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Features of Australia's wetland biodiversity: Critical issues and strategic responses

CM Finlayson

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supervising scientist

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CM Finlayson
National Centre for Tropical Wetland Research, C/- eriss, Locked Bag 2, Jabiru, NT 0886, Australia (maxf@eriss.erin.gov.au)

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National Centre for Tropical Wetland Research, C/- eriss, Locked Bag 2, Jabiru, NT 0886, Australia (maxf@Eric.erin.gov.au)

Abstract

The critical issues for managing Australia's wetland biodiversity have been presented on many occasions in fora dominated by experts well versed in the biophysical sciences. A recent summary listed these as: provision of surface and groundwater for environmental benefits; prevention of pollution and contamination of aquatic habitats; prevention and reduction of salinisation; prevention of further drainage and infilling of wetlands; management of grazing in wetlands; restoration and protection of riparian vegetation; prevention and control of invasive species; mitigation of climate change and sea level rise; and development of rigorous inventory, assessment and monitoring protocols.

There has also been some discussion in these fora about the underlying or critical reasons behind the above-listed issues. However, such discussions have on the whole only involved social scientists in a cursory role. There has also been greater interaction between wetland scientists and wetland conservationists although at times this has seemed an uneasy alliance. Importantly, and perhaps most critically, representatives of community groups and industry sectors have increasingly and successfully expounded the need for greater consultation, communication and empowerment and reshaped the alliances between themselves, governmental officials and some scientists.

However, most of our responses have been uni-dimensional – focussing on single issues or single groups of stakeholders. Our responses need to be multi-dimensional and support the wise use of our wetland resources and provide accountability to other stakeholders. However, even if we accept this premise we still face major challenges. Foremost, we do not have sufficient information – we need to upgrade our inventory effort. We also need valid (risk) assessment and monitoring. And we need to make value judgements about the acceptability or otherwise of the outcomes. However, at the same time we are facing insidious global pressures that are challenging our established socio-economic order (e.g. trade globalisation) and biophysical environment (e.g. global climate change). Given that we currently do not have an inadequate information base for maintaining the ecological character of wetlands our major responses are surely hindered. Further, such pressures may make much current management effort redundant and challenge the myth of current adaptive management. This has led to efforts to link differing priorities and interests through assessment frameworks that outline the links that exist between a wetland, the goods and services that it provides and the proximal pressures and socio-economic drivers.

Features of Australia's wetland biodiversity: critical issues and strategic responses

Max Finlayson

National Centre for Tropical Wetland Research

eriss, Darwin/Jabiru, NT

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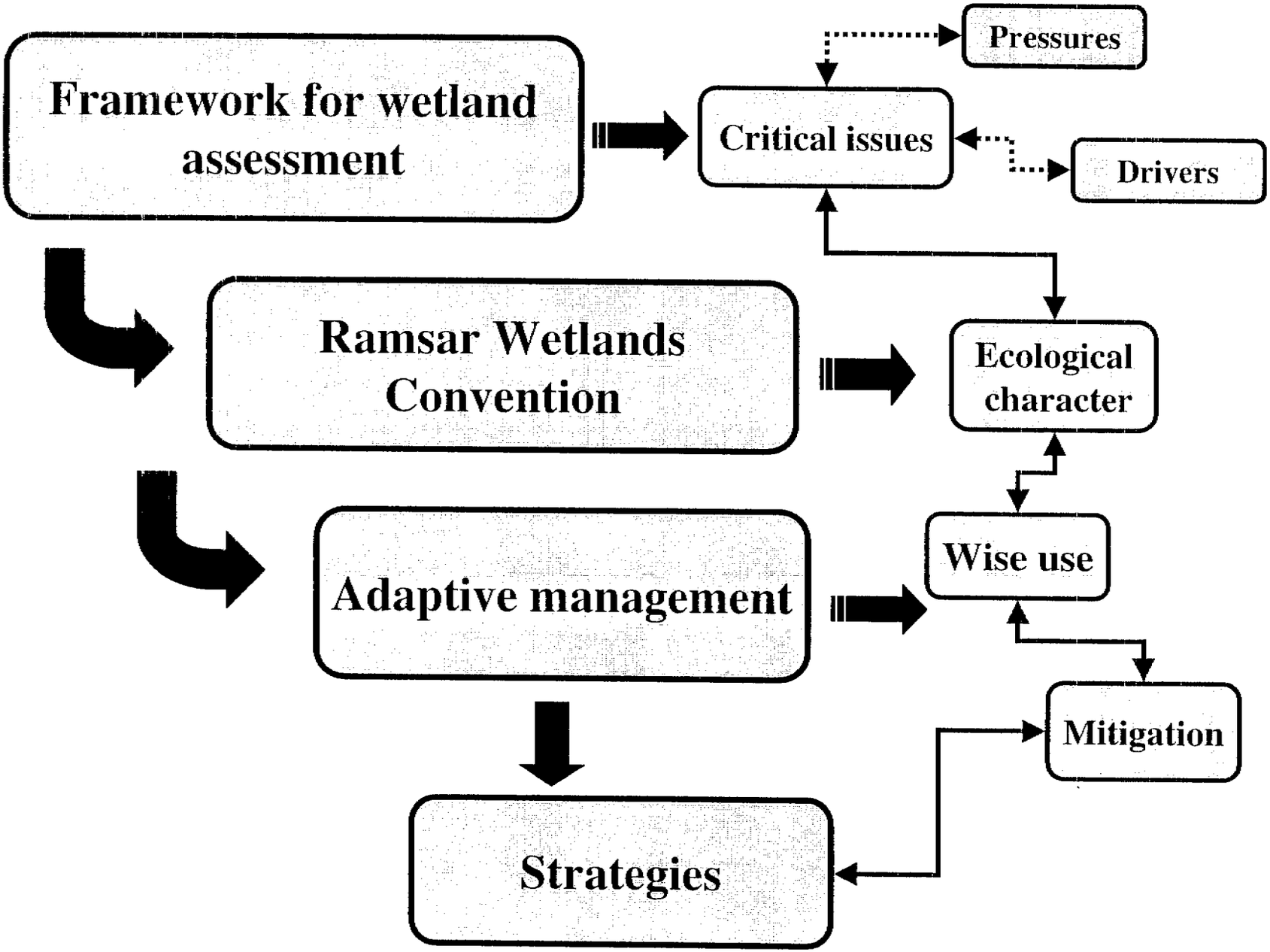
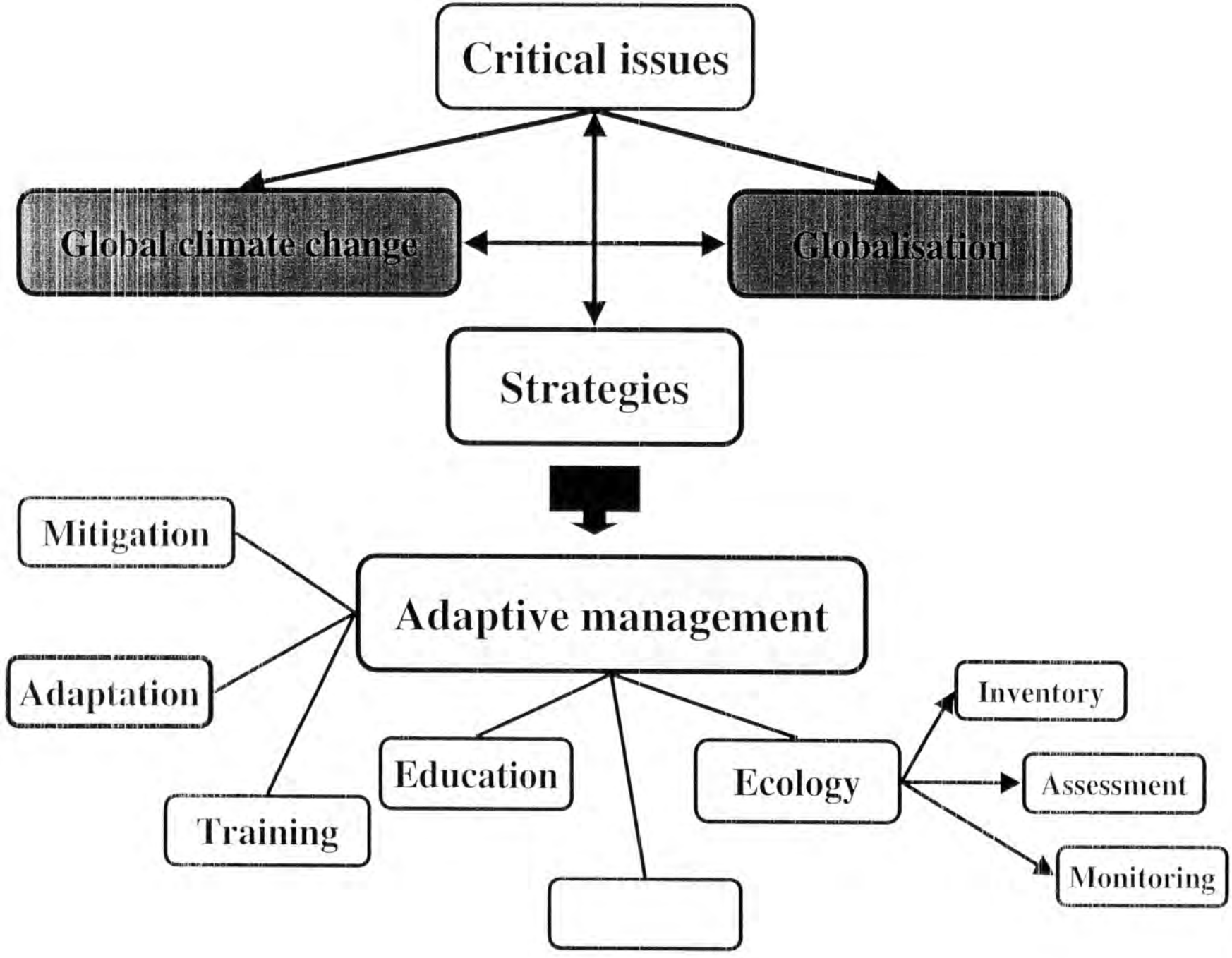
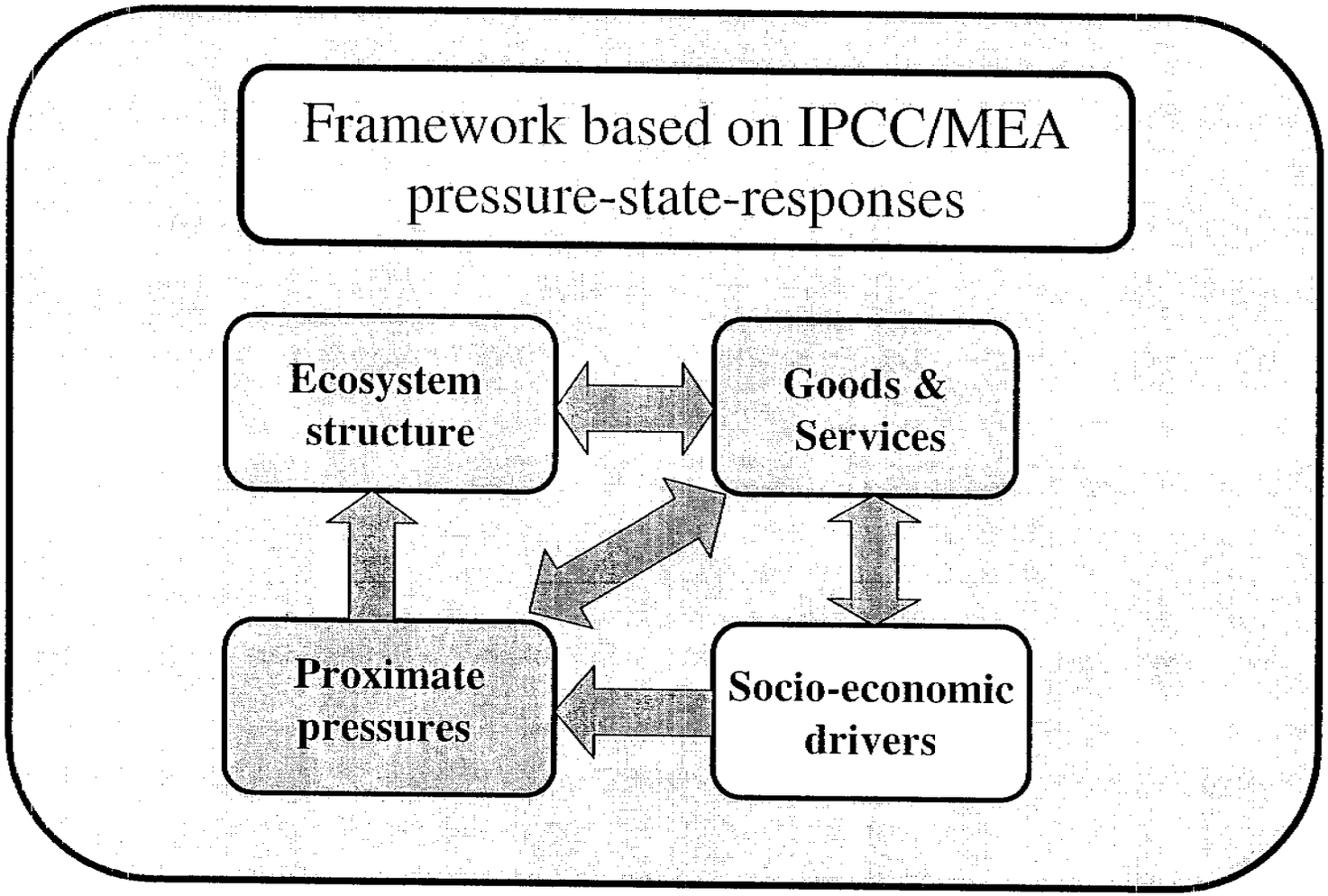
Environment Australia

Department of the Environment and Heritage

Supervising Scientist


Framework for wetland assessment
Pressures
Critical issues
Drivers
Ramsar Wetlands Convention
Ecological character
Adaptive management
Wise use
Mitigation
Strategies


Critical issues
Global climate change
Globalisation
Strategies
Mitigation
Adaptation
Adaptive management
Training
Education
Ecology
Inventory
Assessment
Monitoring



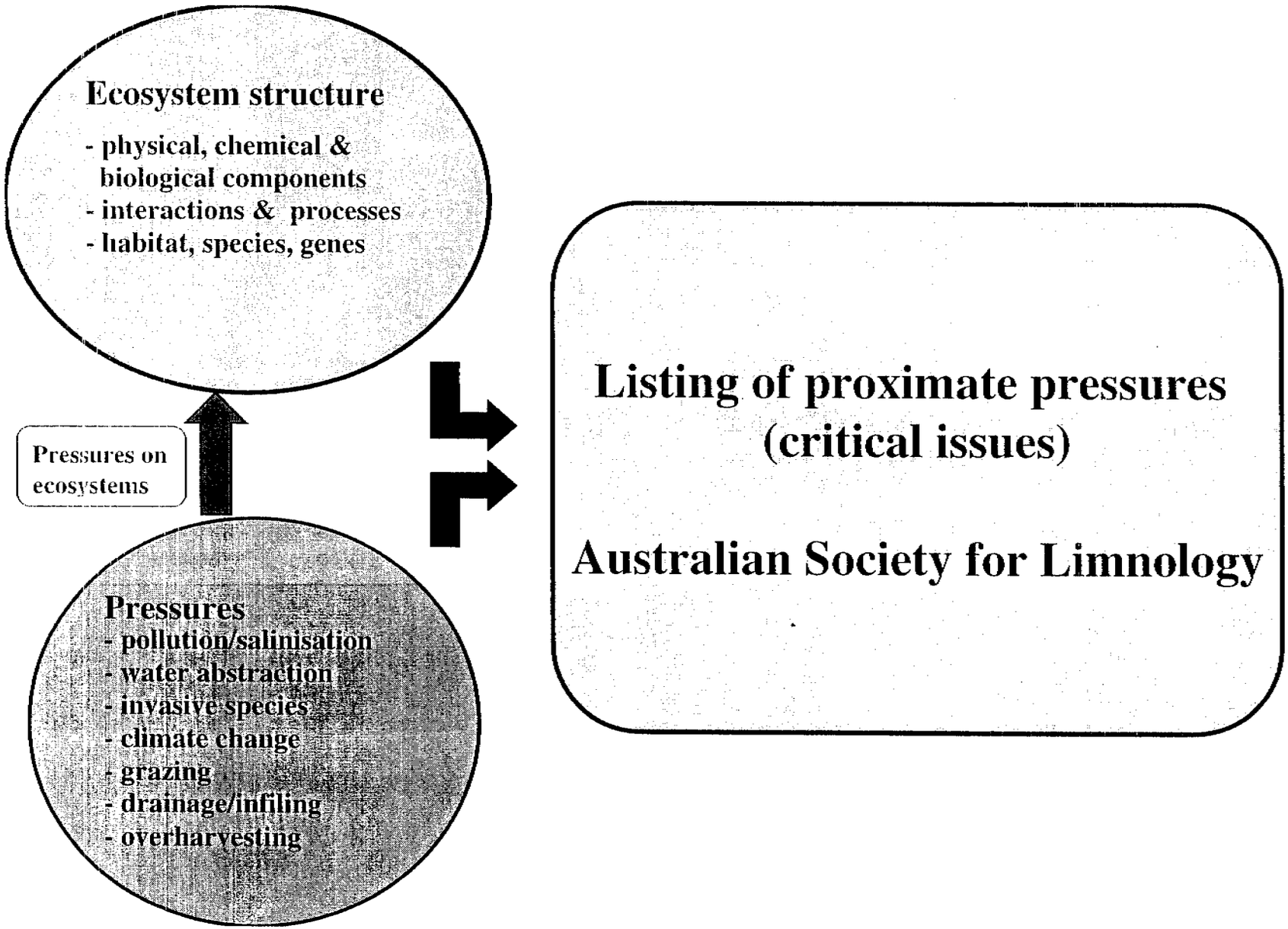
Framework for wetland ecosystem assessment

Ecosystem structure

- physical, chemical & biological components
- interactions, processes
- habitat, species, genes

Obtain more information on landscape processes and links - inventory, assessment and monitoring

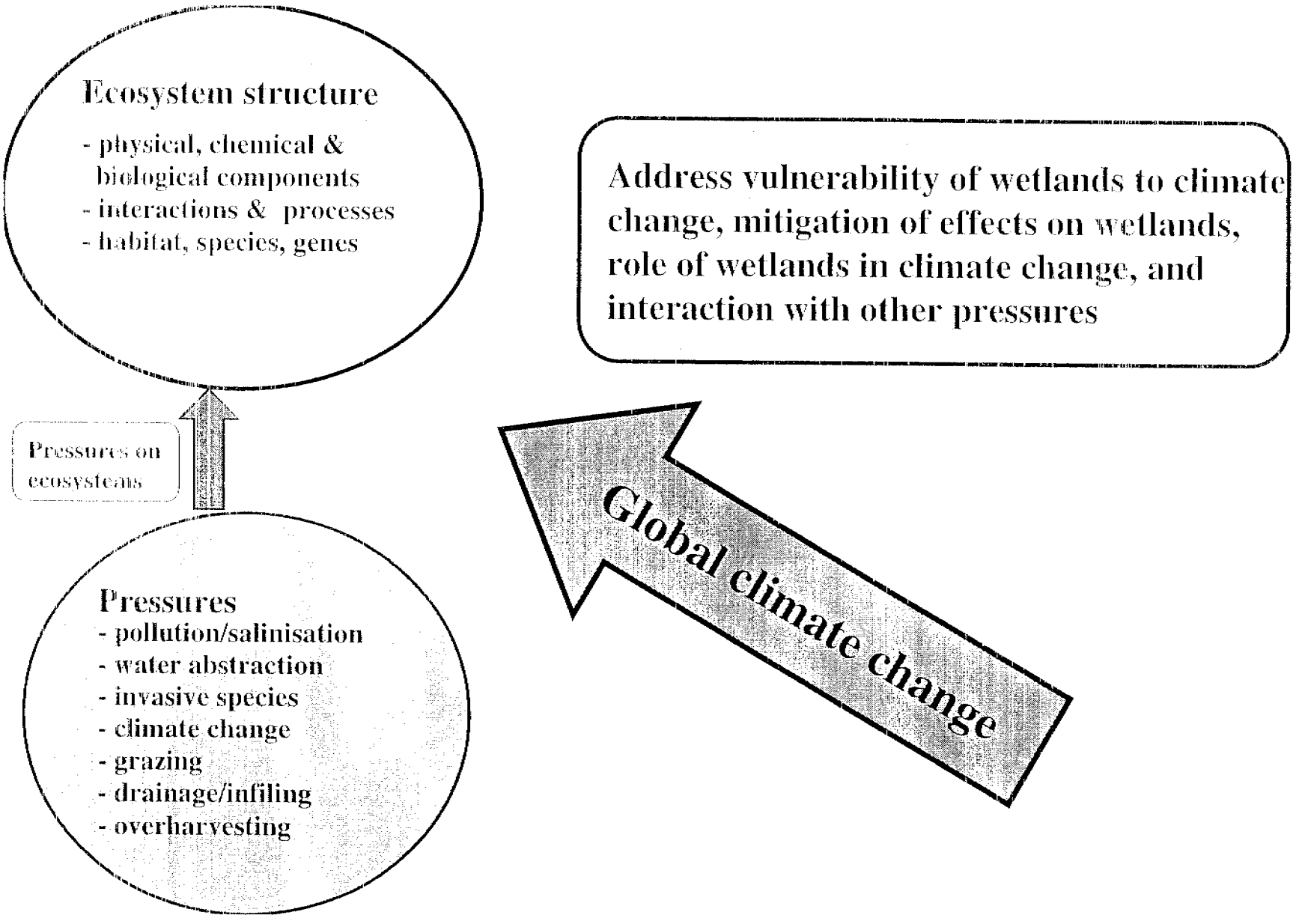
Wetland ecosystem assessment framework



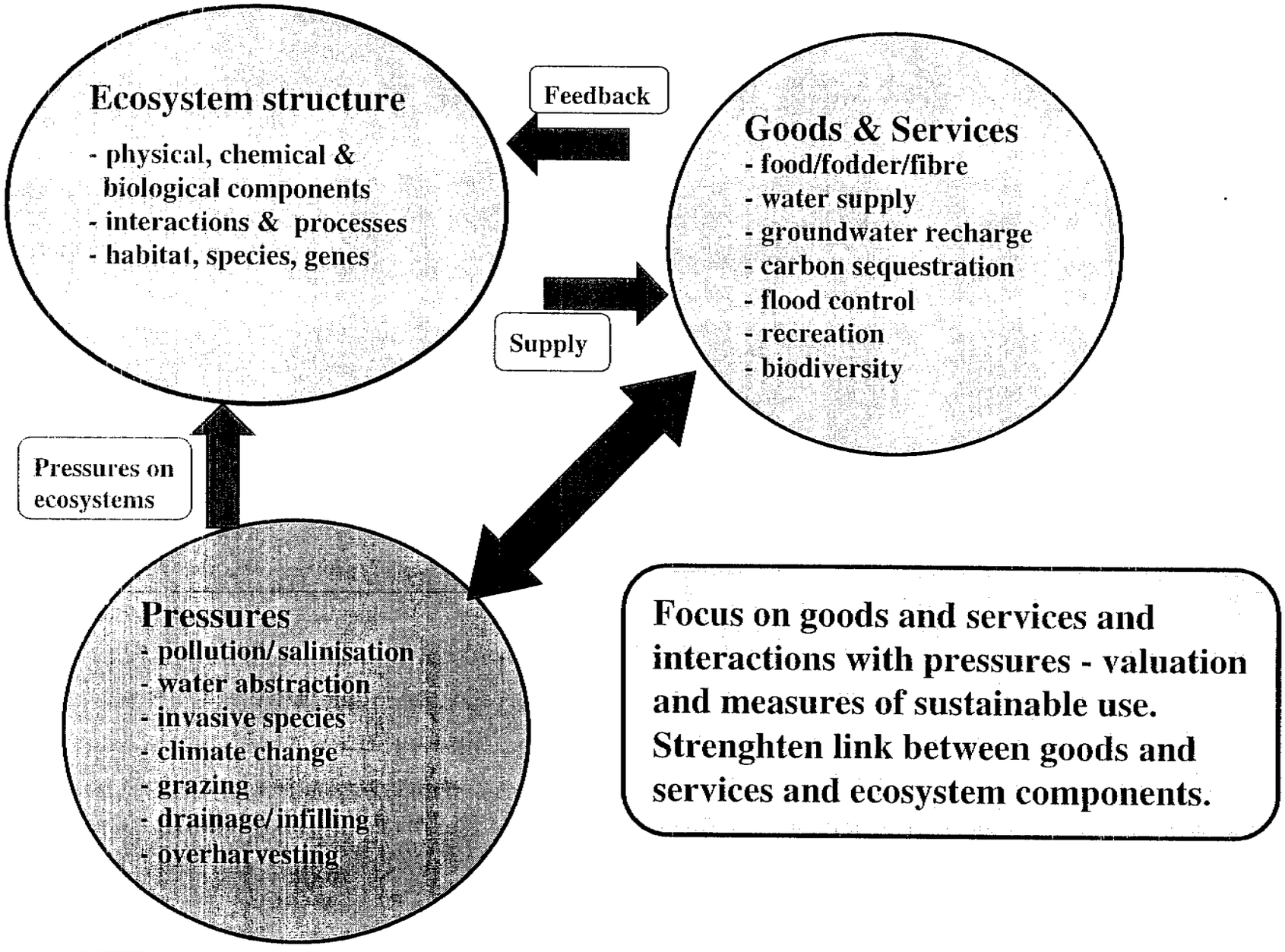
Wetland ecosystem assessment framework

Features of Australia's wetland biodiversity: critical issues

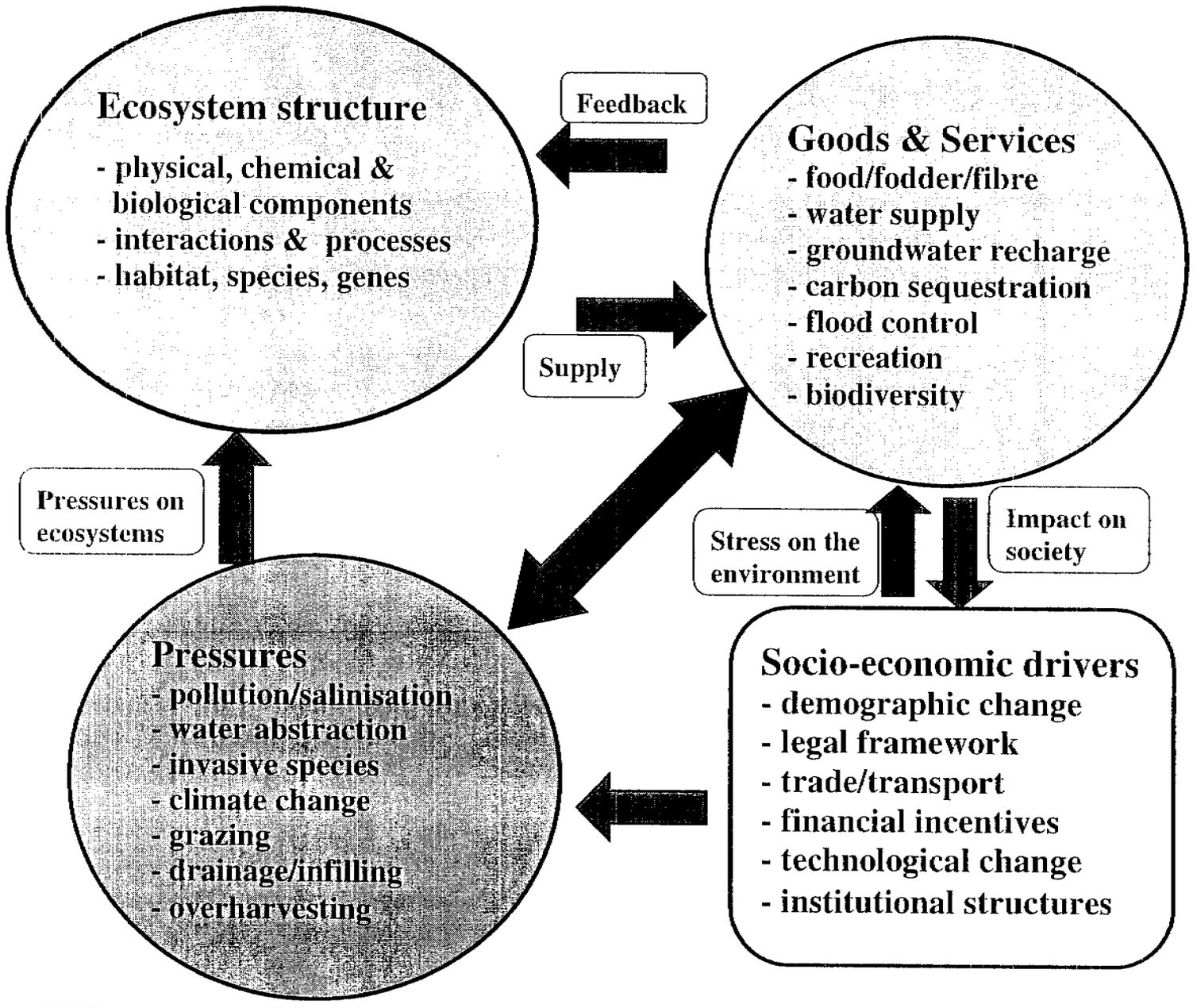
- provision of surface and groundwater for environmental benefits
- prevention of pollution and contamination of aquatic habitats
- prevention and reduction of salinisation
- prevention of further drainage and infilling of wetlands
- management of grazing in wetlands
- restoration and protection of riparian vegetation
- prevention and control of invasive species
- mitigation of climate change and sea level rise
- development of rigorous inventory, assessment and monitoring protocols



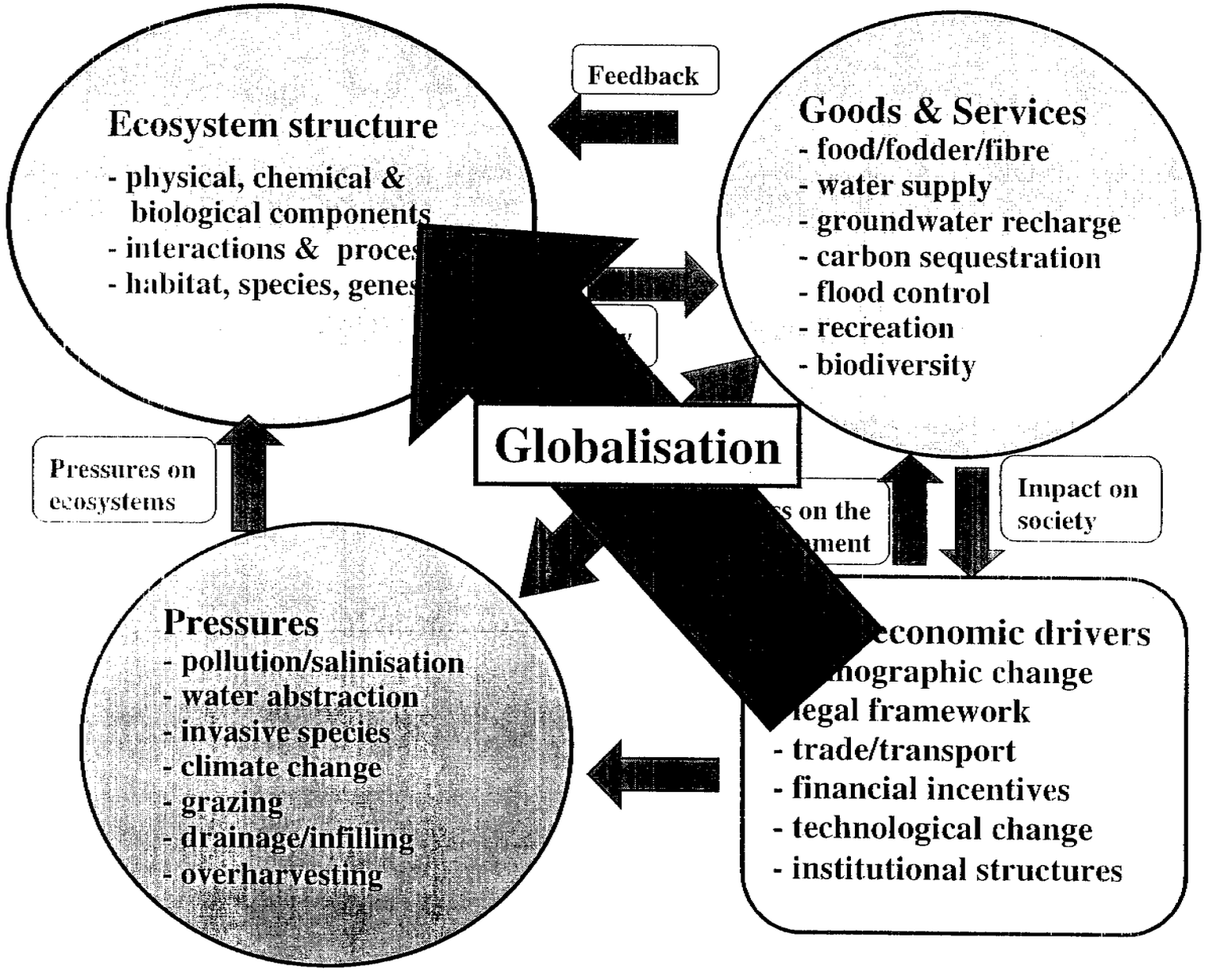
Wetland ecosystem assessment framework



Wetland ecosystem assessment framework



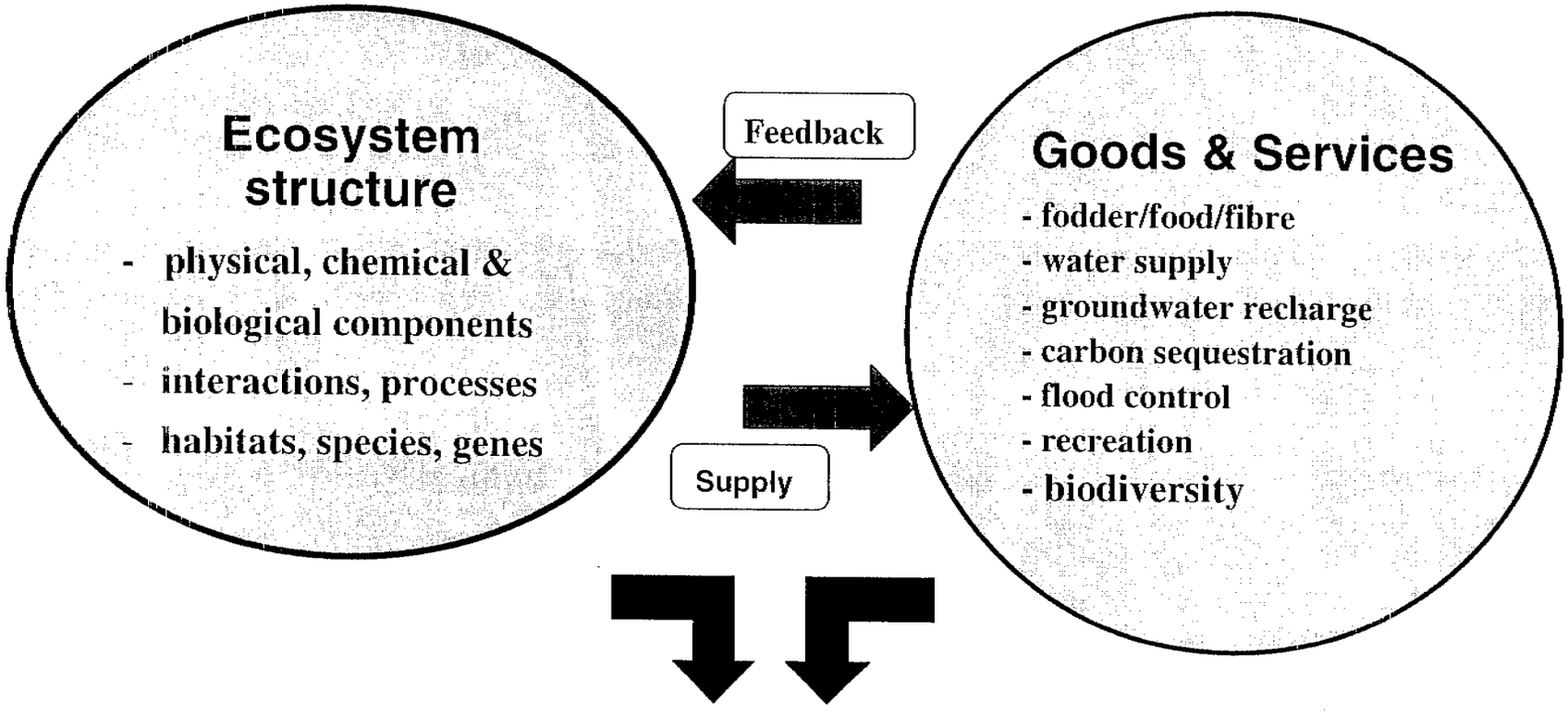
Wetland ecosystem assessment framework



Wetland ecosystem assessment framework

Wetlands Convention
Ramsar 1971

- List at least one wetland as internationally important - established criteria
- Maintain the ecological character of all wetlands - agreed definitions
- Make wise use of all wetlands - agreed guidelines and case studies



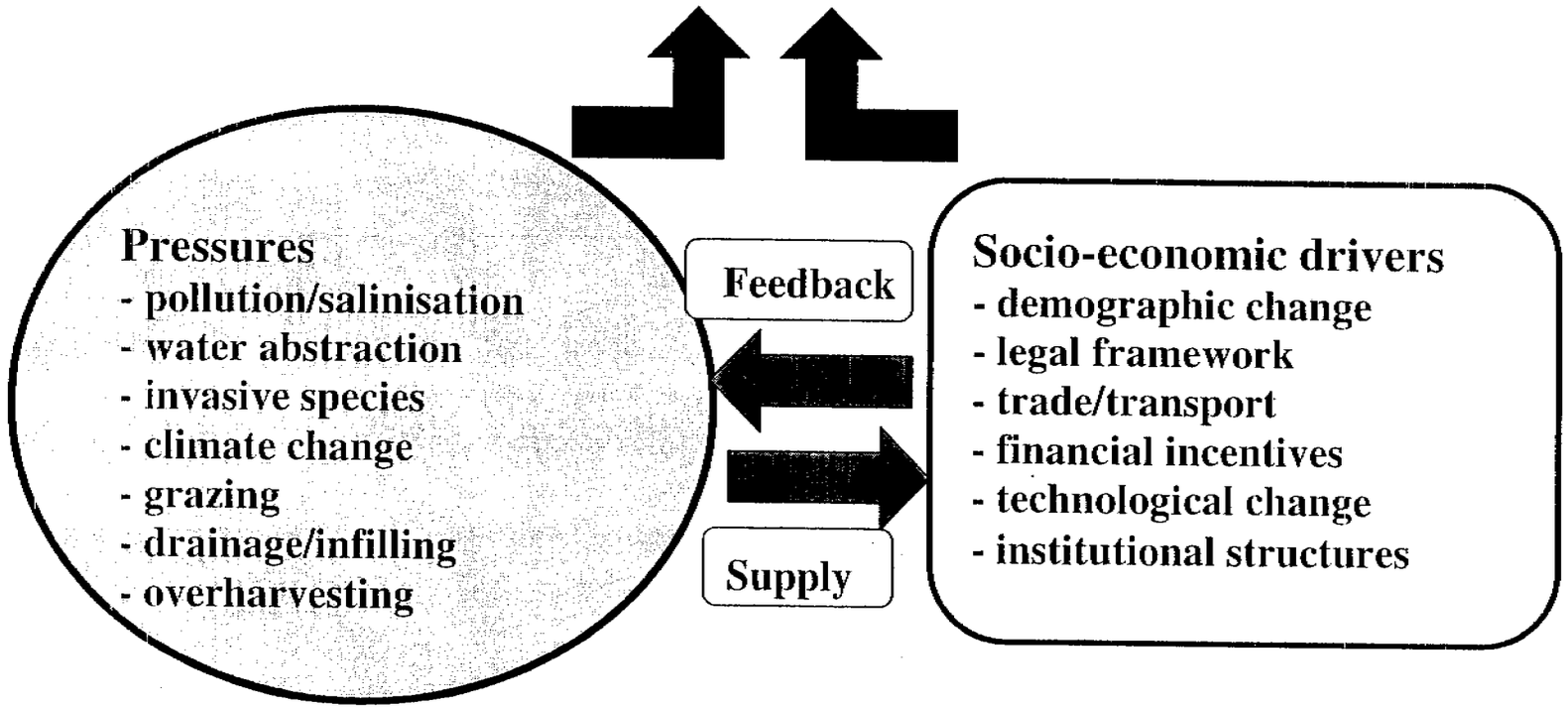
Ecological Character

The sum of the individual biological, chemical and physical components of the ecosystem and their interactions that maintain the wetland and its functions, products and attributes.

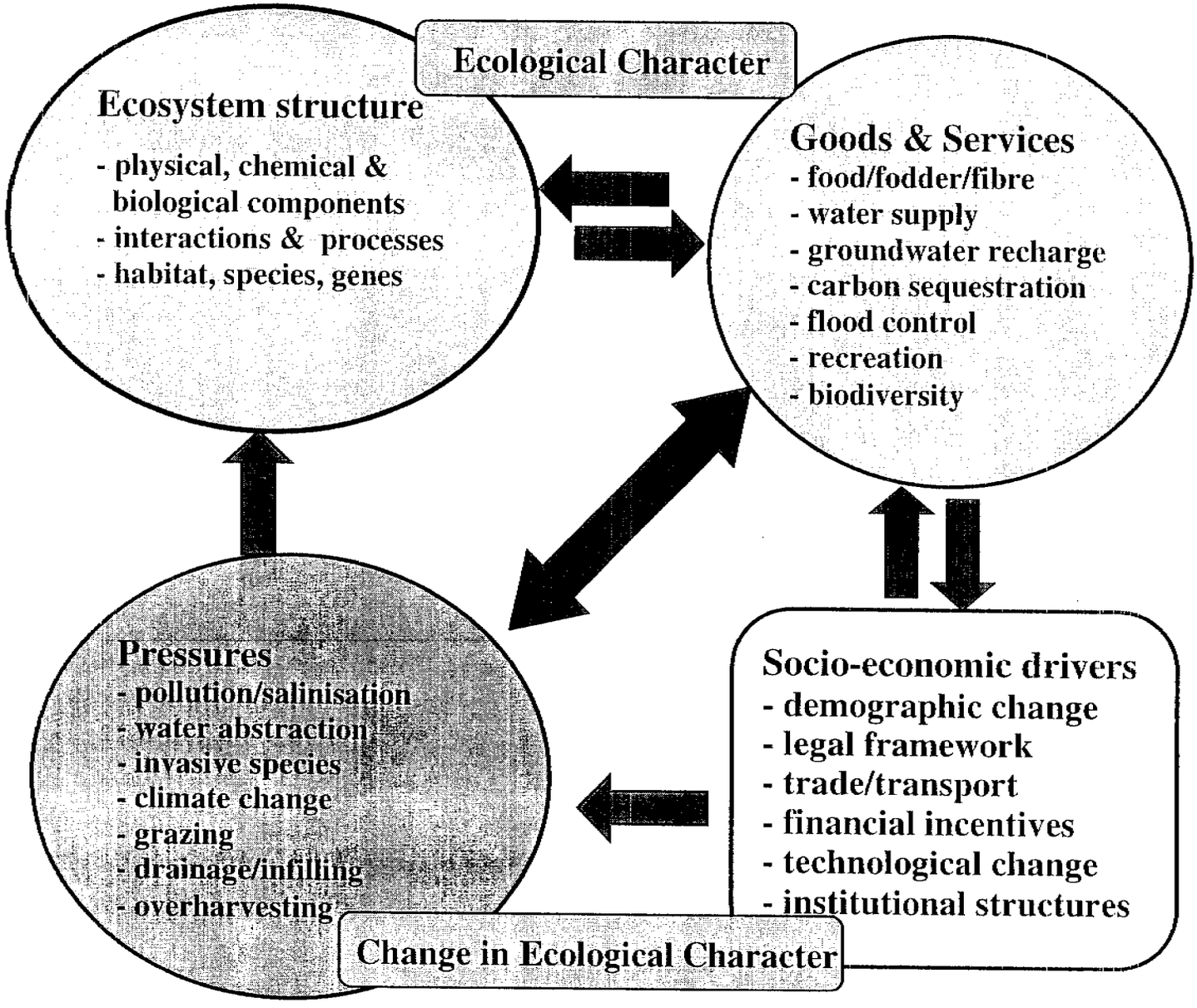
Ecological character of a wetland = *Ecosystem Structure* and *Goods & Services*

Change in Ecological Character

Is the impairment or imbalance in any biological, physical, or chemical components of the wetland ecosystem, or in their interactions which maintain the wetland and its products, functions and attributes.



Change in ecological character = *Pressures* and *Socio-Economic Drivers*

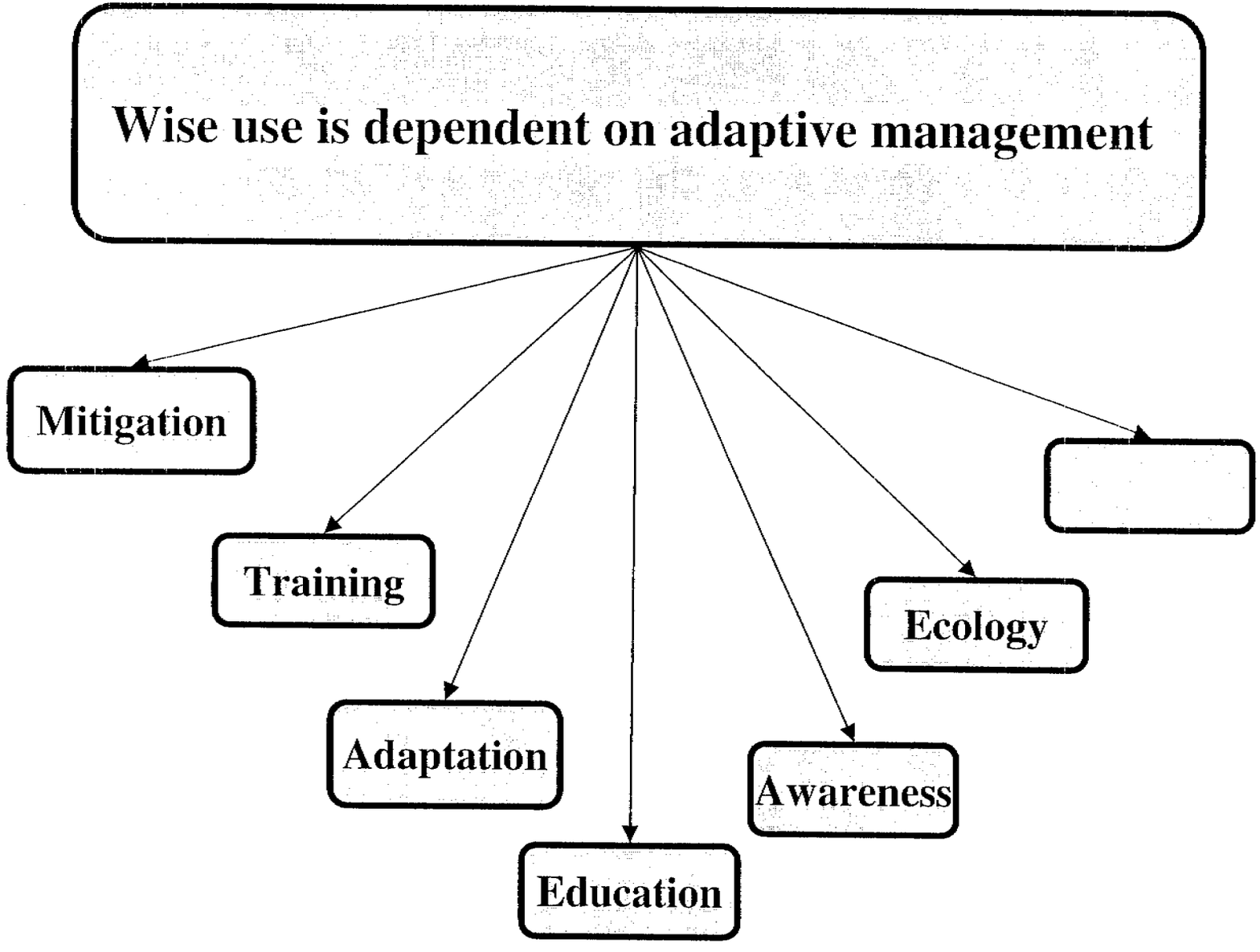


Framework for assessing the ecological character of a wetland

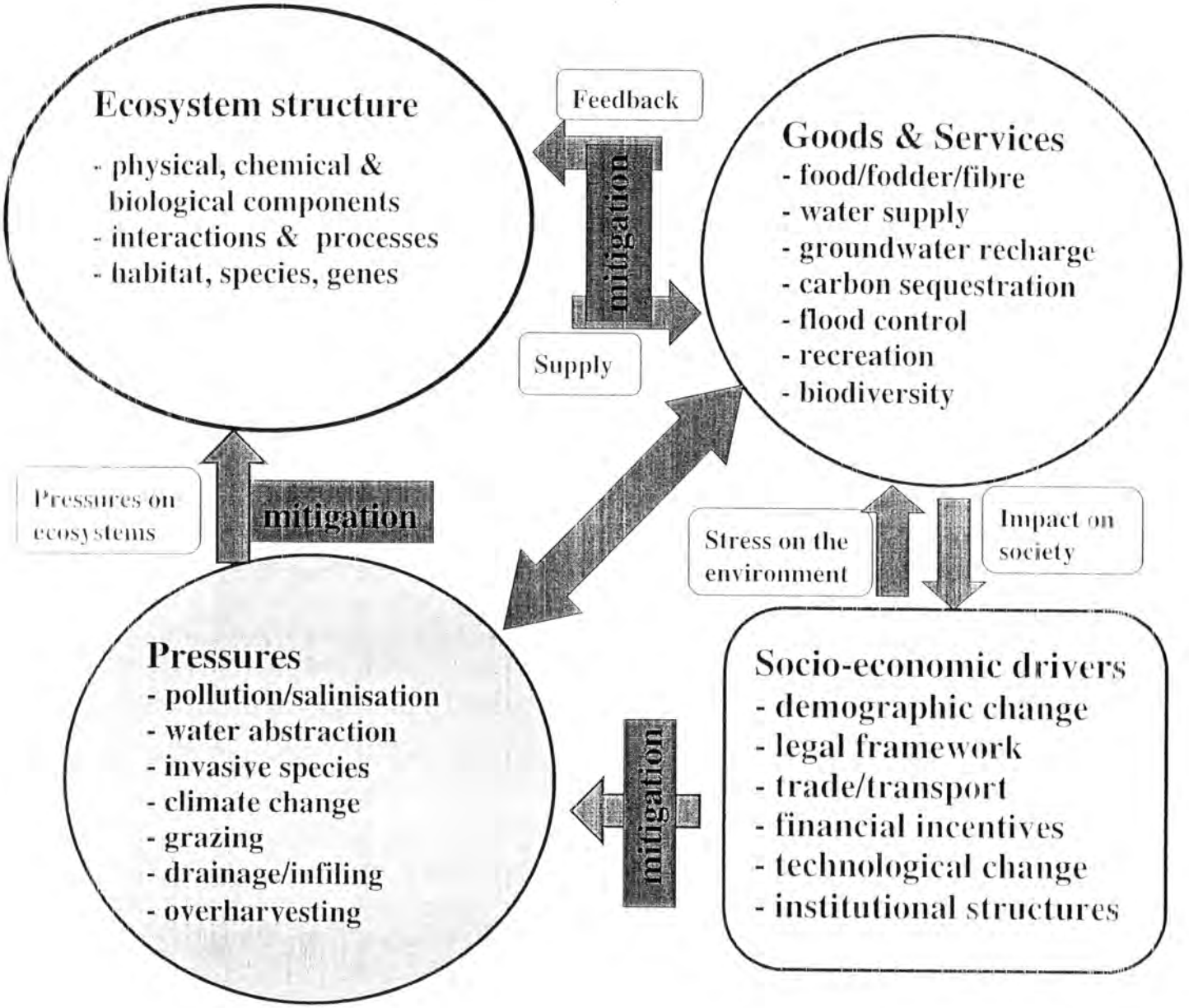
Wise use

Wise use of wetlands is their sustainable utilisation for the benefit of mankind in a way compatible with the maintenance of the ecological character of the ecosystem.

Management of wetlands = wise use of wetlands



Wise use of wetlands - adaptive management



Wetland ecosystem management framework

Features of Australia's wetland biodiversity: strategic responses

- Inventory, assessment and monitoring to ascertain ecological character of wetlands - landscape context
- Assessment and mitigation of multiple pressures - climate change
- Links between goods and services and pressures - valuation and measures of sustainability
- Links between proximate pressures and socio-economic forces and goods and services - globalisation
- Making wise use of wetlands - all components of adaptive management - whole ecosystem approach