Resilience and Social-Ecological Systems:

The UNESCO Biosphere Reserve Program in Australia and Canada

by

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This thesis contains no material which has been accepted for a degree or diploma by the University or any other institution, except by way of background information and duly acknowledged in the Thesis, and to the best of my knowledge and belief no material has previously been published or written by another person except where due acknowledgment is made in the text of the thesis. The author has previously published some original sections of this thesis.

Signed……

Kate A. Matysek

Date……

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Abstract

United Nations Educational, Scientific and Cultural Organisation (UNESCO) Biosphere Reserves (BRs) provide an example of an integrated sustainability framework that allows for connection between international, national, state / provincial and local levels of conservation and capacity-building. The three major functions of a BR are conservation of biodiversity, sustainable development and support for logistics. As coupled social-ecological systems, BRs explicitly acknowledge that human systems and ecological systems are inextricably linked, and have the potential to bridge ecological and social-political spheres that have been viewed as predominantly disparate entities, rather than as interconnected or nested systems.

The aim of this thesis is to identify the key features (assets, process and outcome) required to enhance the fit between governance systems and ecosystems using the UNESCO BR model, and develop a framework for establishing BRs as resilient working landscapes. By identifying features that seem critical for linking civil society, institutions and government dynamically across multiple levels, the research addresses the governance dimension of ecosystem management and the social factors that enable such management. The scope of the thesis is limited to developed country contexts.

Data are derived from focus groups, site visits, 52 key informant interviews and literature reviews. The research process utilised an emergent, naturalistic inquiry, characterised by abductive, deductive and inductive methods. Four Australian and four Canadian qualitative case studies support and demonstrate the three phases of the BR resilience conceptual framework developed herein.

UNESCO BRs originated in the early 1970s as international examples of biodiversity conservation and sites of scientific research and monitoring. Since this time, the international program has broadened to include more complex notions of social-ecological systems, reflecting shifts in environmental discourse and praxis. The Australian BR Program is characterised by government-initiated BRs and those generated though community-derived stewardship. Over the same period, the Canadian BR Program has consistently developed through community capacity and the Canadian Biosphere Reserve Association.

Capital assets and ‘new governance’ processes are two of the three key phases of developing a successful (resilient) BR. Adaptive capacity is a key component of the final phase; the achievement of a resilient working landscape. In the framework, evolution and devolution of a BR occurs in response to social and ecological variables. However, maintenance and renewal of capital assets are crucial to sustaining the first and most fundamental phase of BR resilience.

Specific guidelines for the application of the BR resilience conceptual framework are provided to inform individual BRs and their national programs more generally, and provide any party interested in the BR concept with a means to develop a resilient BR, from its inception. Avenues for future research are suggested, with a recommended focus upon harnessing greater understanding of resilience factors in social-ecological systems, and the relationship of these to BRs.

Keywords: UNESCO Biosphere Reserves, resilience, social-ecological systems, working landscapes, capital assets, new governance, adaptive capacity, Australia, Canada.

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Table of Contents

List of Figures

List of Tables

Acronyms

A2A	Alps to Atherton (Australia)
ABV	Australian Biosphere Volunteers (Australia)
ALT	Australian Landscape Trust (Australia)
BAG	Biosphere Advisory Group (Australia)
BR	Biosphere Reserve (UNESCO)
BPBA	Bruce Peninsula Biosphere Association (Canada)
BRIM	Biosphere Reserve Integrated Monitoring Program
BRP	Biosphere Reserve Program (UNESCO)
CALM	Deparment of Conservation and Land Management (Australia)
CBRA	Canadian Biosphere Reserve Association (Canada)
CBD	Convention on Biological Diversity
CBM	Community based monitoring
CBR	Clayoquot Biosphere Reserve (Canada)
CBT	Clayoquot Biosphere Trust (Canada)
CC / MAB	Coordinating Council of Canada / MAB (Canada)
CLARET	Clayoquot Alliance for Research, Education and Training (Canada)
CLM	Community Land Managers (Australia)
CMN	Conservation Management Network
CSBR	Clayoquot Sound Biosphere Reserve (Canada)
CSIRO	Commonwealth Scientific, Industrial and Research Organisation (Australia)
CSO	Civil Society Organisation
CZS	Chicago Zoological Society (United States / Australia)
DEH	Department of Environment and Heritage (previously Environment Australia)
DEWR	Department of Environment and Water Resources (previously DEH) - Australia
EA	Environment Australia (Australia)
EDO	Environmental Defenders Office (Australia)
EMAN	Ecological Monitoring and Assessment Network (Canada)
EMO	Enviromental Management Organisation
ENGO	Environmental Non-Government Organisation
EPA	Environmental Protection Agency (Australia)
FAO	Food and Agriculture Organisation
FBG	Fitzgerald Biosphere Group (Australia)
FBMA	Fitzgerald Biosphere Marketing Association (Australia)
FRNPBR	Fitzgerald River National Park Biosphere Reserve (Australia)

FRNPA	Fitzgerald River National Park Association (Australia)
IBP	International Biological Program (UNESCO)
ICC	International Coordinating Council (UNESCO)
ICSU	International Council of Scientific Unions
ISKM	Integrated System of Knowledge Management
IUCN	International Union for the Conservation of Nature (World Conservation Union)
LPBR	Long Point Biosphere Reserve (Canada)
LPWBRF	Long Point World Biosphere Reserve Foundation (Canada)
MI	Mark I Biosphere reserves (government – derived) (Australia)
MII	Mark II Biosphere reserves (community – derived) (Australia)
MAB	Man and the Biosphere Program (UNESCO)
MABF	Mount Arrowsmith Biosphere Foundation (Canada)
MABR	Mount Arrowsmith Biosphere Reserve (Canada)
MDG	Millenium Development Goals (UNESCO)
MEAFEC	Mount Eliza Association for Environmental Care (Australia)
MISP	Multi-stakeholder Integrative Sustainability Planning
MLA	Main Line of Action (UNESCO)
MPSC	Mornington Peninsula Shire Council (Australia)
MPWPBR	Mornington Peninsula Western Port Biosphere Reserve (Australia)
MPWPBRF	Mornington Peninsual Western Port Biosphere Reserve Foundation (Australia)
NEBR	Niagara Escarpment Biosphere Reserve (Canada)
NEC	Niagara Escarpment Commission (Canada)
NEP	Niagara Escarpment Plan (Canada)
NEPA	Niagara Escarpment Plan Area (Canada)
NEPOSS	Niagara Escarpment Parks and Open Space System (Canada)
NGO	Non – Government Organisation
NHT	Natural Heritage Trust (Australia)
NRM	Natural Resource Management
OMF	Oceanside Monetary Foundation (Canada)
OPG	Ontario Power Generation (Canada)
RAIN	Ravensthorpe Agricultural Initiative Network (Australia)
RBR	Riverland Biosphere Reserve (Australia)
SCRIPT	South Coast Regional Initiative Planning Team (Australia)
SD	Sustainable Development
SEABRN	South-East Asian Biosphere Reserve Network
SES	Social-Ecological Systems

SI / MAB	Smithsonian Institute / MAB
SWBR	South West Biosphere Reserve (Australia)
TBR	Transboundary Biosphere Reserve
TWWHA	Tasmanian Wilderness World Heritage Area (Australia)
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WCPA	World Commission on Protected Areas
WNBR	World Network of Biosphere Reserves
WSSD	World Summit on Sustainable Development
Y2Y	Yellowston to Yukon (United States / Canada)

Australian States / Territories	
ACT	Australian Capital Territory
NSW	New South Wales
NT	Northern Territory
QLD	Queensland
SA	South Australia
TAS	Tasmania
VIC	Victoria
WA	Western Australia

Canadian Provinces	
AB	Alberta
BC	British Columbia
MB	Manitoba
NB	New Brunswick
NL	Newfoundland and Labrador
NS	Nova Scotia
ON	Ontario
PE	Prince Edward Island
QC	Quebec
SK	Saskatchewan

Foreword

The goal should be to seek not detailed knowledge of parts of the system, but improved understanding of the dynamics of the whole system.

Carl Folke

Each stage of human civilization is defined by our mental structures; the concepts we create and then project upon the universe.

Edwin H. Land

The seeds of the future are to be found in the extremes of the present. So our wildest ideas are the ones that give us insights into the surprises of the next few decades.

Steve Cork

Biosphere Reserves are places where nature nurtures the minds, hearts and bodies of the people, and the people strive to live gently and maintain vital processes to sustain themselves and the other species that share the biosphere.

Canadian Biosphere Reserve Association

A biosphere reserve is like a butterfly - if you open the cocoon for it, it is not going to fly. It has to struggle to get out.

Jim Birtch

I think there are some folks who just have experienced the power of working together, and when they get hold of that, it's kind of hard to forget it.

David Spann

All rights reserved.Â Our traditions of analysis in theoretical and empirical ecology have been largely inheritedfrom developments in classical physics and its applied variants.Inevitably, there has been a tendency to emphasize the quantitative rather than the qualitative, for it is important in this tradition to know not just that a quantity is larger than another quantity, but precisely how much larger. It is similarly important, if a quantityfluctuates,to know its amplitudeand period of fluctuation.But this orienta-tion may simply reflect an analytic approach developed in one area because it was useful and then United Nations Educational Scientific and Cultural Organization (UNESCO) Biosphere Reserves strive for a harmonious interaction between humans and nature. As landscapes provide suitable units to mutually address matters of conservation and sustainable development, this study aims to explore the potential and realized contribution of biosphere reserves for landscape governance and management. We emphasize the role of stakeholder participation and cooperation as an overarching condition for integrated landscape approaches.Â Moreover, the biosphere reserve zonation concept can provide orientation to manage the â€œmultifunctionalityâ€ of a landscape and address the associated trade-offs between different stakeholdersâ€™ aspirations. View Biosphere Reserves Research Papers on Academia.edu for free.Â Soviet biosphere reserves became an important instrument for international ecological cooperation. Creation of new national parks led to the spreading semi-protected territories. The aim of this article is to show how Soviet scientists worked out the principles of natural parks and biosphere reserves in the Soviet Union. That research will be of interest to geographers, biologists and conservation activists involved in different ecological activities. Save to Library. Download. The UNESCO World Network of Biosphere Reserves (WNBR) covers internationally designated protected areas, each known as biosphere reserves, that are meant to demonstrate a balanced relationship between people and nature (e.g. encourage sustainable development). They are created under the Man and the Biosphere Programme (MAB). The World Network of Biosphere Reserves (WNBR) of the MAB Programme consists of a dynamic and interactive network of sites. It works to foster the harmonious integration of people