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Loss and degradation of Australian wetlands.

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Loss and Degradation of Australian Wetlands

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Loss and degradation of Australian wetlands

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Abstract

Until recent times wetland loss and degradation in Australia was undertaken with little real thought for the values and benefits that such habitats provided. Thus, drainage and pollution occurred alongside degradation caused by invasive species and alteration of the water regime that supported wetlands. Whilst community-wide attitudes towards wetlands have changed we still do not have a comprehensive picture of the extent and condition of wetlands at a national scale. Nor have we succeeded in quantifying their values.

The reasons for wetland loss and degradation have been identified and those of an ecological nature are relatively well known, if not always quantified. However, the non-ecological causes have received less attention and are possibly more critical if loss and degradation is to be stopped and even reversed.

Australia has provided great support for the Ramsar Wetland Convention, although unevenly across all major jurisdictions. The Convention has been a valuable vehicle for developing concepts and practical guidelines for wetland management and for promoting the wise use of all wetlands. The further development of the Convention could greatly assist Australian wetland management and provide a basis for Australian assistance for other countries that are facing continuing loss and degradation of their wetlands. The Convention has also provided a means for identifying 'flagship' sites and species for particular conservation effort.

Introduction

It is now generally accepted that wetland loss and degradation has continued unabated across Australia for much of the 20th Century. Tropical wetlands may not have fared as badly, but this statement, as with the former, is not based on a wealth of firm evidence (Storrs & Finlayson 1997). However, despite the absence of quantitative evidence we have tended to accept the above statements as "truisms".

The realisation that wetlands were being lost and degraded led to considerable effort Australia-wide towards the conservation and wise use of wetlands (McComb & Lake 1988; Finlayson & von Oertzen 1993; Jacobs & Brock 1993). This has occurred more as a consequence of a general change in environmental awareness and related political responses than as a consequence of any concerted wetland campaign. Thus, at a federal level we have seen the development of the Natural Heritage Trust that supports broadscale conservation efforts. This also led to the publication of the Commonwealth wetland policy

and hosting of the Ramsar Wetlands Convention meeting in 1996. Further, non-governmental groups have been actively involved in diverse wetland conservation campaigns with the scientific base of the WWF campaign of the mid-1980s (McComb & Lake 1988) leading to a greater emphasis being placed on advocacy and community-led initiatives in the late-1990s.

In developing wetland policies and mounting wetland campaigns Australians have demonstrated that they have not been isolated from the increased global awareness of wetlands and their values. However, we still face enormous challenges if we are to manage wetlands and conserve these in a manner that benefits not only their "Australian" owners and managers, but takes into account our global obligations and commitments, both ethical and legal. In doing this we have become more aware of the reasons and processes that have caused, and continue to cause, wetland loss and degradation. These reasons are outlined below.

Australian wetlands

Australia has a wealth of wetland types with high altitude bogs contrasting with inland lakes and marshes and coastal lagoons and estuaries (Finlayson & von Oertzen 1993; Jacobs & Brock 1993). However, the extent of wetlands and their distribution is only partly known, as has been pointed out by Spiers & Finlayson (1999) in a review of the Australian Directory of Important Wetlands (ANCA 1996). Unfortunately, the Directory does not provide a comprehensive inventory of Australian wetlands. It is incomplete with some states/territories not having supplied complete data sets and much of the data that is supplied is not complete or verified. There are also inconsistencies in classification and delineation of wetlands. Much greater accuracy in data collection and analyses is required before we can state with any degree of certainty the extent and condition of wetland across much of Australia.

The estimated area of wetland in Australia, based on data produced in the Directory (Phillips 1996) is given in Table 1. However, extrapolation from these data is not recommended, for the reasons given above.

Table 1 Total area of wetland listed by each state/territory in the Directory of Important Wetlands in Australia (Phillips 1996).

State/Territory	Area (ha)
Australian Capital Territory	670
New South Wales	2 171 740
Northern Territory	2 912 790
Queensland	11 453 560
South Australia	4 100 290
Tasmania	20 830

Victoria	395 100
Western Australia	2 056 250
External Territories	1 090 580
Total	**24 201 810**

Thus, the data presented in Table 1 should be used only as a relative indication of the extent of wetland in each state/territory. On this basis the Directory entries for Queensland cover a far greater area than the other states/territories partly because the Queensland data includes the Great Barrier Reef whereas some other states/territories have not supplied information on estuarine or marine wetlands.

Protocols for a national approach to wetland inventory have been drafted (Finlayson 1999). These were developed in concert with an international review of wetland inventory conducted on behalf of the Ramsar Wetland Convention (Finlayson & Spiers 1999) that established standardised procedures and identified a core data set for further inventory. Information collated and presented in such a manner would provide a valuable resource for management and planning purposes and also provide a base for satisfying national obligations under the Ramsar Convention on Wetlands. The protocols have been developed further and form the basis of an Asian Wetland Inventory project that is being developed by the international non-governmental group Wetlands International with support from the Environment Agency of Japan.

Legislative base

Wetlands in Australia are not generally afforded any particular legislative protection other than directed at land/water and biological resources in a generic sense. Further, much of this protection is handled by the state/territory governments with the federal government mainly focussing on particular issues through national programs or issues of particular national relevance. The latter could include issues related to environmental impact assessment, international treaty obligations and/or external relations and trade. On the whole, however, wetland conservation, degradation and restoration issues are the preserves of the provincial authorities in concert with local government and landholders.

The federal wetland policy provides a framework for cooperation with the states/territories and outlines priority issues and directions, many being based on national obligations under the Ramsar Wetlands Convention. However, this policy does not have a legislative base. Further, only a few states/territories have finalised their own wetland policies. Jensen (1999) reports that "Protection, maintenance and management of wetlands as a key habitat in Australian is currently inconsistent on the broad scale."

The introduction of the federal Environment Protection and Biodiversity Conservation Act 1999 has provided a situation where important wetlands listed under the Ramsar Wetlands Convention, for example, could provide a trigger for intervention in line with the national obligations under the Convention. However, the actual implementation and working of this legislation is not yet finalised.

The Ramsar Convention has assumed some significance in Australia over the past decade, but it is on the whole not supported by specific enacting legislation. The states/territories are responsible for implementing the Convention within their jurisdictions with the federal environment agency, Environment Australia, providing the official contact point with the Bureau and other instruments of the Convention. The development of national input to the triennial meetings of the Convention is undertaken through a series of informal and formal processes that have in recent years encompassed non-governmental environmental groups, but not generally specialist technical organisations.

Wetland values and benefits

Whilst wetlands have received more and more protection and even restoration throughout Australia the values and benefits that they provide are still poorly known. These often go unrecognised until they are degraded or lost. International initiatives have resulted in such values being elaborated (Table 2), but only rarely is the worth of these values articulated. The latter occurs because we still do not fully understand the inter-relationships between the land and water that supports much of our economic and spiritual well being.

Table 2 Descriptions of wetland values and benefits under the broad headings of functions, products and attributes.

Functions *that result from the interactions between the biological, chemical and physical components of a wetland include*: water storage; storm protection; flood mitigation; shoreline stabilisation; erosion control; groundwater recharge/discharge; nutrient retention; sedimentation; pollutants; and stabilisation of local climatic conditions (especially rainfall and temperature).
Products *generated by interactions between the biological, chemical and physical components of a wetland include resources such as*: wildlife; fish; forests; forage; water; crops and edible plants.
Attributes *have value because they either induce a certain use or have intrinsic value, and include:* biological diversity; geomorphic features; and unique cultural and heritage features.

Across Australia it is widely assumed that the loss of many values and benefits relates directly to the areal loss of wetlands (Bunn et al. 1997; Jacobs & Brock 1993; Finlayson & von Oertzen 1993). However, it is difficult to test this assumption without a comprehensive wetland inventory. Together with monitoring, this would enable the tangible and intangible values and benefits derived from wetlands to be evaluated.

The extent of wetland loss and degradation

Some estimate place the loss of Australian wetlands as more than 50% of those that existed some 200 years ago. These estimates have been based on the following statistics:

- Swan Coastal Plain, Western Australia - 70% filled or drained (Halse 1988)
- Coastal region, New South Wales - 75% lost (Goodrick 1970)

- South-east, South Australia - 89% drained (Jones 1978)
- State of Victoria - 33% lost (CNR 1995)
- River Murray, south eastern Australia - 35% of seasonally inundated wetlands now permanently filled (Pressey 1986)

These figures provide a guide to the extent of degradation. However, the basis upon which they were calculated need assessing before further extrapolation. Whilst the basis for the asserted 50% loss is not strong the picture is decidedly gloomy and it is recognised that the known threats have not abated (Bunn et al. 1997, Finlayson et al. 1997). Vast tracts of wetlands in northern and central Australia continue to be degraded by introduced ungulates (cattle, horses) and feral animals (Finlayson et al. 1998; Storrs & Finlayson 1997). Forecasts are that the extent of loss and degradation will be exacerbated with global climate change and sea level rise (Bayliss et al. 1998).

Ecological causes of wetland loss and degradation

The ecological causes of wetland loss and degradation have been well espoused. McComb & Lake (1988) listed these (Table 3). Further Bunn et al. (1997) in a review of wetlands research and development priorities listed these under four broad headings: water regime; habitat modification; eutrophication and other pollutants; and invasion by exotic species. Others have added harvesting and over-exploitation.

Table 3 Threats to wetland in Australia (adapted from McComb and Lake 1988).

Direct threats
• Drainage of wetlands for agriculture, horticulture and forestry
• Reclamation or modification of wetlands for other commercial developments
• Extraction of groundwater and draw-down of water levels
• Abstraction and diversion of water from wetlands
• Inundation of wetlands to provide water storage
• Construction of barrages and diversion of water for flood mitigation
• Regulation of rivers through channel construction, walling of banks and desnagging
• Surface mining in wetlands
• use of wetlands as evaporation basins for highly saline irrigation water
• landscaping of wetlands in urban areas
• weed invasion
• application of chemicals and drainage for insect control
• grazing by and watering of stock in wetlands

• inappropriate recreational activities • wildfires • invasion by pathogenic organisms
Indirect threats
• nutrient enrichment following the clearing of catchments • salinisation • erosion, flooding and inundation following clearing of catchments • diversion of water from rivers causing siltation • discharge of industrial effluents and petroleum products • lack of co-ordinated planning policies at a catchment scale • lack of recognition of wetlands as linked interdependent systems

Identification of the major threats and issues that adversely affect wetlands has still not allowed the extent of loss and degradation to be adequately quantified.

Non-ecological causes of wetland loss and degradation

In addition to the ecological causes of wetland loss and degradation Finlayson and Rea (1999) have identified a suite of non-ecological reasons. Their analysis was based on Australian case studies, but prompted by analyses undertaken in the Mediterranean region. In discussing the loss and degradation of Mediterranean wetlands Hollis (1992) made the following telling comments:

"This loss and degradation is rooted in social, economic and political processes. These operate behind a chimera created by the immediate causes of wetland loss whilst the apparent causes of wetland loss, such as the often quoted agricultural intensification and tourism, etc., are merely the outward expression of the underlying factors."

"There has to be an offensive on the social, economic and political causes of wetland loss and degradation ....."

Some of the many underlying causes of wetland loss and degradation include: population pressure; lack of public and political awareness of wetland values; lack of political will for wetland conservation and restoration; over-centralised planning procedures; financial policies and irregularities; historical legacies of land use and tenure; weak and poorly resourced conservation institutions; sectoral organisation of decision making; deficiencies in the application of environmental impact and cost-benefit analysis; the passing of good legislation without subsequent enforcement; lack of trained personnel; limited international pressure; and alliances which promote policies and studies rather than action.

The Australian case studies demonstrate that these comments and causes are as relevant in Australia as they are in the Mediterranean. The extent to which these causes formally operate in Australia has not been assessed or openly discussed. Indeed, assessment that proves controversial may be another factor that prevents effective wetland management.

The Ramsar Wetland Convention

Given that land and water management in Australia is largely the prerogative of the state/territory governments there have been few truly national wetland management programs. Generalised reviews have occurred and major problems identified, but few concerted efforts have occurred across the jurisdictional borders that divide Australia. The above mentioned national wetland directory illustrates the different emphases that have characterised and fragmented our national wetland effort.

This has also been shown by the uneven implementation and utilisation of the Ramsar Wetlands Convention. Australia was the first country to sign the Convention in 1974 and has subsequently nominated ?? sites as being of international importance. The Australian federal government also hosted the 6th Meeting of the Conference of the Parties to the Convention in 1996. In addition to the many international initiatives raised during this meeting the Australian government used this as an opportunity to launch a multi-national migratory waterbird program and a tropical wetland managers training program. Australia has provided support for the Convention's Scientific and Technical Review Panel which has played an increasingly important role in recent years in translating policy statements into technical guidelines and vice versa.

Recent initiatives that have been developed under the Convention include the provision of guidelines for the wise use of wetlands. These have branched out into technical consideration of protocols for wetland inventory, monitoring and risk assessment, as well as steps to enhance the involvement of local communities and indigenous people in wetland management. In these respects it has placed itself at the forefront of international environmental issues and is playing an increasing role in global consideration of water management, biodiversity and climate change analyses. By taking these directions the Convention is potentially providing a challenge for member parties to follow suit. Our success in meeting these challenges in Australia can be measured by the proliferation of state/territory policies that mirror many of the concepts promulgated by the Convention. Our real success, however, will be shown by the level of maturity with which we address the steps necessary to stop and reverse the loss and degradation of wetlands.

References

ANCA 1996. A directory of important wetlands in Australia, second edition. Australian Nature Conservation Agency, Canberra.

Bayliss BL, Brennan KG, Eliot I, Finlayson CM, Hall RN, House T, Pidgeon RWJ, Walden D & Waterman P 1998. Vulnerability assessment of predicted climate change and sea level rise in the Alligator Rivers Region, Northern Territory, Australia. Supervising Scientist Report 123, Supervising Scientist Group, Jabiru, Australia.

Bunn SE, Boon PI, Brock MA & Schofield NJ 1997. National wetlands R&D program: scoping review. Land and Water Resources Research and Development Corporation, Canberra.

CNR 1995. Wetland Database. Flora and Fauna Branch, Department of Conservation & Natural Resources, Heidelberg.

Finlayson CM 1999. Protocols for an Australian national wetland inventory. In CM Finlayson & AG Spiers (eds), Techniques for Enhanced Wetland Inventory, Assessment and Monitoring. Supervising Scientist Report 147, Supervising Scientist Group, Canberra. 119-145.

Finlayson CM & Rea N 1999. Reasons for the loss and degradation of Australian wetlands. Wetland Ecology and Management 7, 1-11.

Finlayson CM & Spiers AG 1999. Global Review of Wetland Resources and Priorities for Inventory. Supervising Scientist Report 144, Canberra.

Finlayson CM & von Oertzen I 1993. Wetlands of Northern (tropical) Australia. In Wetlands of the world 1: Inventory, ecology and management, eds DF Whigham, D Dykjova & S Hejny, Handbook of Vegetation Science 15/2, Kluwer Academic Publishers, Dordrecht, The Netherlands, 195-243 and 286-304.

Finlayson CM, Hall RN & Bayliss BL 1997. Regional review of wetland management issues: Wet-dry tropics of northern Australia. LWRRDC Occasional Paper 03/97, Canberra. 35 pp.

Finlayson CM, Bailey BJ, Freeland WJ & Fleming M 1988. Wetlands of the Northern Territory. In AJ McComb & PS Lake (eds) The Conservation of Australian Wetlands, Surrey Beatty & Sons, Sydney. pp 103-126.

Goodrick GN 1970. A survey of wetlands of coastal New South Wales. CSIRO Division of Wildlife Research Technical Memorandum No 5, Canberra.

Halse SA 1988. Wetlands of the Swan Coastal Plain – past and present. Swan Coastal Plains Groundwater Management Conference, Western Australian Water Research Council, Perth, Australia.

Hollis GE 1992. The causes of wetland loss and degradation in the Mediterranean. In Mananaging Mediterranean wetlands and their birds, Finlayson CM, Hollis GE & Davis TD (eds), IWRB Special Publication 20: 83-92. Slimbridge, UK.

Jacobs SWL & Brock MA 1993. Wetlands of southern Australia. In Wetlands of the world I: inventory, ecology and monitoring, eds DF Whigham, D Dykjova & S Hejny, Handbook of Vegetation Science 15/2, Kluwer Academic Publishers, 244-304.

Jensen A 1998. Australian wetland policies, research and management. In Wetlands in Dry Land: Understanding for Management, Environment Australia, Biodiversity Group, Australia, 19-32.

Jones W 1978. The wetlands of the south-east of South Australia. Nature Conservation

Netherlands.

McComb AJ & Lake PS (Eds) 1988. The conservation of Australian wetlands, Surrey Beatty and Sons, Sydney.

Phillips B 1996. Introduction. In A directory of Wetlands in Australia (2nd edition), Australian Nature Conservation Agency, Canberra, 1-6.

Pressey RL 1986. Wetlands of the River Murray below Lake Hume. River Murray

Spiers AG & Finlayson CM 1999. An assessment of the extent of wetland inventory data held in Australia. In CM Finlayson & AG Spiers (eds), Techniques for Enhanced Wetland Inventory, Assessment and Monitoring. Supervising Scientist Report 147, Canberra. 1-43.

Storrs MJ & Finlayson CM 1997. Overview of the conservation status of wetlands of the Northern Territory. Supervising Scientist Report 116, Supervising Scientist Group, Jabiru, Australia.

WETLAND LOSS & DEGRADATION IN AUSTRALIA

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WETLAND LOSS & DEGRADATION IN AUSTRALIA

The wetland scene

The wetlands

The legislation

Loss and Degradation

Ecological causes

Non-ecological causes

The Ramsar Wetlands Convention

WETLAND LOSS & DEGRADATION IN AUSTRALIA

The wetland scene - generalised

- Loss and degradation has continued for most of 20th Century
- Tropical wetlands have suffered less
- An absence of quantitative data
- Greater change in environmental awareness across the community

WETLAND LOSS & DEGRADATION IN AUSTRALIA

The wetland scene - generalised

- Natural Heritage Trust funding
- Commonwealth wetland policy
- Hosted 1996 Ramsar Convention meeting
- NGO science-based, advocacy and community-led wetland campaigns
- National and international obligations to conserve wetlands

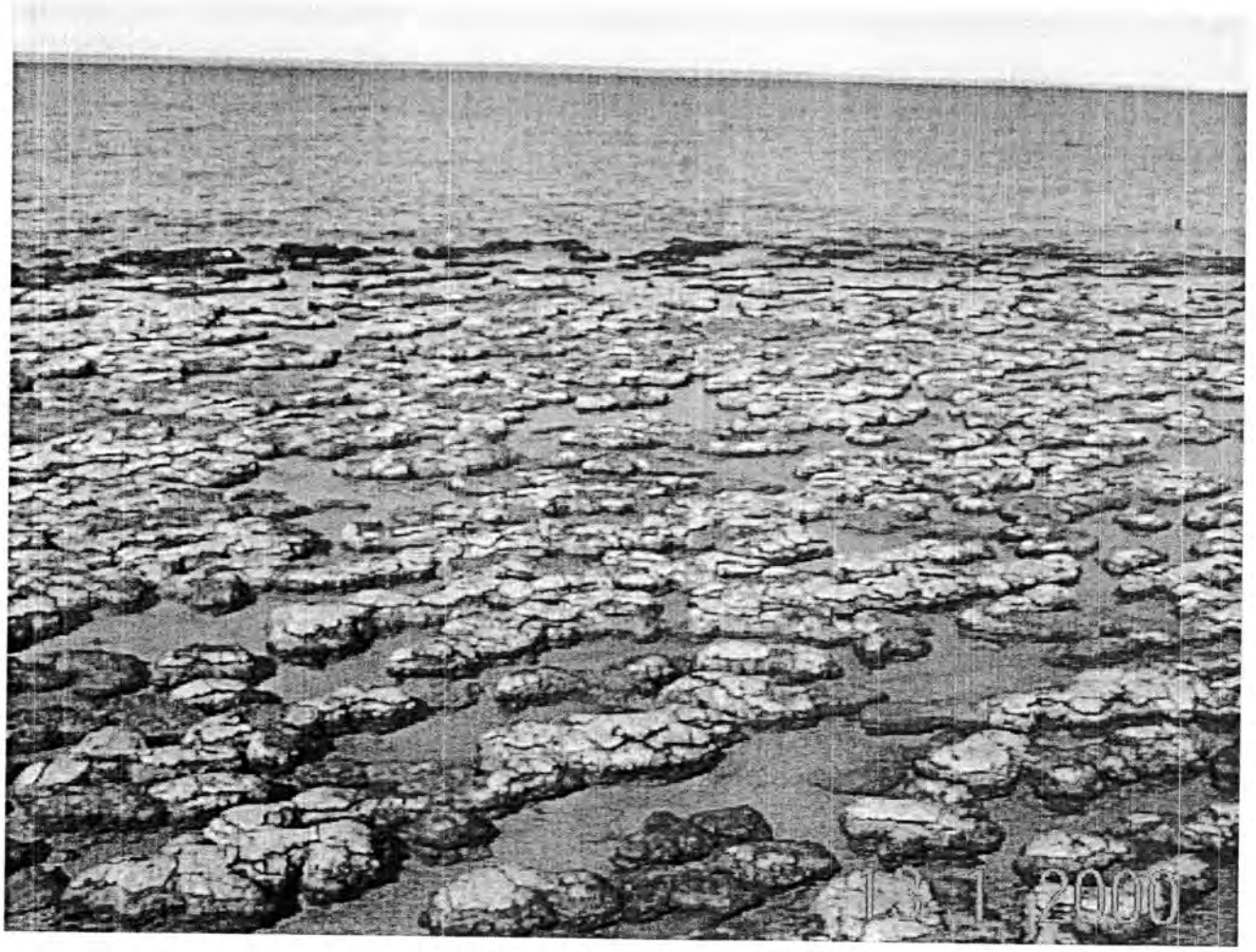
WETLAND LOSS & DEGRADATION IN AUSTRALIA

Australian wetlands

- Wealth of wetland types - bogs, marshes, swamps, lakes, lagoons, estuaries, reefs
- Extent of wetlands is poorly known
- National wetland directory is incomplete, inconsistent, not-verified

WETLAND LOSS & DEGRADATION IN AUSTRALIA

WETLAND LOSS & DEGRADATION IN AUSTRALIA



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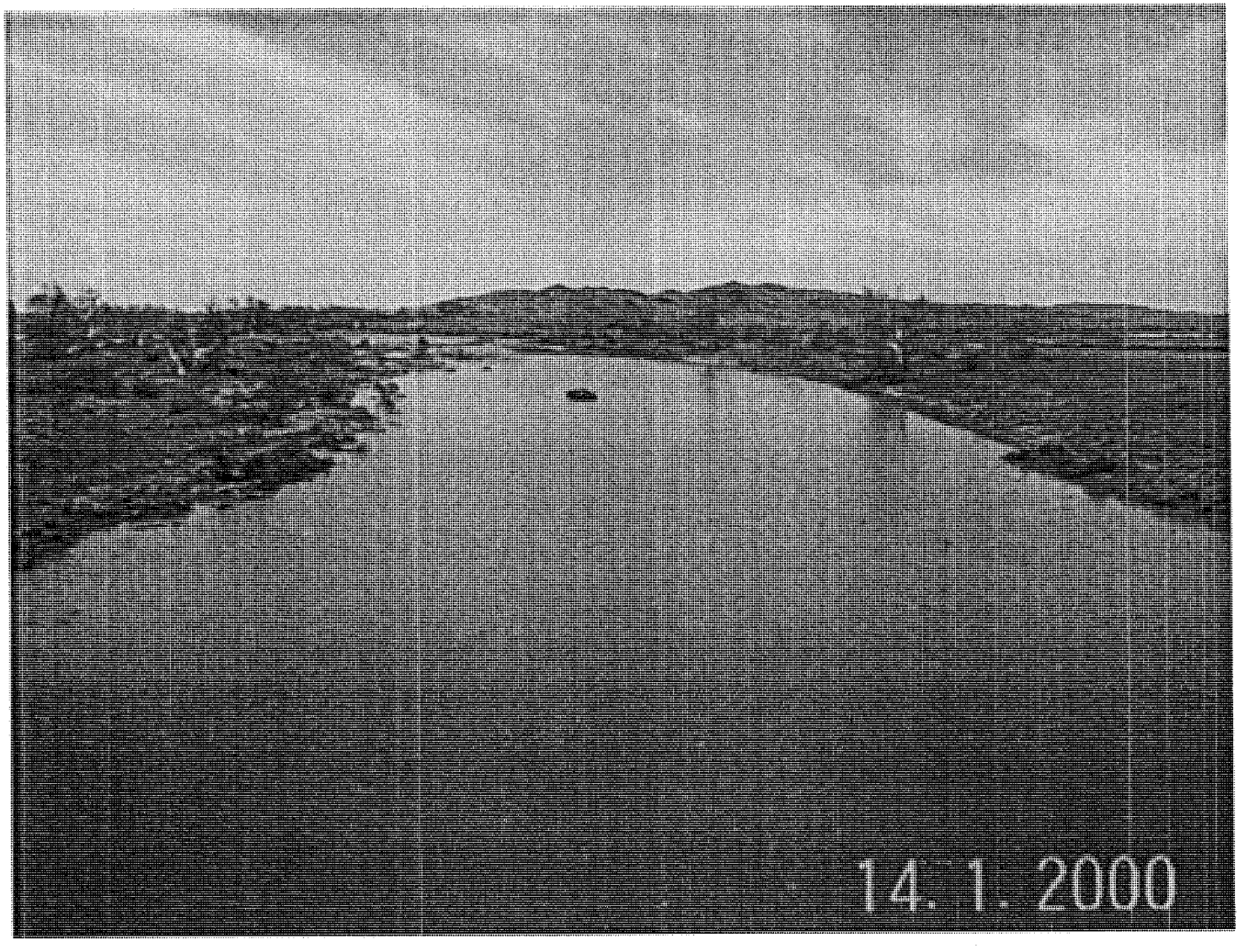

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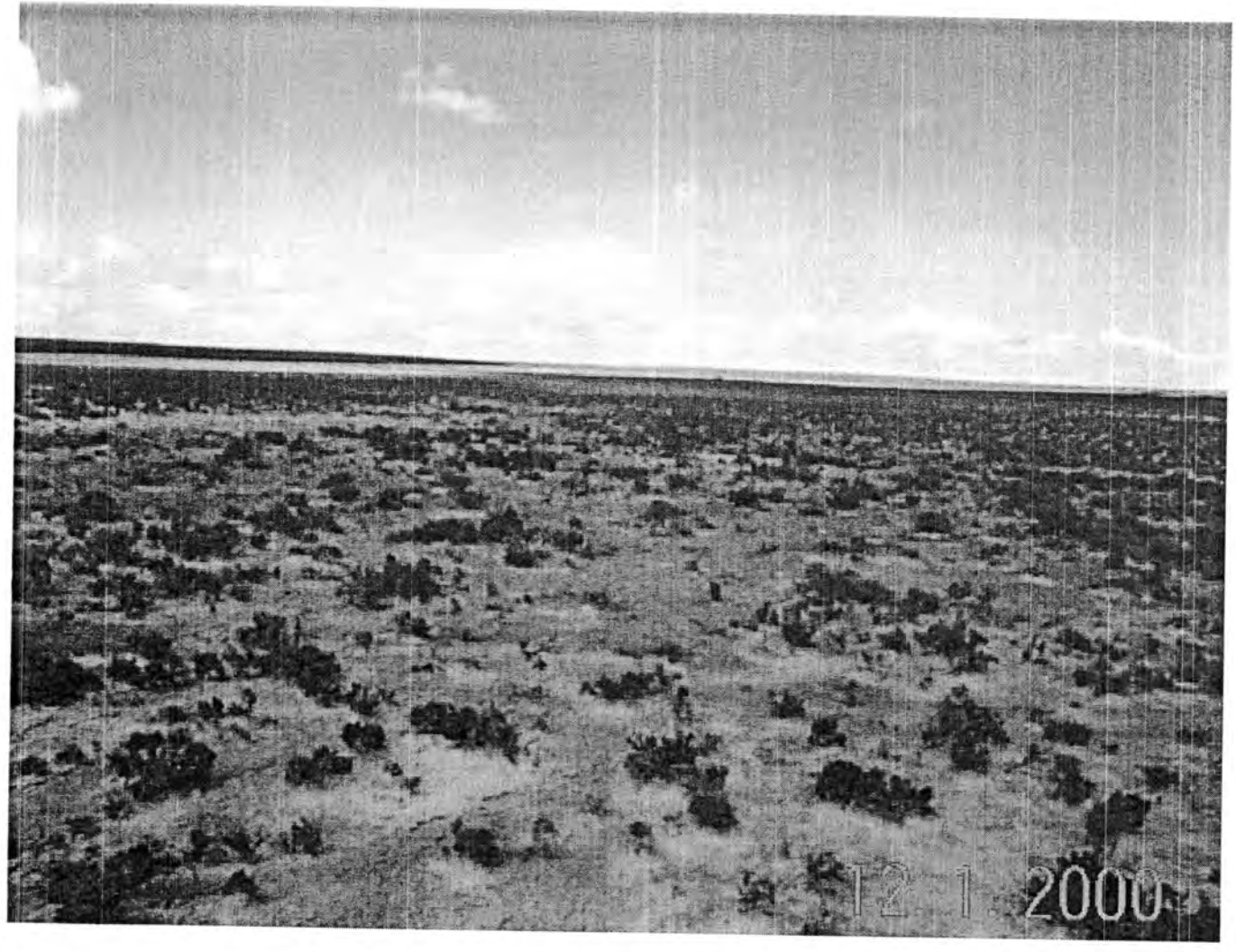


WETLAND LOSS & DEGRADATION IN AUSTRALIA

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Australian wetlands

- Total area - not known, values exist but not accurate nor verified, extrapolation from figures is not advisable
- National directory has area listing of 24, 201, 810 ha (242,018 km^2)

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Australian wetlands

- No consistent national inventory
- Protocols for national inventory drafted in 1998, based on international concepts
- Protocols established standardised procedures and core (minimum) data set
- Protocols used for an Asian Wetland Inventory supported by Japanese agency

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Legislative base

- Generally no specific legislation
- State/territory role for land/water
- Federal focus on specific programs or issues of national significance
- Federal wetland policy framework
- Few states/territories yet have parallel policy framework

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Legislative base

- "Protection, maintenance and management of wetlands as a key habitat in Australia is currently inconsistent on a broad scale." (Jensen 1999)
- Fed Environment Protection & Biodiversity Conservation Act 1999 (EPBC) will lead to triggers for intervention at Ramsar sites based on protocols and Ministerial discretion

WETLAND LOSS & DEGRADATION IN AUSTRALIA

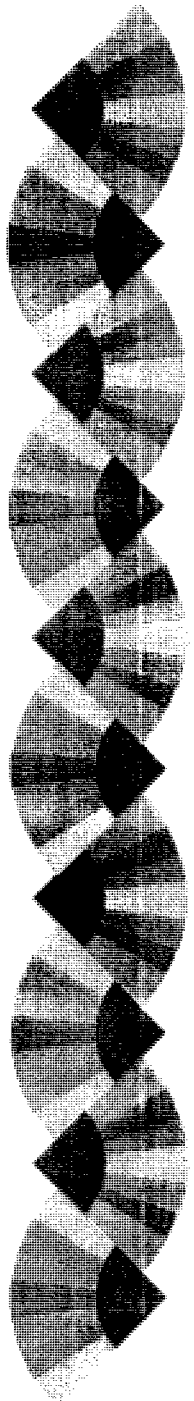
Legislative base

- No legal support for Ramsar Convention except for EPBC Act 1999
- Decisions taken under Ramsar are not legally binding - e.g. record of sites that undergo adverse change, monitoring, wise use, etc
- National policy development occurs through formal & informal consultation
- NGOs and science societies play major informal role

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Wetland values and benefits

- Values and benefits of wetlands often not recognised until they have been lost
- Loss of wetland area very unlikely to equate directly with loss of values and benefits
- Inventory and monitoring programs needed to establish area, values & benefits and priorities



WETLAND LOSS & DEGRADATION IN AUSTRALIA

Wetland values and benefits

- Include wetland functions, products and attributes
- Many have not been quantified and many are intangible
- Major efforts to quantify some values and benefits and place monetary price on these
- Restoration is unlikely to replace these, at least within reasonable cost restraints

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Wetland values and benefits

- Wetland functions - result from the interactions between the biological, physical and chemical components of a wetland
- Wetland functions include - flood mitigation; shoreline stabilisation; erosion control; groundwater regulation; nutrient, sediment and pollutant retention; stabilisation of local climate

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Wetland values and benefits

- Wetland products - generated by interactions between the biological, physical and chemical components of a wetland - 'things that are harvested'
- Wetland products include - wildlife; fish; forests; forage; water; crops and edible plants

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Wetland values and benefits

- Wetland attributes - have value because they either induce a certain use or have intrinsic value - 'feel good'
- Wetland attributes include - biological diversity; geomorphic features; uniques cultural and heritage features

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Extent of wetland loss & degradation

- Unreliable estimates of 50% national loss
- Swan Coastal Plain - 70% filled/drained - 1988
- Coastal NSW - 75% lost - 1970
- South east SA - 90% drained - 1978
- Victoria - 33% lost - 1995
- River Murray, SE Aust - 35% seasonal wetlands infilled - 1986

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Extent of wetland loss & degradation

- Degradation could exceed extent of loss, but few reliable analyses beyond specific sites
- Many wetlands degraded by invasive species, rubbish, contamination, hydrological change, grazing, harvesting, burning, beautification
- Local problems will be exacerbated by global scale change - sea level rise, flooding, drying, seasonality

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Ecological causes of loss/degradation

- Changes to the water regime (physical)
- Habitat modification (physical)
- Eutrophication and pollution (chemical)
- Invasion by exotic species (biological)
- Harvesting and over-exploitation (biological)

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Ecological causes of loss/degradation

- Drainage for agriculture, horticulture and forestry
- Reclamation or modification for urban or industrial development
- Extraction of groundwater for irrigation, stock and domestic use
- Abstraction and diversion of water from wetlands
- Construction of barrages and flood mitigation
- Flooding for water storage

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Ecological causes of loss/degradation

- Use of wetlands as evaporation basins for saline water
- River regulation through channelisation, desnagging
- Weed and feral animal invasion
- Application of chemicals and drainage for insect control
- Grazing by and watering of stock in wetlands
- Wildfires and changed fire regimes
- Recreational activities and urban/tourism landscaping
- Surface mining in wetlands

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Non-ecological causes

- ***"This loss and degradation is rooted in social, economic and political processes."*** *(Hollis 1992 - Mediterranean wetland program)*

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Non-ecological causes

- population pressure
- lack of public and political awareness of wetland values
- lack of political will for wetland conservation and restoration
- over-centralised planning procedures
- financial policies and irregularities
- historical legacies of land use and tenure
- weak and poorly resourced conservation institutions

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Non-ecological causes

- sectoral organisation of decision making
- deficiencies in the application of environmental impact and cost-benefit analysis
- the passing of good legislation without subsequent enforcement
- lack of trained personnel
- limited international pressure
- alliances which promote policies and studies rather than action

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Non-ecological causes

- Australian case studies (Finlayson & Rea 1999) demonstrate that these comments and causes are as relevant in Australia as in the Mediterranean.
- The extent or importance of each cause has not been assessed in Australia
- Assessments that threaten vested interests within an economic development mind-set may not be undertaken

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Non-ecological causes

- ***"There has to be an offensive on the social, economic and political causes of wetland loss and degradation ....."***
  (Hollis 1992 - Mediterranean wetland program)

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Non-ecological causes

- Legislation to stop and reverse wetland loss and degradation needs to consider both the ecological and non-ecological causes
- Addressing only the ecological causes will not stop and reverse wetland loss and degradation

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Ramsar Wetlands Convention

- Australia first Contracting Party - 1974
- Convention came into effect - 1975
- Currently 120 parties with 1025 sites covering 78,176,211 ha listed as internationally important
- Australia has listed 53 sites covering 5,249,179 ha

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Ramsar Wetlands Convention - Obligations

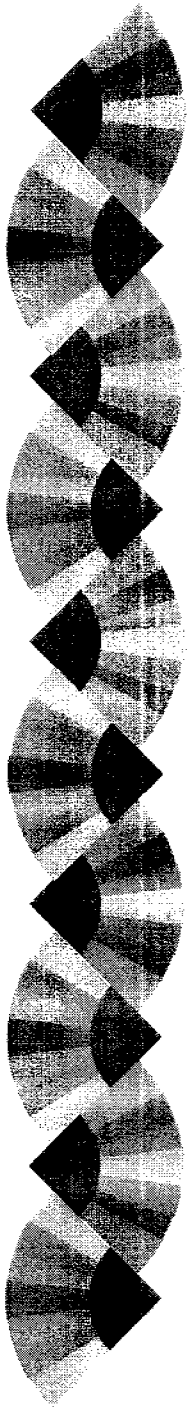
- List at least one site as internationally important, using agreed criteria
- Promote wise use of all wetlands
- Promote international cooperation, particularly with shared wetlands and wetland species

WETLAND LOSS & DEGRADATION IN AUSTRALIA

Ramsar Wetlands Convention - Decisions

Guidelines and guidance for

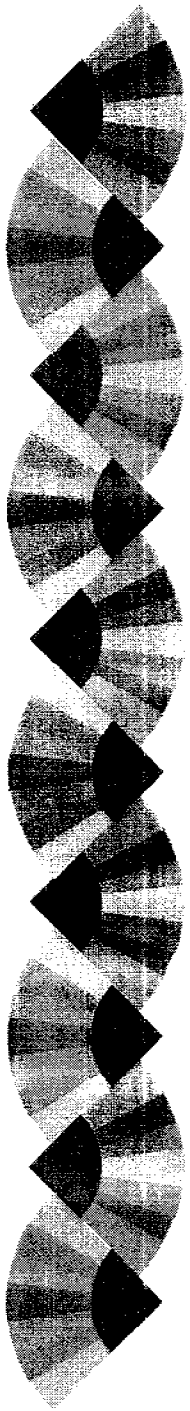
- wise use & shared river basins
- international cooperation
- local community involvement
- education & awareness
- management planning
- inventory, assessment & monitoring



WETLAND LOSS & DEGRADATION IN AUSTRALIA

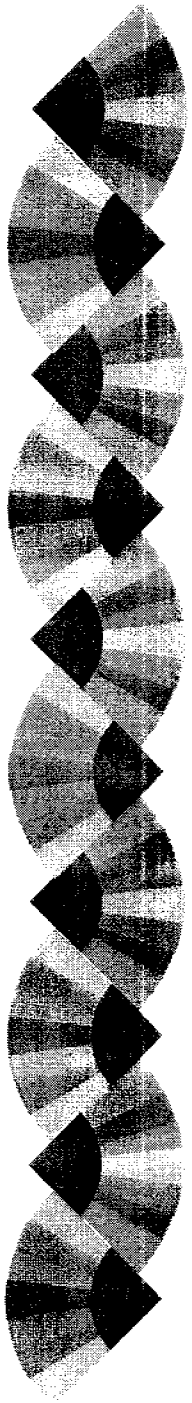
Ramsar Wetlands Convention

- Decisions provide a challenge for Contracting Parties to enact these - assessed triennially
- Acceptance and implementation across Australia has been uneven and disjointed
- Success of the Convention will be shown by our reactions and success in stopping and reversing the loss and degradation of Australian wetlands



WETLAND LOSS & DEGRADATION IN AUSTRALIA

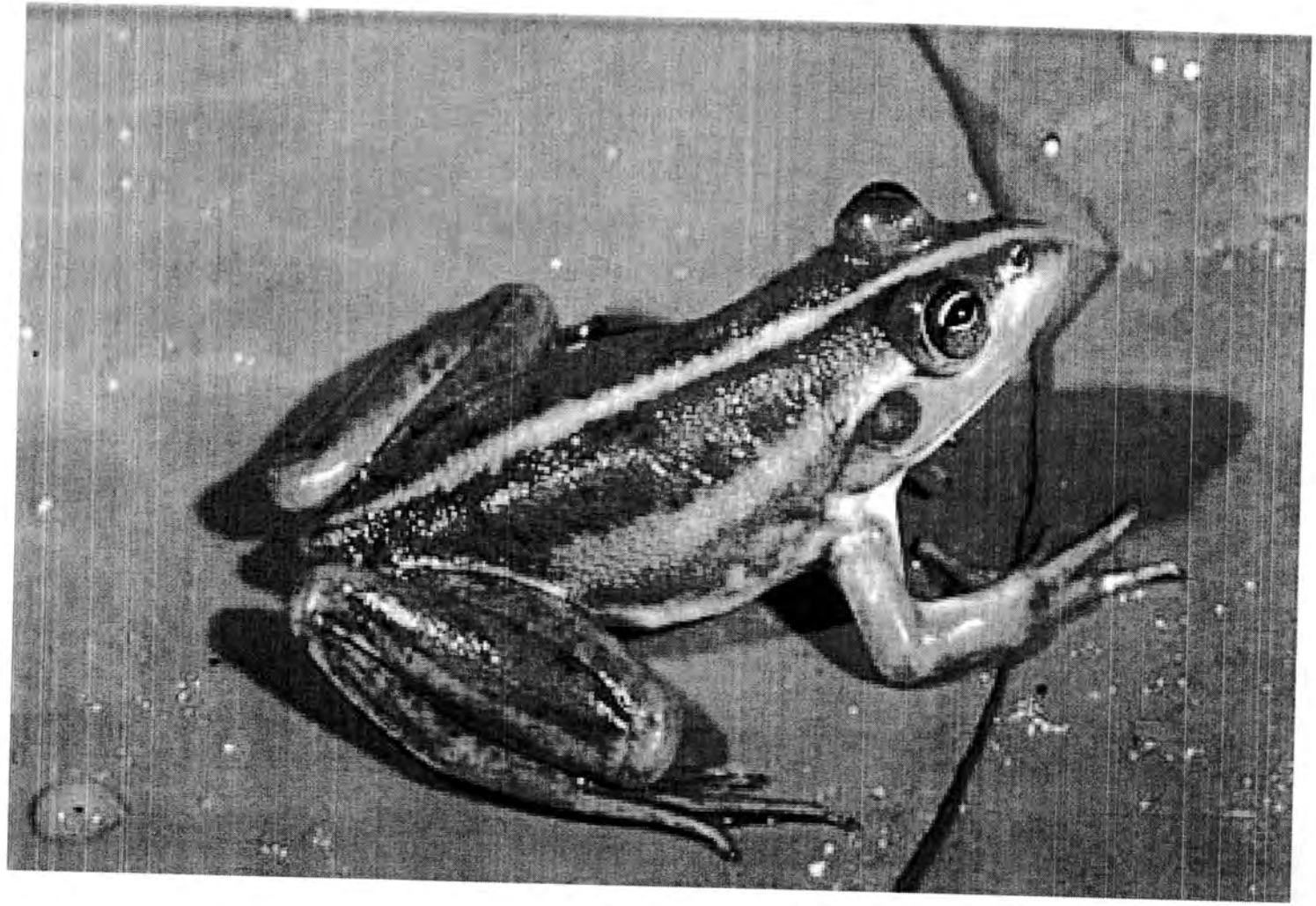
- Wetland loss and degradation has been extensive and continues
- Wetland values & benefits not well recognised, nor seen in monetary terms
- Wetland conservation not supported by sufficient information and knowledge base
- Non-ecological obstacles limit our effectiveness
- Legislative/administrative tools need to consider these obstacles



WETLAND LOSS & DEGRADATION IN AUSTRALIA

- Ramsar Wetlands Convention could be used more effectively to stop and reverse wetland loss and degradation
- Specific enabling legislation for the Convention could be used to support the wise use of all wetlands
- However, this would probably require a major shift in sectoral thinking and processes - that is our challenge

WETLAND LOSS & DEGRADATION IN AUSTRALIA



WETLAND LOSS & DEGRADATION IN AUSTRALIA

LAWASIA Conference

Environmental Law Issues in the Asia-Pacific Region

16 — 19 May 2000
Northern Territory, AUSTRALIA
Optional Field Trip — Kakadu National Park
16 — 17 May 2000

Of interest to:

- *members of judiciary*
- *lawmakers*
- *practitioners*
- *government bodies*
- *mining industry*
- *corporations*
- *environmental groups*

Optional Kakadu National Park field trip includes:

- *Yellow Water Wetlands*
- *Ranger Uranium Mine*
- *Bowali Visitors' Centre*

Environmental Law Issues in the Asia-Pacific Region aims to provide a training program for members of the judiciary, lawmakers and practitioners of the region in scientific and policy issues surrounding environmental law matters. The conference program will be an intensive package delivering a sound overview of environmental issues, with particular emphasis on scientific and policy backgrounds.

Sessions on air pollution, water pollution, land degradation, biological diversity and the role of law and lawyers will be complemented by key-note speakers from a range of legal and scientific backgrounds. Speakers whose expertise in these areas has given them an international reputation will provide the content of each session and will ensure that the conference offers a comprehensive and thorough program of the highest quality.

This LAWASIA conference is an opportunity to acquire some valuable background to an area of law that is already important and growing in importance. For interstate and international visitors, it offers the chance to visit the Northern Territory in the context of examining some of the major issues affecting it. Environmental issues such as the mining of uranium in the Kakadu National Park area, the preservation of indigenous lifestyles and values and the conservation of the unique geographical features of the NT are of great importance both locally and regionally. It is fitting that the location of this conference delivers to participants a chance to consider these and related issues in this setting.

Registration and Enquiries to LAWASIA Secretariat
GPO Box 3275, Darwin 0801 NT, AUSTRALIA
Tel: +61 8 8946 9500 Fax: +61 8 8946 9505E-mail: lawasia@lawasia.asn.au

0630 YW breakfast.

PROGRAMME

Wednesday 17 May 2000

2.00-6.00pm **REGISTRATION** - Saville Park Suites

6.00pm **WELCOME RECEPTION** - Parliament House. Hosted by the Chief Minister of the Northern Territory, The Hon Mr Denis Burke, MLA

Thursday 18 May 2000

Conference venue: Supreme Court, Court 1

8.30am **OFFICIAL OPENING**

9.15am **KEYNOTE ADDRESS** - *The Role of Law in the Protection of the Environment in the Asia-Pacific Region.* **The Hon. Hilario G. Davide, Jnr,** Chief Justice Supreme Court of the Philippines

10.00am Morning Tea - *Jury Muster Room*

Topic 1: Air Pollution

10.30am *Air pollution issues in the Asia-Pacific region.* **Dr Peter Manins**, leader, Air Pollution Program; Manager, Environmental Consulting & Research Unit, Atmospheric Research, CSIRO Australia

11.15am *Global atmospheric issues: Ozone depletion and Climate change – causes & consequences.* **Dr Chris Mitchell**, Atmospheric Research, CSIRO, Australia

12.00pm *Policy and legal responses to air pollution.* **Assoc. Prof. Lye Lin Heng**, Deputy Director, Asia-Pacific Centre for Environmental Law, National University of Singapore; Singapore

12.45pm Discussion

1.00pm Lunch - *4th Floor Balcony*

Topic 2: Water Pollution

2.00pm *Freshwater pollution: types of pollutants, causes & consequences.* **Mr Antonio Oposa**, Counsellor at Environmental Law, A. Oposa and Associates, Philippines

2.45pm *Legal responses to water pollution problems.* **.Prof.Wang Xi**, Vice Director, Research Institute of Environmental Law, Wuhan University, PRC

3.30pm Afternoon Tea - *Jury Muster Room*

4.00pm Water Pollution Workshop: **Prof Wang Xi**

4.30pm Discussion

5.00pm Special Judges' Forum. Venue to be advised.

8.00pm **OFFICIAL CONFERENCE DINNER** – The Esplanade

Friday 19 May 2000

Topic 3: Land Degradation

8.30am *Land degradation in the Asia-Pacific region: Extent, causes and consequences.* **Dr Ian Hannam**, Manager, Land Vegetation (Compliance), Dept of Land &Water Conservation, Australia

9.15am *Case Study: Land and soil degradation in the Darwin-Kakadu area.* **Dr Garry Cook**, CSIRO Wildlife & Ecology, Australia

9.45am *Loss of Wetlands.* **Dr Max Finlayson**, Head, Wetlands Research Program, Environmental Research Institute of the Supervising Scientist, Australia

10.30am Morning Tea - *Jury Muster Room*

Topic 4: Biological Diversity

11.00am *Biological Diversity: Nature, importance and causes of loss.* **Mr Brian Preston S.C.**, Barrister, Selborne Chambers; Chair, LAWASIA Standing Committee of Environmental Law, and lecturer, University of Sydney.

11.45am *The black striped mussel invasion of three Darwin marinas - Who is responsible?* **Dr Rex Pyne**, Deputy Director (Fisheries), Dept. of Primary Industries & Fisheries, Australia

12.15pm *Policy and legal responses to loss of biological diversity.* **Prof. Neil Gunningham**, Australian Centre for Environmental Law, Australian National University

1.00pm Lunch - *4th Floor Balcony*

Topic 5: Role of Law and Lawyers

2.00pm *Interaction between regional/international systems and national legal systems.* **Prof. Ben Boer**, University of Sydney.

2.30pm *The role of judges in environmental law education in the Asia-Pacific region.* **Prof. Koh Kheng Lian**, Asia Pacific Centre for Environmental Law, Singapore

3.00pm Afternoon Tea - *Jury Muster Room*

3.30pm *Role of lawyers & judges in developing & implementing environmental law.* **Mr M C Mehta**, Advocate, Supreme Court of India

4.00pm Discussion/workshop

4.30pm **CLOSING REMARKS**

5.00pm Special Judges' Forum. Venue tba

Accommodation

LAWASIA is holding block bookings at the Saville Park Suites, Rydges Plaza Darwin and the Poinciana Inn and has negotiated special conference rates. Please direct all accommodation requests for these hotels to the LAWASIA Secretariat on the form provided.

Registrants are advised that Darwin has a limited number of hotels and rooms are not always freely available during the tourist season. It is therefore suggested that bookings & registration forms are sent as soon as possible. *(The room rates quoted below are per night & include 5% NTMD tax.)*

Saville Park Suites – 88 The Esplanade, Darwin
Tel: +61 8 8943 4333 Fax: +61 8 8943 4388

Rated four star, the hotel offers both hotel rooms and apartment-style accommodation. Located on The Esplanade overlooking Darwin Harbour and within strolling distance of the conference venue. Babysitting facilities available.

hotel room: AU$152.25 per night
suite: AU$178.50 per night

Rydges Plaza Darwin – 32 Mitchell Street, Darwin
Tel: +61 8 8982 0000 Fax: +61 8 8981 1765

Rydges Plaza Darwin is one of the city's premier hotels. A convenient CBD location just 20 minutes from the international airport. Babysitting facilities available.

hotel room: AU$131.25 per night

Poinciana Inn – cnr Mitchell & McLachlan Sts
Tel: +61 8 8981 8111 Fax: +61 8 8941 2440

Located in the heart of the city.

hotel room: AU$113.40 per night

Conference Venue

All conference sessions will be held in the Supreme Court of the Northern Territory, State Square Darwin which is a short walk from all recommended hotels.

Registrant Entitlements

Social Functions: Registrants are entitled to attend all social functions

Meals: The welcome reception, morning and afternoon teas, lunches and the official conference dinner are included in the cost of the registration fees. Breakfasts and evening meals are the responsibility of the delegate except where specified.

Conference Satchels: Registrants will receive a conference satchel containing a copy of available papers and other conference material.

Passports and Visas

Valid passports are required for entry to Australia and participants are advised to apply to their local Australian consular or diplomatic missions for visa information. Persons requiring letters of invitation are requested to contact the Secretariat.

Gagudju Crocodile Hotel, Jabiru

Kakadu National Park field trip participants will spend one night at the Gagudju Crocodile Hotel, Jabiru. Situated in the heart of the World Heritage listed Kakadu National Park, it is the only three and a half star hotel in Kakadu, known for its unique crocodile shape.

Registration Fees

Darwin sessions only: 17-19 May 2000

LAWASIA member	AU$920	US$600
Non-member	AU$1050	US$680
Discount member*	AU$460	US$300
Discount non-member*	AU$525	US$340

Kakadu Field Trip only: 16-17 May 2000

Optional Field Trip †	AU$500	US$325

Accompanying Persons: Contact the LAWASIA Secretariat

** discount applies to members of the profession admitted to practice for less than 5 years or members of the profession resident in Afghanistan, Bangladesh, Cambodia, Laos, Myanmar, Nepal, Pakistan, Sri Lanka and Vietnam.*

† includes 1 nights accommodation Gagudju Crocodile Hotel, Jabiru

Optional Kakadu National Park field trip

The Kakadu National Park field trip includes a BBQ dinner on Tuesday, breakfast and lunch on Wednesday, bus transport from Darwin for the duration of the tour, Kakadu National Park entry fee, Yellow Water Wetlands cruise and one night's accommodation at the Gagudju Crocodile Hotel, Jabiru. Numbers for the Kakadu option are limited, available on a first come first served basis.

Tuesday 16 May 2000

12.00pm Depart Darwin for Jabiru - participants will be picked up from the official conference hotels, airport pick up can be pre-arranged with Secretariat.

4.00pm *Arrive Gagudju Crocodile Hotel*

5.00pm *Depart Gagudju for Nourlangie Rock*

5.30pm *Visit to Nourlangie Rock followed by sunset BBQ*

Accommodation: Gagudju Crocodile Hotel, Jabiru

Wednesday 17 May 2000

6.45am Daybreak cruise: Yellow Water Wetlands with Dr Max Finlayson (breakfast included)

9.45am ERA Ranger Uranium Mine tour and talk

12.00pm Bowali Visitor Centre with talk from Kakadu National Park ranger. (lunch included)

1.30pm Return to Darwin for Welcome Reception

All field trip participants will be pre-registered for the main conference prior to departing Darwin.

Official International Carrier

Malaysia Airlines is proud and honoured to support the LAWASIA conference on Environmental Law Issues in the Asia-Pacific Region.

In 2000 Malaysia Airlines celebrates its tenth year of operation into Darwin. It is our pleasure to make our world-class airline service available to both residents of and visitors to Darwin and the Northern Territory.

Contact your local Malaysia Airlines office for more information on available flights and fares.

Pre and Post Conference Tours

AAT Kings Top End programs offer you a fantastic array of one, two and three day touring options including Litchfield national park, Katherine Gorge and the world famous Kakadu National Park. For bookings and enquiries please telephone +61 8 8941 3844.

For general tourist information contact the Darwin Regional Tourism Assn. GPO Box 4392, Darwin NT 0801 Australia
Tel: + 61 8 8981 4300 Fax: +61 8 8981 0653

Cancellation & Refunds

Cancellations and refunds may be made upon receipt of written notice, less handling fee and bank service charges as follows:

received until 16 April - 50% refund — received after 16 April - No refund

General Information

Registration and Enquiries to LAWASIA Secretariat
GPO Box 3275, Darwin 0801 NT, AUSTRALIA
Tel: +61 8 8946 9500 Fax: +61 8 8946 9505E-mail: lawasia@lawasia.asn.au

Environmental Law Issues in the Asia-Pacific Region

16-19 May 2000 Darwin & Kakadu, Northern Territory Australia

CONFERENCE REGISTRATION FORM

Please type or print in block letters and return this form to:

LAWASIA Secretariat, GPO Box 3275, Darwin NT 0801 AUSTRALIA
Tel: +61 8 8946 9500 Fax: +61 8 8946 9505 E-mail: lawasia@lawasia.asn.au
Please return this form by **16 April 2000** to ensure accurate processing of your registration. Registrations received after this date will attract a AU$50 administration fee.

Participant Details

Title (please check one) • Prof. • Dr. • Mr.• Mrs. • Miss.• Ms. • Other

Family/Surname ..... First Name: .....

Preferred order of name (for badge): .....

Firm/Organisation: .....

Position: .....

Postal Address • Office • Home

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Country ..... E-mail .....

Tel. ..... Fax. .....

Special dietary requirements (Halal, vegetarian, Kosher, etc): .....

Registration Fees

- LAWASIA member **AU$920/US$600** • Discount member* **AU$460/US$300**
- Non-member **AU$1050/US$680** • Discount non-member***AU$525/US$340**
- Optional Kakadu Field Trip**AU$500/US$325** **(Includes 1 nights accommodation at Gagudju Crocodile Hotel)**

- *discount applies to members of the profession admitted to practice for less than 5 years or members of the profession resident in Afghanistan, Bangladesh, Cambodia, Laos, Myanmar, Nepal, Pakistan, Sri Lanka and Vietnam.*

Cancellation & Refunds: If you have already registered and find that you are unable to attend the Conference, **you must notify the LAWASIA Secretariat of your request for a refund in writing.** Refunds will be made upon receipt of the written notice, less handling fee and bank service charges as follows:

Received until 16/04/2000 - 50% refund Received after 16/04/2000 - No refund

Speaker Profiles

Keynote Speaker

The Hon. Hilario G. Davide, Jnr. Chief Justice of the Philippines. Delivered the Supreme Court's judgement in the famous case *Oposa v. Factoran* which upheld the standing of children to seek redress to illegal logging on the grounds of ESD principles, particularly intergenerational equity.

Legal Speakers

Mr Antonio Oposa. The lawyer who had the imagination, the courage and the conviction to bring the case of *Oposa v. Factoran* on behalf of his children to halt the environmental destruction caused by illegal logging in the Philippines. He has received many international and national awards for his contribution to environmental law.

Mr M.C. Mehta. Another lawyer whose ideals, knowledge and expertise have been employed successfully in a series of environmental cases in India, including a famous case which resulted in the Supreme Court of India closing down polluting factories that were causing irremediable damage to the World Heritage listed Taj Mahal.

Professor Wang Xi. Vice Director of the Research Institute of Environmental Law, Wuhan University – the foremost environmental law centre in China, and the national Environmental Protection Agency of the PRC. He has been involved in the review of China's environmental laws as well as maintaining an enviable international program of work in the environmental law field.

Professor Koh Kheng Lian is from the Asia Pacific Centre for Environmental Law (APCEL), a new centre at the National University of Singapore founded with the assistance of the United Nations and The World Conservation Union. This centre is at the forefront of measures to build capacity in environmental law in the Asia Pacific region.

Professor Lye Lin Heng is Deputy Director of APCEL in Singapore and in addition, is currently a member of a working committee establishing a Masters degree in Environmental Management. She is a member of the IUCN Commission on Environmental Law and chairs the IUCN Working Committee on Environmental Law Education.

Professor Ben Boer is Professor at the Australian Centre for Environmental Law, the leading environmental law centre in Australia. His expertise in environmental law is not only known in Australia but is internationally recognised and sought.

Professor Neil Gunningham specialises in the field of environmental regulation. He has written widely and is the author of a number of books in the area including, most recently, *Smart Regulation: Designing Environmental Policy* (with Grabowsky, OUP), 1998). He has acted as consultant to a wide range of government bodies and is a former Fulbright Scholar and currently Professor of Law and Director of the Australian Centre for Environmental Law at the Australian National University.

Brian Preston, Senior Counsel, is a barrister at Selborne Chambers in Sydney where he maintains a high profile practice in environmental law. In addition, Brian contributes to the teaching of environmental law subjects at post-graduate level at the Faculty of Law, University of Sydney. He is Chair of the LAWASIA Standing Committee on Environmental Law and a member of the IUCN Commission of Environmental Law.

Scientific Speakers

Dr Peter Manins, Leader, Air Pollution Program and Manager, Environmental Consulting and Research Unit, CSIRO Australia

Dr Chris Mitchell, Atmospheric Research, CSIRO, Australia. Science Advisor to the Australian Environment Ambassador and coordinator of Australia's largest science program into global climate change.

Dr Ian Hannam, Manager, Land & Vegetation (Compliance), Department of Land and Water Conservation, Australia

Dr Garry Cook, CSIRO Wildlife and Ecology, Australia. Dr Cook is an expert on land and soil degradation in the Northern Territory's Top End.

Dr Max Finlayson, Head, Wetlands Research Program, Environmental Research Institute of the Supervising Scientist (ERISS) Australia.

Dr Rex Pyne is Deputy Director (Fisheries), Department of Primary Industry and Fisheries, NT, Australia. Dr Pyne, in his current role, has dealt with many fishery issues, most recently and notably, the invasion of Black Striped Mussels into Darwin's harbour environment.

ENVIRONMENTAL LAW ISSUES IN THE ASIA PACIFIC REGION

KAKADU NATIONAL PARK FIELD TRIP 16 – 17 MAY 2000

(All field trip participants will be preregistered for the main conference prior to departing Darwin)

Please note – All times are approximate and are subject to change

TUESDAY 16TH MAY 2000

11.45am Please assemble in the lobby of your hotel ready for collection by the AAT Kings coach. Brian Preston, Chair of the LAWASIA Environmental Law Standing Committee will be accompanying the group to Kakadu. N.B. There will be no stop for lunch enroute to Jabiru (a journey of approx 3 1/2 hours). Please make your own arrangements for lunch prior to our departure

12.00pm Participants will be collected from the official conference hotels. (Airport pick up for those delegates with prior arrangements)
Depart Darwin for Jabiru
Afternoon Tea enroute at the Bark Hut Inn

4.00pm Arrive Jabiru and check in at the Gagudju Crocodile Hotel
(Dress: Light, casual, comfortable clothing & footwear. A light cardigan or pullover. Don't forget to bring insect repellent, hat, water bottle and camera)

4.30pm Assemble in hotel lobby ready for departure to Nourlangie Rock

4.40pm Depart Gagudju Crocodile Hotel for Nourlangie Rock

5.15pm Visit to Nourlangie Rock where our guide will lead a walk to view ancient Aboriginal rock art

6.30pm Return to Hotel. Arrive Hotel at 7.00pm in time for a quick freshen up before Dinner.

7.30pm 'Bushtucker' Poolside Dinner BBQ – Gagudju Crocodile Hotel

WEDNESDAY 17TH MAY 2000

Please note – All times are approximate and are subject to change

N.B. It is essential that closed in footwear is worn at all times on the ERA mine site. Access to the site may be refused otherwise

5.30am	Participants to complete check out formalities. Any accounts for incidentals to be settled prior to departure this morning
5.45am	Assemble in hotel lobby ready for coach transfer to Yellow Waters Billabong
6.45am	Yellow Waters cruise departs. An informative talk will be given on board by Dr Max Finlayson, Head Wetlands Research Program, Environmental Reasearch Institute of the Supervising Scientist (Breakfast included)
8.45am	Cruise concludes
9.15am	Coach departs for ERA Ranger Uranium Mine
10.00am	Arrive ERA Ranger Uranium Mine Security Gate where the group will be met by representatives from ERA
10.15am	Commence tour of Ranger mining and milling operations Tour includes Pit 3 viewing area Pit 1 viewing area Milling process plant
12.00am	Depart for Bowali Visitor Centre A light lunch will be included and an informal talk over lunch will be given by a National Park Ranger
1.30pm	Depart Bowali Visitor Centre for Darwin Afternoon tea enroute
5.00pm	Arrive Darwin. Check in to your Hotel. Time to freshen up before the Welcome Reception.
6.00pm	Welcome Reception at Parliament House hosted by the Chief Minister of the Northern Territory, The Hon Mr Denis Burke, MLA