beeton, R.J.S. 1997.** Is anyone out there ? Do the rangelands have a future ? Pp. 1-10 in *Where the city meets the bush: the importance of effective communication* ed by E.J. Moll, J. Coutts, M.J. Page and C.F. Kilpatrick. University of Queensland: Gatton.
- Bennett, A.F. 1999.** *Linkages in the landscape*. IUCN: Cambridge.
- Benson, J.S. 1997.** Conservation of native lowland grassland remnants in south-eastern Australia. Pp. 424-8 in *Conservation outside nature reserves* ed by P. Hale and D. Lamb. University of Queensland: Brisbane.
- Binning, C.E. 1997.** Beyond reserves; options for achieving nature conservation objectives in rural landscapes. Pp. 155-68 in *Frontiers in ecology* ed by N. Klomp and I. Lunt. Elsevier: Oxford.
- Binning, C. and Young, M. 1997.** *Motivating people - using management agreements to conserve remnant vegetation*. Paper 1/97. National R & D Program on Rehabilitation, Management and Conservation of Remnant Vegetation. LWRRDC and Bushcare: Canberra.
- Binning, C. and Young, M. 1999.** *Conservation hindered*. Research Report 3/99. National R & D Program on Rehabilitation, Management and Conservation of Remnant Vegetation. LWRRDC and Bushcare: Canberra.
- Briggs, S. 1998.** Communication and motivation - essential ingredients in working with landholders for wetland conservation. *Natural Resource Management* 1(2): 9-12.
- Burbidge, A.A. and Wallace, K.J. 1995.** Practical methods for conserving biodiversity. Pp. 11-26 in *Conserving biodiversity: threats and solutions* ed by R.A. Bradstock, T.D. Auld, D.A. Keith, R.T. Kingsford, D. Lunney and D.P. Sivertsen. Surrey Beatty: Chipping Norton, NSW.
- Caughley, J., Bomford, M. and McNee, A. 1996.** Use of wildlife by indigenous Australians: issues and concepts. Pp. 7-9 in *Sustainable use of wildlife by Aboriginal peoples and Torres Strait Islanders* ed by M. Bomford and J. Caughley. Australian Government Publishing Service: Canberra.
- Clair, J.A., Millman, J. and Whelan-Karhan, K.S. 1994.** Towards an environmentally sensitive ecophilosophy for business management. *Industry and Environment Crisis Quarterly* 9: 289-326.
- Collins, J., Klomp, N. and Birckhead, J. 1996.** Aboriginal use of wildlife: past, present and future. Pp. 14-26 in *Sustainable use of wildlife by Aboriginal peoples and Torres Strait Islanders* ed by M. Bomford and J. Caughley. Australian Government Publishing Service: Canberra.
- Craig, J.L. 1997.** Managing bird populations: for whom and at what cost. *Pacific Conservation Biology* 3: 172-82.
- Daily, G.C. 1997.** Introduction: What are ecosystem services? Pp. 1-10 in *Nature's services* ed by G.C. Daily. Island Press: Washington, DC.
- Dwyer, P.D. 1994.** Modern conservation and indigenous peoples: in search of wisdom. *Pacific Conservation Biology* 1: 91-7.
- Eidsvik, H. 1998.** Keynote address - visions for the new millenium. In *National Parks: visions for the new millenium symposium*. NPWS: Hurstville, NSW.
- Farrier, D. 1995.** Policy instruments for conserving biodiversity on private land. Pp. 337-59 in *Conservation biodiversity: threats and solutions* ed by R.A. Bradstock, T.D. Auld, D.A. Keith, R.T. Kingsford, D. Lunney and D.P. Sivertsen. Surrey Beatty: Chipping Norton, NSW.
- Farrier, D. 1996.** Implementing the in-situ conservation provisions of the United Nations Convention on Biological Diversity in Australia : questioning the role of national parks. *Australian Journal of Natural Resources Law and Policy* 3: 1-24.
- Fortin, M.-J. and Gagnon, C. 1999.** An assessment of social impacts of national parks on communities in Quebec, Canada. *Environmental Conservation* 26: 200-211.
- Gilligan, B. 1998.** The NPWS in the new millenium. In *National Parks: visions for the new millenium symposium*. NPWS: Hurstville, NSW.
- Grigg, G. and Lunney, D. 1995.** Potential conservation benefits from kangaroo harvesting. Pp. 339-40 in *Conservation through sustainable use of wildlife* ed by G.C. Grigg, P.T. Hale and D. Lunney. University of Queensland: Brisbane.
- Grumbine, R.E. 1997.** Reflections on "what is ecosystem management?". *Conservation Biology* 11: 41-7.
- Hobbs, R.J. and Saunders, D.A. (eds) 1993.** *Reintegrating fragmented landscapes*. Springer-Verlag: New York.
- Holling, C.S. and Meffe, G.K. 1995.** Command and control and the pathology of natural resource management. *Conservation Biology* 10: 328-37.
- Jenkins, H. 1995.** Conservation benefits from sustainable use. Pp. 337-38 in *Conservation through sustainable use of wildlife* ed by G.C. Grigg, P.T. Hale and D. Lunney. University of Queensland Press: Brisbane.
- Kersten, S. 1995.** In search of dialogue. *Western Division Newsletter*, September. NSW Agriculture: Dubbo, NSW.
- Lefroy, E.C., Hobbs, R.J. and Scheltema, M. 1993.** Reconciling agriculture and nature conservation: towards a restoration strategy for the Western Australian wheatbelt. Pp. 243-57 in *Nature conservation 3: reconstruction of fragmented ecosystems* ed by D.A. Saunders, R.J. Hobbs and P.R. Ehrlich. Surrey Beatty: Chipping Norton, NSW.

- Lunney, D. 1994.** Royal Commission of 1901 on the Western Lands of NSW - an ecologist's summary. Pp. 221-40 in *Future of the fauna of western New South Wales* ed by D. Lunney, S. Hand, P. Reed and D. Butcher. Royal Zoological Society of NSW: Mosman, NSW.
- Lunney, D. and Matthews, A. 1997.** The changing roles of state and local government in fauna conservation outside nature reserves: a case study of koalas in New South Wales. Pp. 97-106 in *Conservation outside nature reserves* ed by P. Hale and D. Lamb. University of Queensland: Brisbane.
- Moore, S. 1996.** The role of trust in social networks: formation, function and fragility. Pp. 148-54 in *Nature conservation 4: the role of networks* ed by D.A. Saunders, J.L. Craig and E.M. Mattiske. Surrey Beatty: Chipping Norton, NSW.
- Morton, S.R., Stafford Smith, D.M., Friedel, M.H., Griffin, G.F. and Pickup, G. 1995.** The stewardship of arid Australia: ecology and landscape management. *Journal of Environmental Management* **43**: 195-217.
- Nash, R. 1967.** *Wilderness and the American mind*. Yale University Press: New Haven.
- NSW Minerals Council. Undated.** *Guidelines for best practice community consultation*. NSW Minerals Council: Sydney.
- Phillips, A. 1998.** Protected areas: taking stock at the end of the century. In *National Parks: visions for the new millennium symposium*. NPWS: Hurstville, NSW.
- Platt, S.J. and Ahern, L.D. 1996.** Nature conservation on private land in Victoria - the role of Land for Wildlife. Pp. 300-11 in *Nature conservation 4: the role of networks* ed by D.A. Saunders, J.L. Craig and E.M. Mattiske. Surrey Beatty: Chipping Norton, NSW.
- Ratcliffe, F. 1947.** *Flying fox and drifting sand*. Angus and Robertson: Sydney.
- Rayns, N. 1997.** Partnerships in Australian Commonwealth fisheries management. Pp. 17-28 in *Frontiers in ecology* ed by N. Klomp and I. Lunt. Elsevier Science: Oxford.
- Rose, D.B. 1984.** Consciousness and responsibility in an Australian Aboriginal religion. *Nelen Yubu* **23**.
- Rose, D.B. 1996.** *Nourishing terrain*. Heritage Commission: Canberra.
- Saunders, D.A. 1996.** Does our lack of vision threaten the viability of the reconstruction of disturbed ecosystems? *Pacific Conservation Biology* **2**: 321-26.
- Saunders, D.A., Hopkins, A.J.M. and How, R.A. (eds) 1990.** *Australian ecosystems: 200 years of utilization, degradation and reconstruction*. Surrey Beatty: Chipping Norton, NSW.
- Saunders, D.A., Craig, J.L. and Mattiske, E.M. eds 1996.** *Nature conservation 4: the role of networks*. Surrey Beatty: Chipping Norton, NSW.
- Sharp, N. 1998.** Handing on the right to fish: the law of the land and cross-cultural co-operation in a gulf community in Australia. *Pacific Conservation Biology* **4**: 95-104.
- Shea, S.R., Abbott, I., Armstrong, J.A. and McNamara, K.J. 1997.** Sustainable conservation: a new approach to nature conservation in Australia. Pp. 39-48 in *Conservation outside nature reserves* ed by P. Hale and D. Lamb. University of Queensland: Brisbane.
- Shulman, A.D. and Martinek, P. 1998.** Managing institutional collaboration in catchment systems research. Pp. 65-70 in *Farming action: catchment reaction* ed by J. Williams, R.A. Hook and H.L. Gascoigne. CSIRO: Melbourne.
- Siepen, G. and Stone, G.C. 1997.** Identification of rural landholders' requirements for nature conservation information. Pp. 226-32 in *Conservation outside nature reserves* ed by P. Hale and D. Lamb, University of Queensland: Brisbane.
- Stafford Smith, M., Morton, S. and Ash, A. 1997.** On the future of pastoralism in Australia's rangelands. Pp. 7-16 in *Frontiers in ecology* ed by N. Klomp and I. Lunt. Elsevier: Oxford.
- State of the Environment Advisory Council. 1996.** *Australia state of the environment report 1996*. CSIRO: Collingwood, Vic.
- Sturgess, G. 1998.** Conservation and institutional diversity. In *National Parks: visions for the new millennium symposium*. NPWS: Hurstville, NSW.
- Taylor, S.G. 1990.** Naturalness: the concept and its application to Australian ecosystems. Pp. 411-8 in *Australian ecosystems: 200 years of utilization, degradation and reconstruction* ed by D.A. Saunders, A.J.M. Hopkins and R.A. How. Surrey Beatty: Chipping Norton, NSW.
- Vardon, M., Missi, C. and Cleary, M. 1996.** Commercial wildlife use: potential benefits and opportunities for indigenous Australians. Pp. 84-7 in *Ecopolitics IX: perspectives on indigenous peoples management of environmental resources* ed by R. Sultan, P. Josif, C. Mackinolty and J. Mackinolty. Northern Land Council: Darwin.
- Visions Steering Committee. 1998.** *Report of the Steering Committee to the Minister for the Environment*. NPWS: Hurstville, NSW.
- Weeks, P. and Packard, J.M. 1997.** Acceptance of scientific management by natural resource dependent communities. *Conservation Biology* **11**: 236-45.
- Wills, R.T. and Hobbs, R.J. eds 1998.** *Ecology for everyone: communicating ecology to scientists, the public and the politicians*. Surrey Beatty: Chipping Norton, NSW.
- Young, M.D. 1992.** *Sustainable investment and resource use*. UNESCO: Paris.

Young, M. 1997. *Mining or minding: opportunities for Australia to improve conservation of remnant vegetation and to alleviate land degradation*. CSIRO Wildlife and Ecology: Canberra.

Young, M. and Howard, B. 1996. Can Australia afford a representative reserve network by 2000? *Search* 27: 22-6.

Young, M.D. and Gunningham, N. 1996. Mixing instruments and institutional arrangements for optimal

biodiversity conservation. Pp. 141-165 in *Investing in biological diversity, Proceedings of the OECD International Conference on Incentive Measures for the Conservation and Sustainable Use of Biological Diversity*. OECD: Cairns.

Young, M.D., Gunningham, N., Elix, J., Lambert, J., Howard, B., Grabowsky, P. and McCrone, E. 1996. *Reimbursing the future*. DEST Biodiversity Series, Paper No. 9. DEST: Canberra.

QUESTIONS & ANSWERS

DICKMAN: Thanks, Sue. Any questions?

HEMERY: I'd like to touch on your comment about the secrecy process and knowledge as power. One thing that has occurred to me in my work with scientists and community groups over the last three years is that sometimes it's difficult for scientists to share their knowledge with each other. I shall just give one particular case in a wetland system where I live and where there were three different universities studying the same wetland system, two different departments with one university studying the same wetland system, and none of them would talk to each other.

BRIGGS: The reward structure, I'd suggest, encourages them to do - whoever gets the paper out first gets the brownie points. I don't know whether ARC grants allow this, but perhaps they should give a higher weighting to papers published by people between two or three universities. That's just off the top of my head but that's the kind of change in the system that we need.

DENIS SAUNDERS: There's an ideal opportunity to pull them all together in a seminar in your area and say, "Look, tell us what you know and share that knowledge," and you set it up yourself. That may be a good catalyst.

MARTIN DENNY: Sue, what's the ideal size for a committee? One of the things I note here is that you have very broad-reaching aims in bringing a lot of people together. It seems to me that you're going to end up having something that's a committee that actually would need to be housed in an auditorium.

BRIGGS: That's a valid point, Martin. This is what I meant about anomalies. It probably needs flesh on the bone. The whole partnership thing is talk too, isn't it? We don't know how to do it yet. You don't want more than 8 or 10 people, do you? But maybe we want more than that, and then we want people going off into subgroups. I think you're right. It's easy for me to wave my arms. How do we make it happen? That's more important.