internal report 455

Tropical wetlands in Northern Australia – their value and future

Paper presented at
5th International Conference
on Environmental Futures,
Zurich, Switzerland,
23–27 March 2003

CM Finlayson

June 2003

Supervising Scientist

Tropical wetlands in Northern Australia – their value and future

Paper presented at 5th International Conference on Environmental Futures, Zurich, Switzerland, 23–27 March 2003

CM Finlayson, P Bayliss, MG Bellio & J Lowry

National Centre for Tropical Wetland Research, c/- Environmental Research Institute of the Supervising Scientist, GPO Box 461, Darwin, NT 0801, Australia
(max.finlayson@ea.gov.au)

Registry File No. SG2001/0186

Australian Government

Department of the Environment and Heritage
Supervising Scientist

Contents

Tropical wetlands in Northern Australia – their value and future

Paper presented at 5th International Conference on Environmental Futures, Zurich, Switzerland, 23–27 March 2003

CM Finlayson, P Bayliss, MG Bellio & J Lowry

Introduction

Tropical floodplain wetlands in northern Australia are considered both a valued conservation asset and an economic resource. The floodplains are seasonally inundated following monsoon rains, reverting to dry plains with a few remaining permanent waterholes and swamps. They abut saline mudflats and mangroves along the coast; in effect merging together when inundated by floodwaters. In this respect it is necessary to consider both the saline and freshwater wetlands when considering management issues.

The freshwater wetlands support a highly valued array of plants and animals that have adapted remarkably to the wet-dry cycle and the seasonal patterns of nutrient availability and productivity. The biodiversity values are well recognised, but with a few notable exceptions are not well surveyed. Species surveys have been undertaken on some floodplains and general estimates made of both primary and secondary production. Habitat surveys and mapping has been less common and estimates of areal extent vary widely.

Many of these wetlands still support small numbers of indigenous people with many associated cultural and biophysical linkages. Indigenous people manage many wetlands using traditional methods and increasingly traditional ecological knowledge is being incorporated into contemporary management regimes, sometimes after much contention. The wetlands are also important to other groups of people, notably those involved in cattle production, tourism and recreational activities.

Those wetlands closer to centres of settlement and transport nodes are used for the production of cattle while others are increasingly attracting tourists and others in pursuit of recreation. As development pressures and visitation have increased so have the pressures on the wetlands increased. Foremost amongst the management issues that are now being faced are invasive plants and animals, burning and changed fire regimes, development of infrastructure and fragmentation of habitats, physical disturbance, pollution and waste disposal, saline intrusion and the increasing threat of global climate change and sea level rise. In cases these pressures are extreme and unless checked will result in the degradation of many wetlands and wetland services.

The capacity of various management structures to respond to these pressures is uneven – resources are not adequate or evenly distributed, and institutional arrangements are sectoralised or even antagonistic. In amongst the effort to assert effective managerial regimes across different jurisdictional structures we are also witnessing the resurgence of indigenous rights and expressions of self-sufficiency based on the natural resources supplied by the wetlands and surrounding land.

The long-term future of the floodplains as we recognize and value them will depend on a balance between social interactions and political decisions; however, there is considerable doubt that the information base on which to manage within a contemporary framework will be sufficient. That is, whilst we are aware that problems exist and could develop cooperative approaches to solve these we are on the whole operating with a fragmented and insufficient information base, and generally not within an adaptive management framework. Unless the information ‘issue’ is resolved and truly adaptive approaches implemented we are not confident that existing high values will be maintained into the future.

Powerpoint slides

Tropical Wetlands in Northern Australia: their value and future

Max Finlayson, Peter Bayliss,
MariaGrazia Bellio & John Lowry

National Centre for Tropical Wetland Research
Darwin, Australia

Tropical Wetlands in Northern Australia: their value and future

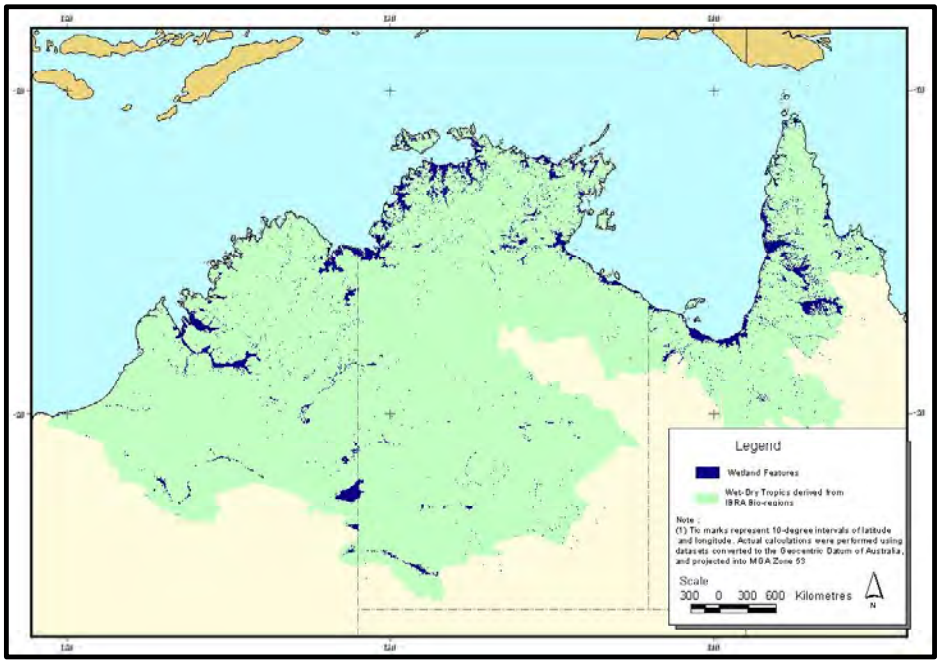
1. Distribution & extent
2. Value - biodiversity
3. Value – use / ecosystem services
4. Future – pressures
5. Future – management / governance

Distribution and extent

- **Inventory incomplete, inaccurate, outdated**
- **Overview / general information only for many locations, species & uses**
- **Effective inventory data collation and analysis still needed**

Distribution and extent

1:250 000 scale topographical maps



Wetland area (km^2) in Australian tropics

Topographical maps (250k)	89 704
Digital Chart of the World	70 078
Matthews natural wetlands	35 649
Australian wetland directory	30 849
CSIRO wetland database	18 539
DISCover land use - IGBP	4 727

Wetland area (km^2) in Australian tropics

- Tropical Aust 90 000
- Australia 242 000 (37%)
- Oceania 358 000 (25%)
- Global 12 770 000 (<1%)

Value - biodiversity

- **Inventory incomplete, inaccurate, outdated**
- **Overview / general information only for many locations, species & uses**
- **Effective inventory data collation and analysis still needed**

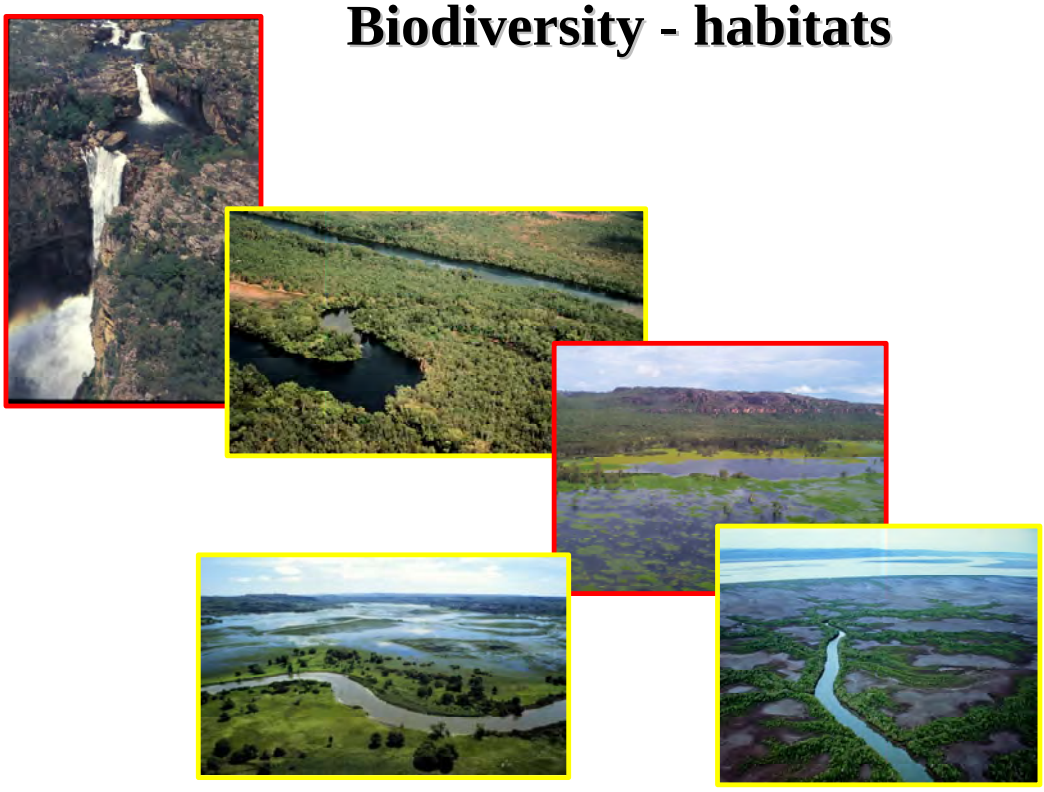
Biodiversity

- **Habitats – not mapped accurately; little agreement on classification**
- **Fauna species – vertebrates generally known; invertebrates knowledge increasing; population sizes and dynamics data uneven to poor**
- **Flora species – macrophytes generally known; microphytes uneven knowledge; population sizes and dynamics data uneven to poor**

Biodiversity - habitats

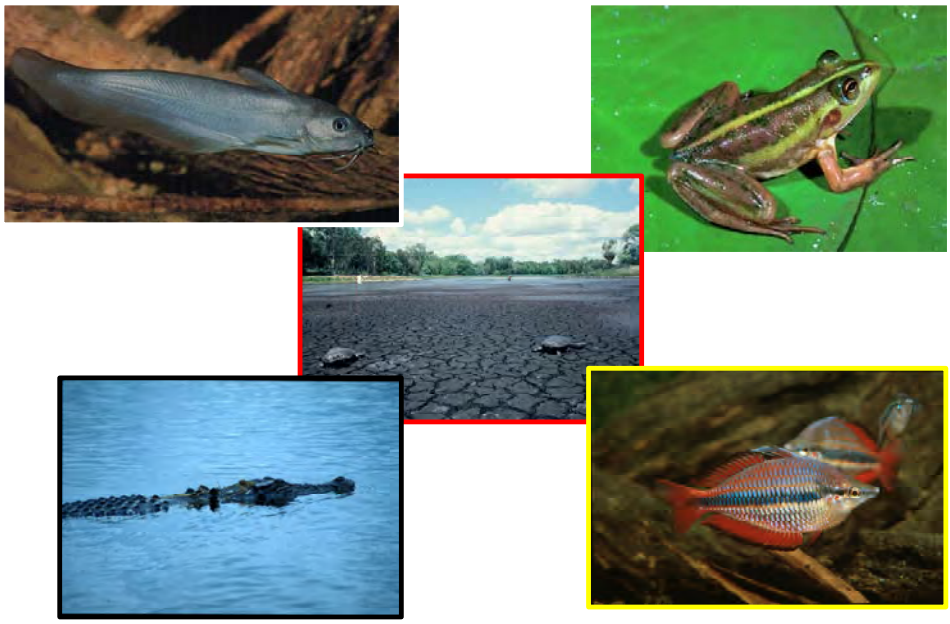
- Tropical swamps – interlinked habitats / freshwater streams & swamps / coastal swamps/marshes
- Stream /swamp hydrology – annual flooding main driving force / dry season and fire / low nutrients
- Coastal swamps – macro-tidal / estuarine reaches extend inland ~100 km

Biodiversity - habitats



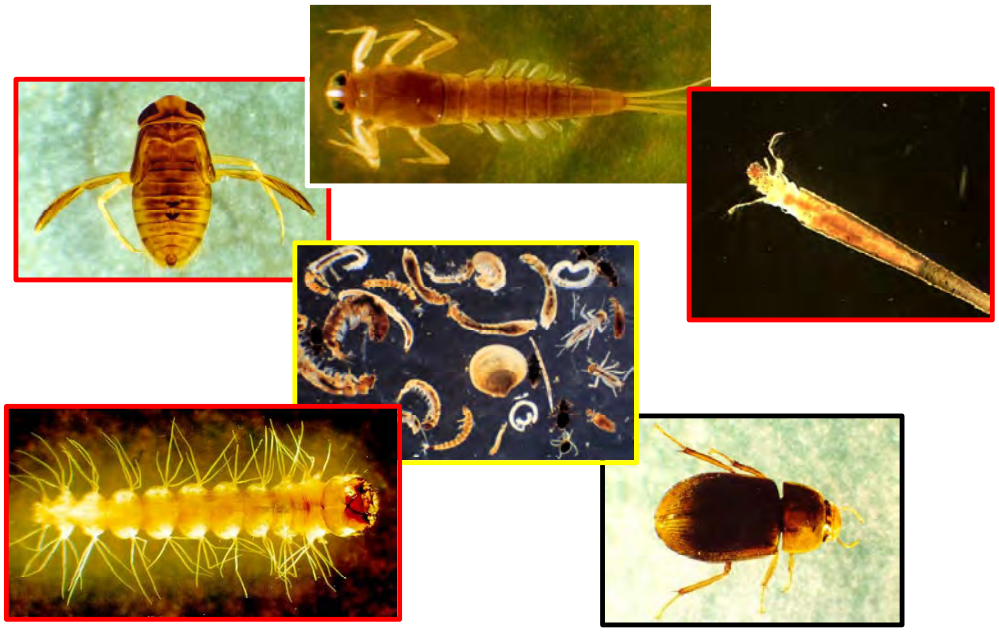
Biodiversity – macrophytic vegetation

Biodiversity – vertebrate species



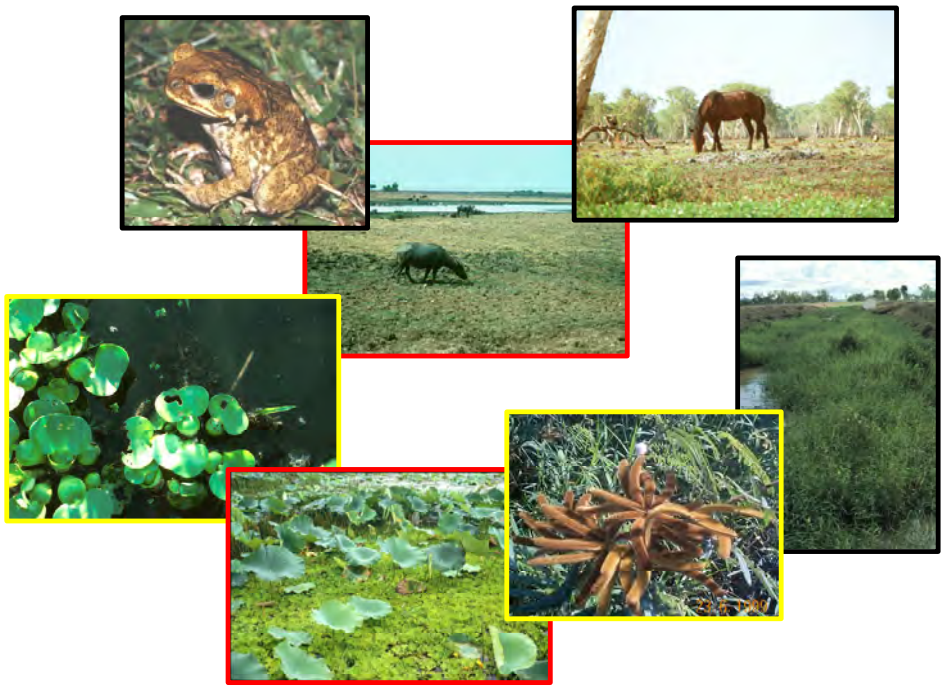
Biodiversity – vertebrate species

Biodiversity – invertebrate species

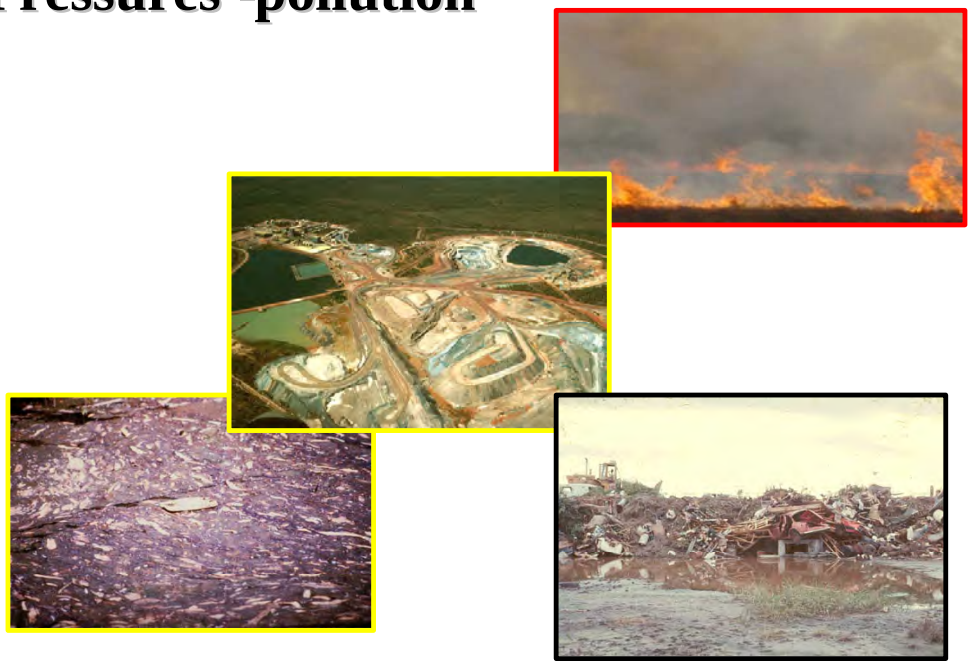


Value - uses

Pressures – invasive species



Pressures -pollution



Pressures – hydrological change / irrigation

Pressures – climate change

Future – management / governance

- Lack of information
- Multi-sectoral & fragmented / historical influences / narrow view of development
- Social inequity / centralised power
- Narrow economic base / funding inequities
- Low population / large wetland expanse
- Institutional structures available
- Indigenous land ownership
- Local empowerment

Thank you