



Blue Mountains World Heritage Institute

Research Strategy

2009-2012

The Institute acknowledges the Darug, Gundungurra, Wanaruah, Wiradjuri, Darkinjung and Tharawal Nations as the traditional owners of the Greater Blue Mountains World Heritage Area

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I INTRODUCTION

The founding of the Blue Mountains World Heritage Institute (BMWHI) in 2004 was a response to the recent World Heritage status awarded the Greater Blue Mountains, along with the recognition of the increasing challenge and complexity of contemporary governance of natural resources. The Institute was established as an independent not-for-profit organisation to address the production and use of knowledge for the conservation and management of the Greater Blue Mountains World Heritage Area (GBMWA).

The Greater Blue Mountains was added to the World Heritage List in 2000. It comprises eight national parks covering over one million hectares. World Heritage status was awarded on the basis of two criteria: (i) outstanding examples of ongoing ecological and biological processes significant in the evolution of Australia's highly diverse ecosystems and communities of plants and animals, particularly eucalypt-dominated ecosystems. The combination of fine-scale spatial variation, high environmental complexity and exceptional stability over evolutionary time has allowed this environment and its biota to remain largely unchanged over geological time; and (ii) significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation, in particular the eucalypts and eucalypt-dominated communities. The site provides significant representation of Australia's biodiversity with ten percent of the vascular flora as well as significant numbers of rare or threatened species, including endemic and evolutionary relict species, such as the Wollemi pine (*Wollemia nobilis*).

The GBMWA is a large-scale conservation initiative to protect biodiversity and ecosystem services that are facing unprecedented pressure from drivers of ecosystem change (such as climate change, fire, introduced species, agri-industry and urbanisation). The GBMWA fringes the Sydney basin, Australia's largest conurbation, and the protected area is intersected by a transportation and urban development corridor. It is also the primary catchment for Sydney's water supply and is a significant international tourist destination.

The Institute brokers and facilitates the production and use of knowledge for the GBMWH, which addresses the following needs:

- Identification of knowledge gaps, and development and implementation of appropriate research programs which will assist in managing and conserving the GBMWH, and in periodic World Heritage reporting.
- A coordinated and coherent research effort for the region - there has been an identified need on the part of managers and policy-makers in local, state and federal government agencies responsible for the area to have research priorities identified and to have more contextualised research carried out across the region.
- Integration of the different values and objectives across the range of stakeholders and management agencies.
- Integration of all kinds of knowledge (quantitative and qualitative including scientific, community and indigenous) into planning processes using an adaptive management approach.

This Research Strategy is guided by the Blue Mountains World Heritage Institute Strategic Plan 2009-2012 and the Strategic Plan of Management for the GBMWH (2009), and has the following purposes:

- To outline the Institute's principles of, and approach to, research.
- To clarify for any researcher, research user or potential funding body, how the Institute undertakes its business of research.
- To provide the framework for a prospectus of research projects to be implemented.

2 RESEARCH PRINCIPLES

2.1 Interdisciplinary and collaborative whole-of-system approach

A whole-system approach is needed for environmental problems to be effectively addressed, including the complexity of causes and conditions that give rise to them. Research needs to include the ecological, socio-cultural, political and economic dimensions of problems that have traditionally been addressed from the perspective of a single discipline. Conservation is a complex, interdisciplinary process, not simply a biological or technical challenge, and social factors play a critical role in the success or failure of conservation programs.

Strong connections between the natural and social sciences are important, and research methods need to be both qualitative (evidence-based) and quantitative (values-based), bringing together the physical and biological sciences with the humanities and social sciences. A variety of methodologies are important, to collect both quantitative and qualitative information.

The Institute's research framework is designed to facilitate meta-analysis that focuses on synthesising and interpreting results from individual studies across disciplines.

2.2 Relevant research integrated into policy and management

Research needs to be connected with policy, management, on-ground implementation and human livelihoods. The membership base of the Institute includes agencies responsible for GBMWH management and policy, to ensure the direct engagement of these agencies in planning and implementing research, whose outcomes are then integrated into policy and management.

2.3 Independent brokerage

The Institute is an independent knowledge broker that brings together academic, regulatory and community interests in the policy and management process. The Institute may take positions on strategic issues, but more usually its role is to provide knowledge to better inform the positions taken by advocacy groups.

2.4 Indigenous knowledge

The Institute values the knowledge and culture of the traditional Aboriginal custodians of the World Heritage Area, and gives priority to the active involvement of Aboriginal people in the process of research and seeks to meaningfully revive Indigenous knowledge in a contemporary way. In the process of knowledge transfer it is important to ensure that control and management of Indigenous knowledge remains in the hands of the local Aboriginal communities who own it. This involves developing protocols in liaison with Aboriginal communities, addressing issues of ethics and intellectual property and acknowledging understanding of different knowledge systems.

2.5 Community engagement

The Institute affords high priority to engaging the public in the protection of the GBMWHA and encouraging community stewardship. A key principle of the Institute's community engagement approach is moving beyond consultation, to participation and active involvement by using more inclusive processes. The Institute uses the process known as community cultural development (CCD) as a methodology for participative and qualitative research. This approach is based on the use of the creative arts as a catalyst for community participation and an accessible expression of ideas. CCD processes are used to explore environmental values and communication through the visual arts with exhibitions, video and art workshops. CCD processes can build knowledge and understanding in relation to environmental issues and encourage innovative ways of thinking to resolve complex and sometimes contentious environmental issues.

The Institute's community engagement includes:

- Innovative approaches and case studies of best practice for community participation, including methodologies that create dialogue relating to environmental issues;
- Education programs based on World Heritage values for schools and the general public;
- Making science accessible to non-scientific audiences and informing the public about research outcomes and implications, through public forums including lectures, seminars and workshops;
- Facilitating discussion between disparate stakeholders for better understanding of complex issues.

3 PROCESS FOR GENERATING RESEARCH

3.1 Identifying research needs

The Institute's Strategic Plan (2009-2012) defines the following strategies for identifying research needs for the GBMWHA:

- Collectively identifying and prioritising policy and management issues.
- Identifying knowledge gaps in relation to policy and management issues.

These strategies are addressed by:

- Reviewing documentation in relation to policy, research and management of the GBMWHA and of global best practice in protected area management;
- Consulting with agency staff, community members and researchers to identify issues and research needs;
- Holding periodic forums with stakeholders to promote dialogue on the range of policy and management issues, approaches, and research needed.

A prospectus of research projects is maintained based on the identification of research needs. This prospectus is used as the basis for implementing research.

3.2 Implementing research

The Institute brokers, coordinates and monitors the implementation of the research outlined in the prospectus by:

- Identifying and coordinating researchers to develop and implement research proposals with clear and achievable objectives and outcomes that can inform policy and management.
- Calling for expressions of interest from researchers to participate in projects are circulated through the Institute's member organisations and through academic and other networks.
- Facilitating adequate resourcing of the projects through grant applications and sponsorship.
- Holding quarterly Research Committee (see 3.5) meetings to guide implementation of the projects and assist the direction and delivery of relevant and high-quality research products and outcomes.
- Negotiating with State and Commonwealth agencies to advise research priorities that may come under their core activities.

3.3 Research partnerships

Research partnerships are developed and maintained based on:

- Memorandums of understanding for well-articulated, realistic and effective partnerships built on respect, trust and confidence that:
 - clarify who can deliver what and by when;
 - establish and maintain disciplined processes.
- Maintaining frequent communication with partners and researchers to ensure common objectives are being met and that interests don't diverge, and that there is ongoing delivery of products and outcomes that match the strategic intent of partnerships.

3.4 Research uptake

Research outcomes are translated into policy and management for the GBMWHA by:

- Interfacing between researchers and managers to facilitate uptake of research outcomes into management
- Advocating for research outcomes to influence policy by working collaboratively with other local environmental groups and networks and engaging with policy/ministerial advisers
- Monitoring and reporting on the influence of research outcomes on policy and management

3.5 Quality assurance

The Institute has a Research Committee of the Board of Directors comprising representatives of member organisations and invited specialists. The Committee's membership and terms of reference are available on the BMWHI website. The Committee makes recommendations to the Board on the research objectives and activities that are facilitated by the Institute and helps to ensure that research activities are rigorous and relevant, are in accordance with the principles and criteria identified in the Institute's Research Strategy, are delivering on objectives within agreed timeframes and are in accordance with the Institute's Constitution, Strategic Plan and Business Plan, as well as with the Strategic Plan of Management for the GBMWHA.

4 RESEARCH FRAMEWORK

The Institute's research framework, outlined below, addresses the management issues, objectives and outcomes identified in the 2009 Strategic Plan of Management for the GBMWH. The research is organised within two broad programs - Natural and Cultural Heritage, and Sustainable Development. There is necessarily overlap between the programs and issues identified below. Community engagement (as outlined in 2.5) is undertaken in relation to this range of issues.

- **Natural and Cultural Heritage**
 - Integrity of the protected area
 - Biodiversity
 - Geodiversity
 - Water catchment protection
 - Cultural heritage (Aboriginal and non-Aboriginal)
 - Landscape, natural beauty and aesthetic values
- **Sustainable Development**
 - Major impacts related to urban and agri-industrial development
 - Recreation and visitor use

4.1 Natural and Cultural Heritage

Integrity of the protected area

Efforts to protect the current and future overall integrity of the World Heritage Area includes:

- Evaluation of areas of potential outstanding universal value, or that improves the integrity of the GBMWH, as additions to the protected area.
- Building the knowledge base for World Heritage and other values of the GBMWH, such as documenting the location and extent of values.
- Monitoring the trends in the state of the World Heritage values over time.
- Systematic monitoring of the impact of threatening processes (including environmental changes partly or largely attributable to global climate change) on World Heritage values.
- Informing governance, plans of management, and cooperative management.
- Understanding impacts of climate change on the World Heritage Area.
- Informing strategic policy formulation and planning.
- Developing an adaptive management approach with clearly defined management objectives for integration of research and for ongoing monitoring and assessment of management actions. This enables effective decision-making in the management of ecological systems undergoing rapid and unpredictable changes and where knowledge gaps and uncertainty are significant.

Biodiversity

Research to help conserve the GBMWH's biodiversity and ensure the ecological viability and capacity for ongoing evolution of its World Heritage and other natural values includes:

- Generating knowledge for input into an integrated data storage and retrieval system accessible to managers in all relevant agencies to provide information relevant to improved management of World Heritage and other values.
- Informing current pest species management and fire management priorities and programs to ensure they are adequate for conservation of biodiversity and maintenance of World Heritage values.
- Building the knowledge base for drivers of change in the ecosystems of the GBMWH including fire, climate change, invasive species and disease.
- Monitoring the direct and indirect impacts of threats and their synergistic impacts on ecosystem processes and services, with temporal and spatial predictions for how these impacts may threaten ecosystem composition, structure and function.
- Understanding implications of climate change including the capacity of native species to adapt, the response of invasive species, and implications for bushfire behaviour.

- Documenting impacts of fire regimes and pest control on biodiversity.
- Ecosystem-based research that aims to assist management agencies to respond quickly and adaptively to environmental signals and to confront the uncertainty of complex systems.
- Research that helps understand the dynamics of complex chaotic systems and ecosystem resilience, since this is particularly relevant to predictions of fire behaviour and system changes in response to climate change.
- Defining conservation targets such as desired states and thresholds of concern (the upper and/or lower limits of flux in environmental variables), that specifies the boundaries of the desired state of the target variable (e.g. species of conservation concern).
- Monitoring species in accordance with clearly defined objectives, including long-term and intensive collection of biodiversity data at strategic sites within the World Heritage Area.

Geodiversity

Research to protect the geodiversity of the WHA includes:

- Understanding the relationship of geodiversity with World Heritage values and informing a program of better protection of geodiversity.
- Recording and assessing the significance of the geodiversity values of the GBMWHa against State, National and World Heritage listing criteria.
- Increasing our understanding of the potential impacts of climate change on Karst systems.

Water catchment protection

Research to maintain and improve the water quality and water catchment values of the GBMWHa includes:

- More rigorous scientific analysis for setting appropriate and responsible discharge limits for waste discharges into water (with community involvement).
- Studying the social ecology of water use, including values, attitudes and behaviours.
- Maintaining environmental flows for biodiversity conservation.
- Identifying and quantifying:
- Sources of nutrients, sediments and pollutants entering waterways and reservoirs from natural and human sources that could potentially affect water quality and storage capacity.
- Natural and human sources of pathogens.
- Key ecological communities and processes that influence water quality.
- Impact of human activities on stream and catchment ecology (rural land use and riparian, urban/peri-urban development, environmental flows, recreational access, algal growth and ecotoxicology, invasive species).
- Impacts of groundwater extraction on hanging swamps and associated threatened species.
- Impact of fire, floods and extreme events on sediments and nutrients entering streams, rivers and reservoirs.

Cultural heritage (Aboriginal and non-Aboriginal)

Research to identify, formally recognise and protect the cultural heritage values of the GBMWHa, and to facilitate co-management of the GBMWHa with local Indigenous people includes:

- In partnership with local Aboriginal communities, appropriately documenting the Indigenous cultural values of the GBMWHa.
- Recording and assessing the significance of the cultural heritage values of the GBMWHa against State, National and World Heritage listing criteria.
- Cultural heritage research projects which assist with the protection and management of the GBMWHa's cultural heritage values.
- Research that facilitates recognition of non-Aboriginal heritage values, including cultural material, art inspired by the landscape, relationships between people and the environment, early conservation campaigns and built heritage.
- Understanding the relationships between natural, cultural and movable heritage.
- Understanding how Aboriginal people connect and relate to 'Country' and how their aspirations can be met within the western-oriented conservation reserve system.

- Developing better understanding of how change in both the social and environmental contexts is impacting on Aboriginal cultural values.

Landscape, natural beauty and aesthetic values

Research to protect the landscape, natural beauty and aesthetic values of the GBMWHA includes:

- Recording and assessing the significance of the natural beauty and aesthetic values of the GBMWHA against State, National and World Heritage listing criteria.
- Research to inform management activities and visitor use within and adjacent to the GBMWHA so that they have minimal impacts on the area's scenic and aesthetic values.

4.2 Sustainable Development

Major impacts related to urban and agri-industrial development

Research to reduce the potential for major impacts to adversely affect the integrity of the GBMWHA includes:

- Assessing the impacts of surrounding land uses on World Heritage values.
- Connectivity of the GBMWHA with adjacent natural areas.
- Exploring more sustainable alternatives for economic production and development and seeking approaches that resolve conflicting perspectives.
- Informing ways to minimize impacts of surrounding land uses and encourages more sustainable development strategies.
- Assessment of impacts of agriculture and urban development on the values of the GBMWHA.
- Exploring alternatives for industry, agriculture and urban development around the edges of the World Heritage Area, which are more compatible with World Heritage values, focusing on better integration between 'on-park' and 'off-park' management.

Recreation and visitor use

Research to inform an appropriate range of recreation and visitor use, consistent with the protection of World Heritage and related values includes:

- Research to ensure that the potential and existing social and economic benefits derived from visitation are consistent with the protection of World Heritage and other values.
- Assessing impact of tourism on the values of the GBMWHA.
- Research to inform decision-making by government agencies to help ensure that the prime consideration in the face of increasing pressures for recreation and access is the conservation and protection of the values of the GBMWHA.
- Finding mechanisms for ensuring that tourism is a vehicle for conservation of the GBMWHA.