

## Urban bioregional planning for working landscapes — Biosphere Reserves revisited

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### ABSTRACT

Australia became a signatory to the UNESCO/MAB Biosphere Reserve Program in 1977 and twelve Biosphere Reserve sites were nominated over the following five years. Very little development of the Program followed. Limited success can be attributed to a number of factors including preoccupation by relevant government authorities with protection through the National Park and World Heritage Area designations.

The objective of this paper is to compare existing (old) Australian Biosphere Reserves with the urban and peri-urban (new) Biosphere Reserves. An examination of the theoretical framework of which Biosphere Reserves are a part provides a context for further discussion. The old and new approaches to Biosphere Reserves in Australia are discussed and the principle factor in their success is highlighted. Application of the Biosphere Reserve concept in an urban and peri-urban bioregion is illustrated through a case study of the Mornington Peninsula – Western Port Urban Biosphere Reserve.

This paper argues that two very different approaches are adopted for Biosphere Reserves in Australia. Old designations have floundered in the absence of government support due to little understanding or concern for the concept, or perception of duplicate titles in the case of National Parks or World Heritage status. In contrast, the urban and peri-urban Biosphere Reserve is a community driven initiative, derived at a bioregional level for the long-term fulfilment of mutual directives regarding environmental and social community goals.

The Biosphere Reserve Program provides a framework for achievement of catchment management objectives and incremental conservation practices in working landscapes. The success of new Biosphere Reserves depends strongly upon community drivers and regional visions, Commonwealth dissemination of the Biosphere Reserve Program, and State and Local Government support and prioritisation for integrative local conservation.

### INTRODUCTION

Australia is one of the most urbanised countries in the world, with more than 85% of the population residing in major towns or cities. Perhaps as a result of this urbanisation, the connectivity and interdependencies between natural, rural and urban areas is gaining greater appreciation and attention. Concepts such as the 'ecological footprint' have highlighted the massive societal dependence on ecosystem support. The ecological footprint of an Australian is around 6 ha per capita, well above the global average of 1.8 ha per capita (Barnett 2001). The impacts of Australia's urban environments have extended well beyond city limits.

The lack of a delimiter between city and bioregion is indicative of the landscape scale as the main scale of human interaction with the environment. A landscape-regional context links multiple spatial and temporal scales of biodiversity with human uses and socio-economic imperatives (Brunkhorst 2001). Human systems for environmental management however do not abide by these spatial scales, tending to focus on the productive unit scale that is often politically determined, for example, forestry coupes or local council Shires. However, sustainability is most usefully conceived of at a regional, working landscape level, as regions are often defined by either their

land use or biogeographical similarity, which in many cases, renders them equivalent in scale to catchments — the level at which many natural resources are derived (Barnett 2001). A working landscape may consist of cropland, pastureland or rangeland, and much of Australia is comprised of 'working landscapes'. These lands provide food, fibre and many of the resources that are relied upon for everyday use. Lands that support agriculture are a critical natural resource that help sustain people, wildlife and local economies. In fact, much of the wildlife observed whilst enjoying recreational pursuits is dependent upon the wetlands, grasslands and bush found in working landscapes. However, these lands are not inexhaustible, and communities and wildlife throughout the nation depend on sound management of working lands.

Ecosystem function and integrity at a bioregional scale are reliant upon a system of protected areas, which should be designed and managed to represent and protect biodiversity including the suite of ecological processes, communities, species and gene pools. However, the establishment of conservation reserves has generally been opportunistic and ad hoc (Figgis 1999). There is a strong and critical call for strategic bioregional frameworks for planning and management that reflect nature and society, including multi-stakeholder groups that strive for the establishment of cooperative programs that address ecological, cultural and economic issues at the scale of the regional landscape (Brunkhorst & Bridgewater 1995).

Therefore, the challenge for bioregional planning, as suggested by Phillips (1997, p. 3) is stated thus:

*'[h]ow can the elements of wild nature — its species, genetic traits, populations, habitats, and ecosystems — be maintained in landscapes that also need to produce material goods, environmental services and the many cultural, aesthetic and spiritual benefits that people everywhere want?'*

The answer proffered by bioregional planning is to extend the scale of conservation effort, from the protected areas — even from the expanded

notion of a protected area — to cover whole ecosystems.

The objective of this paper is to review old Australian Biosphere Reserves and compare them to the new application of community-driven Biosphere Reserves in urban and peri-urban regions. This paper provides a theoretical context to the Biosphere Reserve Program. An outline of the origins of the Biosphere Reserve concept and its central tenets are discussed along with an examination of the strengths and weaknesses associated with management and planning frameworks of existing top-down designations. The recent revitalisation of the Program in Australia is illustrated, in light of a new emphasis on bioregional and catchment management, as well as official recognition under the Commonwealth of Australia *Environmental Protection and Biodiversity Conservation Act* (1999). The differentiating factor between old and new Biosphere Reserves is examined, illustrated by a case study of the recently declared Mornington Peninsula – Western Port Urban Biosphere Reserve (Melbourne, Victoria).

#### **THE THEORETICAL CONTEXT OF BIOSPHERE RESERVES IN PRINCIPLE AND PRACTICE**

The failure of individual sectors to solve large-scale human-induced environmental problems has recently led to an increasing interest in collaborative, multi-disciplinary approaches to planning and management. Such approaches enable a larger pool of resources (economic, social and scientific) from which policy makers, land managers and natural resources scientists are being asked to create solutions to social and environmental dilemmas beyond the scope of any single discipline. A holistic approach to environmental planning embraces both the natural and built environments, inclusive of people, plants and animals and cumulatively these environments form part of the total landscape (Ball 2002).

Integrative ecological development paradigms exist and are well known within their own forums (Naveh 2000). However, most of these paradigms remain largely unknown or misunderstood within the context of mainstream

local council, state and federal management and planning bureaucracies. An example is the Biosphere Reserve Program. Biosphere Reserves provide a flexible paradigm for linking many of the world's outstanding conservation areas, centres for basic and applied ecosystem research, and sites for demonstrating sustainable economic uses. Biosphere Reserves are defined as areas, or trans-boundary regions of terrestrial and/or marine environments, internationally designated by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) to promote solutions for the reconciliation of biodiversity conservation and its sustainable use. Biosphere Reserves are designed to confront and address the myriad of issues raised in this process. Three areas of biodiversity — conservation, regional development, and scientific research and monitoring influence a holistic philosophy toward landscape scale human-environment interactions. Davis & Drake (1983) suggest that because Biosphere Reserves acknowledge the importance of resource use along with conservation, they are more acceptable in resolving conflicts between protection and use when strict control over large areas is not feasible.

The concept of 'Biosphere Reserve' emerged from the Program on Man and the Biosphere (MAB) of which it constitutes an essential part. MAB was initiated through a resolution passed by the Biosphere Conference convened in Paris by UNESCO in 1968 as an intergovernmental program of research aiming to develop an interdisciplinary scientific basis for the rational use and conservation of the resources of the Biosphere (Batisse 1982). The Biosphere Conference represented the first assertion, in an intergovernmental context, that the conservation of environmental resources could be achieved alongside their utilisation for human benefit. The concept of the Biosphere Reserve World Network was designed to include existing reserves, but with the important difference of extending, in a systematic manner, protection for many plant and animal genetic resources that were not covered.

Biosphere Reserves fill the conceptual void between human developments and

natural environments, allowing for habitation, resource extraction, community and economic development whilst simultaneously allowing for protection of core biodiversity values through the designation of a buffering zone between the two. Brunkhorst (2000) argues that there is too little understanding of the relationship between society and ecosystems at the scale of biocultural landscapes, which are otherwise known as bioregions. For the purposes of this paper, the term 'bioregion' follows Brunkhorst's definition, referring to a regional landscape scale of matching social and ecological functions as a unit of governance for future sustainability that can be flexible and congruent still with various forms of government found internationally. A nested hierarchy of ecological units such as ecoregions, bioregions and landscapes can be a powerful tool for planning integrated terrestrial and coastal-marine management. Human interaction with the environment occurs mainly at landscape scales, but across relatively short time periods. The regional scale is the critical level at which to reconcile ecological functioning with social institutions if novel solutions are to be developed for natural resource and human sustainability. Biosphere Reserves are presently one of the only planning and management frameworks in Australia for human-environment integration at this scale.

A concentric structure typifies the ideal Biosphere Reserve (Fig. 1). A core area forms the centre and is an area (or multiple areas) devoted to long-term protection, according to the conservation objectives of the Biosphere Reserve. One or more surrounding buffer zones surround the core(s) in which activities compatible with the conservation objectives of the reserve may be carried out. The outer transition area is devoted to the promotion and practice of sustainable development.

#### **THE AUSTRALIAN BIOSPHERE RESERVE PROGRAM**

Within Australia, twelve Biosphere Reserves were added to the UNESCO World Network between 1977 and 1982 in all states except Queensland (Fig. 2). In total, the area of Biosphere Reserves represents 1.35% of Australia's landmass, or 5 692 505 ha.

The Biosphere Reserve Program has received limited attention in 25 years of establishment in Australia, and Cochrane & Muldoon (2000) state that the concept, scope and potential of the Program are not widely appreciated. The initial interest that occurred during the establishment phase did not continue, either in developing individual reserves under their new designation, or in fostering a coherent, successful national Program. Local participation and stewardship was lacking, as was national management.

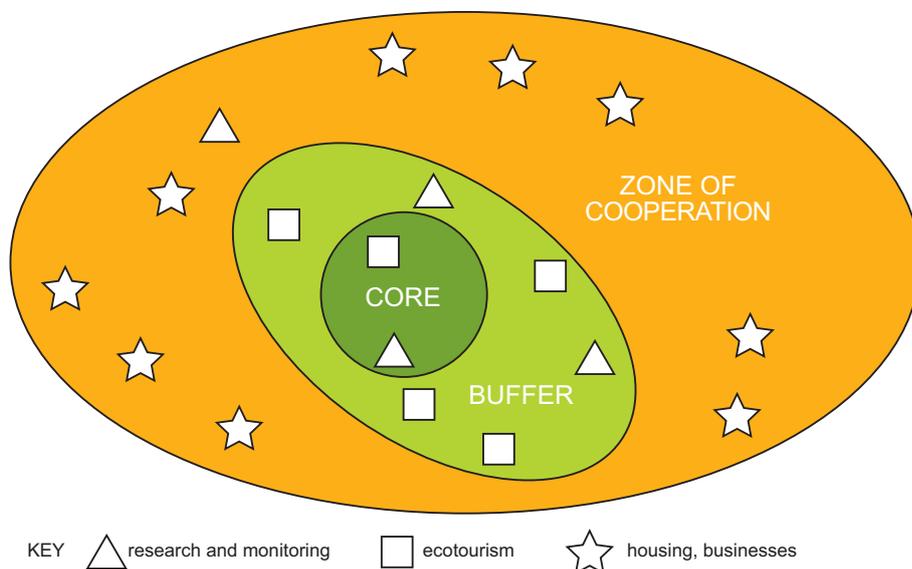
**Old Biosphere Reserves (existing sites)**

The initial phases of the Biosphere Reserve Program focused on the more passive and science-based goals for development of a network for global environmental monitoring — preservation of key examples of the world’s distinctive ecosystems, and conservation of genetic diversity contained within those systems. It was under this set of criteria that most of Australia’s Biosphere Reserves were established and according to these goals, were individually well chosen. However, development of the Program at an international level has left many of Australia’s existing Biosphere Reserves lacking relevance, through a failure to incorporate adequate change to keep pace with international developments, or to adopt the Biosphere Reserve designation as a priority.

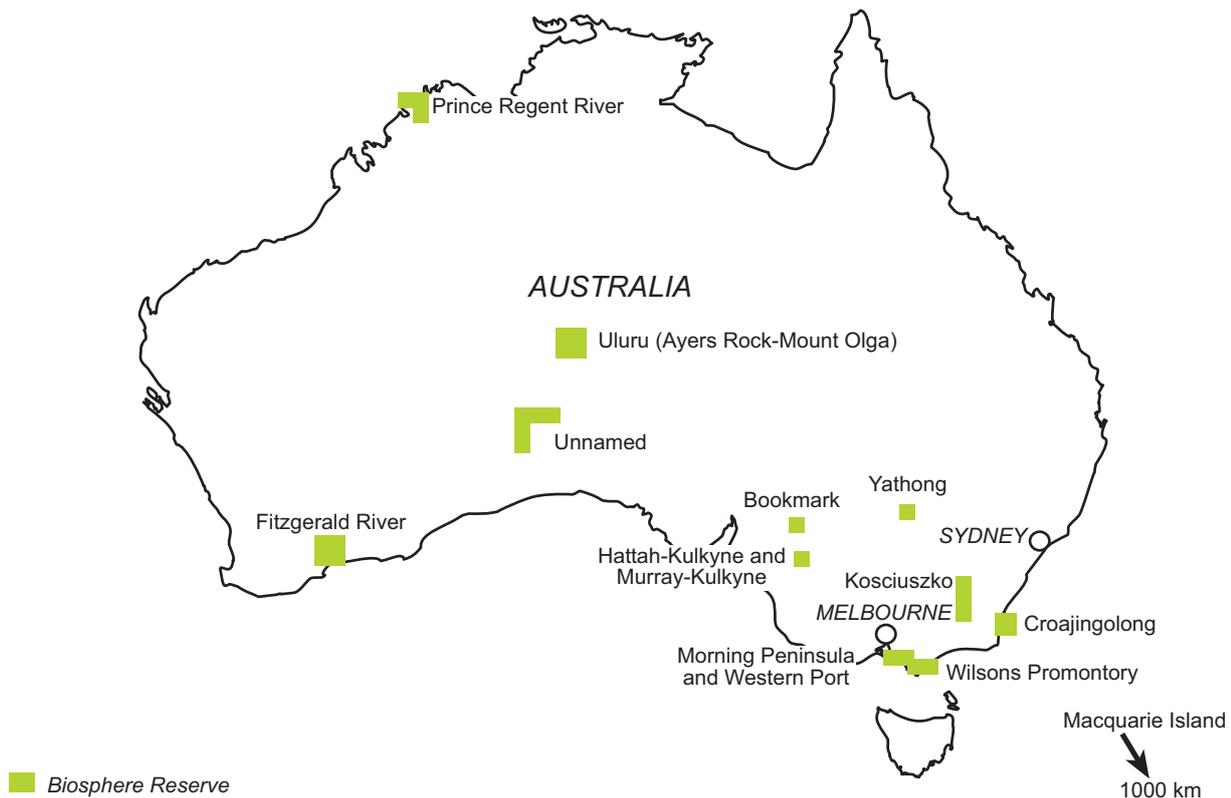
Existing Australian Biosphere Reserves were declared under the auspices of the federal government, after nomination by individual

State or Territory governments. Declaration under the UNESCO/MAB Program was thought to impart an additional recognition to those sites, further emphasising their importance as existing national parks or conservation reserves. Biodiversity conservation were prime concerns of the Program, and was intended to further understanding of the biodiverse areas contained within declarations.

Ten of Australia’s twelve Biosphere Reserves are almost entirely protected areas, managed by government conservation agencies (nine by state authorities and one by the federal government). Inconsistent management and legislative protection between individual agencies of existing Australian MAB reserves posed a significant hindrance until 1999, when the *Environment Protection and Biodiversity Conservation Act* (EPBC) was passed, and provisions were made for Biosphere Reserves under legislative protection. The EPBC Act states that the Commonwealth may formulate management plans for any Biosphere Reserve within Commonwealth areas, and may cooperate with States and Territories to prepare management plans for Biosphere Reserves within States or Territories. Such plans must be consistent with the Australian Biosphere Reserve Management Principles, which are set out in the EPBC Regulations. The Act specifies that the Commonwealth may give financial assistance for the protection or conservation of a Biosphere Reserve (Environment Australia 1998).



**Fig. 1** An ideal Biosphere Reserve. (Adapted from UNESCO / MAB; Biosphere Reserves in a Nutshell; <http://www.unesco.org/mab/nutshell.htm>).



**Fig. 2** Locations of Australian Biosphere Reserves.

The status of Australian Biosphere Reserves vary from site to site, with some reserves more closely fulfilling the requirements of the Statutory Framework for Biosphere Reserves than others. Many reserves are limited by geography in their ability to participate in all aspects of the Biosphere Reserve Program (Parker 1993). Variations in local circumstances such as land use, tourist numbers to the core areas (National Parks), population and local governance, impact upon the degree to which a site may function as a Biosphere Reserve. Due to the long history of the designation and management of National Parks and World Heritage Areas, and associated wilderness in Australia, Biosphere Reserves are often viewed as superfluous, illustrated by the management of these areas under the auspices of their respective National Park Management Plans and managers (Parker 1993).

Despite statements regarding the guidelines and benchmarks for Biosphere Reserves contained within the EPBC Act, there is a strong degree of limitation in some Biosphere Reserves. The de-listing of one of Australia's

longest standing designations illustrates such limitation. The South-West National Park Biosphere Reserve (Tasmania), which was declared during the early flourish of the Program, was officially revoked in February 2003. This reserve is the first Australian Biosphere Reserve to be de-listed. One of the major problems associated with the listing of the South-West was that existing National Park and World Heritage Area designations competed with Biosphere Reserve status. Even if only in theory, the multiplicity of designations for the region was considered problematic (G. Copson pers. comm. 2003). The difficulties experienced in applying Biosphere Reserve principles in the South-West are common to other Biosphere Reserve designations similarly compromised through multiple protected area designations.

In contrast, the most successful Australian Biosphere Reserves are undoubtedly those that were designated under a federal government 'model program' — Bookmark Biosphere Reserve and the Fitzgerald River National Park. These Biosphere Reserves received an advantage as recipients of seed funding and

assistance from Commonwealth and State authorities. This aid has not been extended to other Australian Biosphere Reserves, and as a result, others do not feature as prominently or successfully in the Australian Network.

#### **New Biosphere Reserves (urban and peri-urban)**

Illustrative of the new application of Biosphere Reserves are those declared in bioregions containing urban areas. Biosphere Reserves can encourage a regional view of sustainable development and strategic planning, recognising that urban planning and greater bioregional management cannot be separated. The emerging new generation of Biosphere Reserves are fundamentally different to the original suite reserves. The difference lies in the bottom-up approach, where communities gain interest through other residents or community champions of the concept. Driven from a grass-roots level, new interest has been spawned in the otherwise dormant Program (with only a couple of exceptions, both of which maintain strong community drive).

UNESCO's MAB Program developed the first internationally recognised mission to consider cities as ecological systems. The accumulated two decade-long experiences of over 100 studies in all regions of the world — covering a wide spectrum of biogeographic, bioclimatic, economic, social, cultural, political and development situations — have contributed to an improved knowledge and understanding of these complex and variable human systems, and to establishing the bases for an ecological paradigm of urban / peri-urban / industrial systems (UNESCO 1998). The Program has been dedicated to improving the efficiency, self-sufficiency and humanness of cities, minimising their impact on near and distant hinterlands in an effort to making them more sustainable, conserving and liveable (Celecia 1996).

The establishment in 2000 of the MAB International ad hoc Working Group to Explore the Application of the Biosphere Reserve Concept to Urban Areas and their Hinterlands (the MAB Urban Group) was a significant step in the progression of the Biosphere Reserve Program.

The objectives of the MAB Urban Group are to:

- Identify contributions that the Biosphere Reserve concept have made or could make in urban planning and management, including in the context of the Convention on Biological Diversity with its focus on the ecosystem approach
- Examine if there is, or should be, a place for urban areas and cities in the World Network of Biosphere Reserves (beyond serving as transition areas)
- Explore alternative ways and means of recognizing selected cities, or parts thereof, as sites that exemplify the Biosphere Reserve model
- Stimulate a discussion within MAB and with relevant partner institutions and organisations, on the development of an agenda for possible future MAB activities in this area (UNESCO 1998, p. 5).

The Urban Group is producing recommendations concerning the appropriate application of the Biosphere Reserve concept to urban areas and their hinterlands. These contributions include suggestions for collaboration among established Biosphere Reserves with an interest in urban/ peri-urban issues; options for how MAB best could recognise efforts towards more sustainable urban development and management, if such efforts are to be recognized; and outlining elements of a possible future interdisciplinary research agenda on the Biosphere Reserve concept in relation to urban areas and their hinterlands. The work of this group is furthering the concept of Biosphere Reserve application and contributing to a broader appreciation of the basic differences between traditional protectionist approaches such as World Heritage Areas and National Parks and the integrative regionalist Biosphere Reserve approach.

#### **THE MORNINGTON PENINSULA – WESTERN PORT URBAN BIOSPHERE RESERVE**

The Mornington Peninsula, situated approximately 70 km south-east of Melbourne is about 50 km long and 16 km wide. The 175 km long peninsula coastline extends from Frankston in Port Phillip Bay, southward to Bass Strait, then northward to Quail Island in Westernport

Bay. The Mornington Peninsula – Western Port Urban Biosphere Reserve establishes a set of challenging objectives in relation to local, national and global issues of sustainability. The Mornington Peninsula, that part of Port Phillip Bay that abuts it, and Western Port and its catchment, including Phillip and French Islands, form what is recognised as one of Victoria's most biologically diverse regions (Mornington Peninsula Shire Council et al. 2002).

The region also sustains some of Victoria's most valuable farming activities, including a flourishing wine industry, horticulture, dairying, cattle grazing and cut flowers. Both Port Phillip and Western Port are important for recreation and commercial fishing and an expanding aquaculture industry. Land clearance and its impact on water quality, along with the enormous demands being made on the marine environment are issues of concern for the sustainable use of the region. Parks are a fundamental component in protecting the region's diverse range of ecosystems, and there is growing recognition that conserving biodiversity and caring for nature encompasses all land, both urban and rural.

The Mornington Peninsula – Western Port region was proposed as a Biosphere Reserve (Fig. 3) because of its outstanding values, which include:

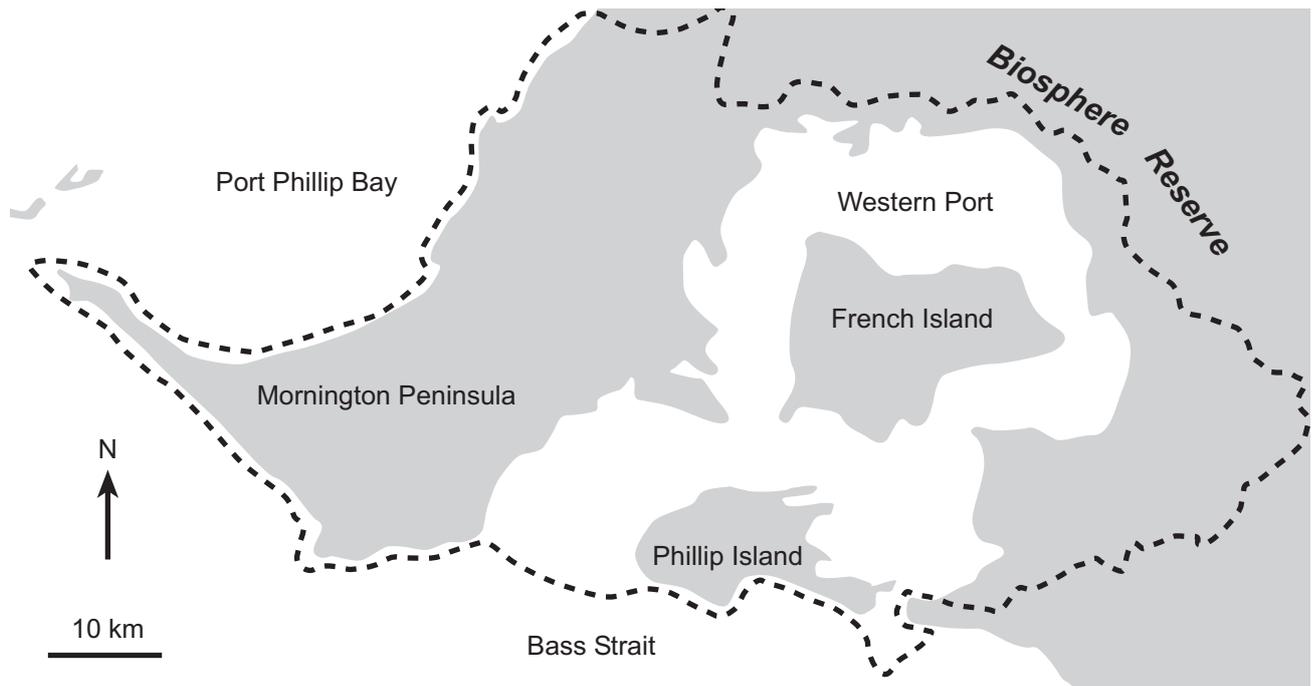
1. French Island, which supports a higher diversity of animals than on comparable mainland areas. The island is nationally significant because of its undisturbed and continuous range of habitats
2. Western Port, one of the state's most used marine areas for commercial and recreational purposes, is an area of great biological diversity. It features a wide range of habitat types, including deep channels and seagrass meadows, mangroves, saltmarsh and melaleuca thickets. Also present are a wide variety of marine invertebrates and about 65% of Victoria's bird species
3. The Mornington Peninsula, which features outstanding landscapes and sustains some of the state's most valuable land (Mornington Peninsula Shire Council et al. 2002).

The recommendation for a Biosphere Reserve in the Mornington Peninsula – Western Port was first mooted in the 1998 French Island Management Plan by Parks Victoria. The first community meeting in support of the proposal was held in June 1999. This led to the establishment of a working group consisting of community representation, and founding partners including the Mornington Peninsula Shire Council; Parks Victoria; The Department of Infrastructure; Royal Melbourne Institute of Technology; and Phillip Island Nature Park. In 2000, a further recommendation for the area as a Biosphere Reserve was reiterated in the Environment Conservation Council Marine Coastal and Estuarine Investigation Final Report (The Environment Conservation Council Victoria) and in the Phillip Island Nature Park Management Plan (Phillip Island Nature Park). The Reserve was officially declared by UNESCO in November 2002.

The Biosphere Reserve was designed in two phases. Phase one covers approximately 2100 km<sup>2</sup>, including a permanent population of 180 000 and a seasonal population of approximately 270 000. Phase two extends the area of the Biosphere Reserve to 3400 km<sup>2</sup>. Five Shire councils are incorporated within the Biosphere Reserve area: Mornington Peninsula, Frankston, Bass Coast, Cardinia City and Casey. Local Catchment Management Authorities are also significant within the administrative area of the Biosphere Reserve (Mornington Peninsula Shire Council et al. 2002).

The Mornington Peninsula – Western Port Biosphere Reserve is driven by the founding partners, assisted by the interim committee comprised of various specialists, interest groups and community members. The committee sought community support for the project, including conducting workshops, educating the public, obtaining seed funding and commissioning a consultant to evaluate the potential economic opportunities and outcomes of the Biosphere Program.

Brunkhorst (2000) states that the Biosphere Reserve Program is one form of bioregional planning that has long proposed regional-landscape scale, integrated 'on-ground' models



**Fig. 3** Mornington Peninsula – Western Port Biosphere Reserve.

be developed with local communities. A Biosphere Reserve gives local communities new responsibilities for their own sustainable future while providing a thread to re-sew peoples' identity to the landscape. This contrasts with managing their own 'patch' in isolation and/or being excluded from ownership and responsibility for managing nearby public land in a wider context.

Four areas of Integrated Local Area Management (ILAM) facilitate the success of an urban Biosphere Reserve (Brown 1995, p. 10):

1. Policy integration where policy communities are formed through a vertical integration. All the stakeholders including both government (federal, state and local) and community interests develop a common policy direction, through negotiation between all stakeholders. The natural policy communities on most long-standing issues collaborate on a continuing basis, rather than the present mainstream ad hoc approach
2. Practical integration through the development of multi-skilled teams through a horizontal integration. A range of occupations and skills are needed on any one local issue, from approving development applications to regenerating sand dunes, and regular team

- meetings are held. Decisions are made in concert, using mediation and facilitation, rather than sequentially or in opposition
3. Problem solving integration through the synthesis of all evidence by utilising holistic thinking. Social, economic, environmental and management aspects of an issue are interconnected, and recognised as of equal importance in decision making on any issue
4. Integration by scale and place is achieved through working towards community goals otherwise known as the local vision. Policy, practice and problem solving only exert an influence when they are applied to specific localities. Scenarios, community needs analyses, projections and guided imagery may all help communities to articulate their shared vision.

Although a formal ILAM program was not intentionally implemented at the Mornington Peninsula – Western Port Urban Biosphere Reserve, all of the elements of such a program exist, which has aided communication and implementation. An integrated and localised approach driven by an engaged community is the key to the success of Urban Biosphere Reserves.

Sustainable development initiatives for the Mornington Peninsula – Western Port Urban

Biosphere project will enhance rather than replace existing programs and arrangements, including:

- A program accrediting sustainable land and water uses, with accreditation being used to promote and market products and services
- Encouraging improved agricultural practices through cooperative programs
- Encouraging further ecotourism opportunities
- Developing regional environmental performance indicators that measure environmental improvements
- Developing partnerships with scientific, educational and industrial organisations to conduct research into the region's natural systems
- Developing voluntary codes of practice covering the recreational use of land and marine ecosystems
- Attracting funding for the reserve through grants and sponsorships
- Enhancing communication networks, including visitor centres (Mornington Peninsula Shire Council et al. 2002).

Initiatives under the new Biosphere Reserve designation include a Sustainability Framework, developed and implemented by a local Shire council, in consultation with the local community. The Framework delineates values the community regarded to be most significant, where each value corresponds to existing or developed local council policies. Proponents of new developments within the Shire are required to consider and address the Framework, prior to consulting with the Shire council regarding specific development issues. The Sustainability Framework has assisted the council in applying the Biosphere Reserve concept to an urban and peri-urban area, through balancing community values with sustainable development criteria, and through priority for a long-term environmental vision.

#### **SUMMARY**

Recognition of landscape scales for human impact management and integration of people and their local environment for social, economic and environmental sustainability highlights deficiencies in current practices of planning

and management in urban environments.

The Biosphere Reserve Program has been a theoretical model for bioregional sustainability, but only recently recognised for its practical and active potential in this way. Until recently, the Biosphere Reserve Program experienced very limited success and received little interest from either relevant government agencies or the community for more than two decades of implementation due largely to a government-led model concerned with passive, science-based goals. Some exceptions exist, for example, the Bookmark and Fitzgerald Biosphere Reserves, which have exhibited greater success due to financial input from government. Therefore it is argued that Biosphere Reserves implemented in a government-led manner in Australia will only succeed with the initial and ongoing financial assistance of some outside agency such as the federal government.

New Biosphere Reserves are those driven by local community in partnership with local councils toward a coordinated bioregional planning and management vision. The Mornington Peninsula – Western Port Urban Biosphere Reserve indicates an integrated local area management approach that is cross-jurisdictional, trans-disciplinary and cross-sectoral at a municipal level. This model may be useful for other urban and peri-urban regions considering ecological development alternatives, both in Australia and overseas. Although a new reserve, the Mornington Peninsula declaration indicates that it is presently succeeding and will continue to achieve incremental conservation practices through this bioregional urban planning approach.

#### **ACKNOWLEDGEMENTS**

I would like to extend my thanks to the CSIRO Sustainable Ecosystems Urban and Regional Futures Group for their support of my project through the CSIRO Postgraduate Top-up Scholarship, particularly Guy Barnett for his supervision. I also greatly appreciate the support and assistance of my supervisors Dr Lorne Kriwoken and Dr Elaine Stratford at the Centre for Environmental Studies, University of Tasmania. Thanks also to Geoff Copson, Department of Primary Industries, Water and Environment, for a valuable interview in March 2003.

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