

Groundwater dependent ecosystems in New South Wales – policy directions and projects

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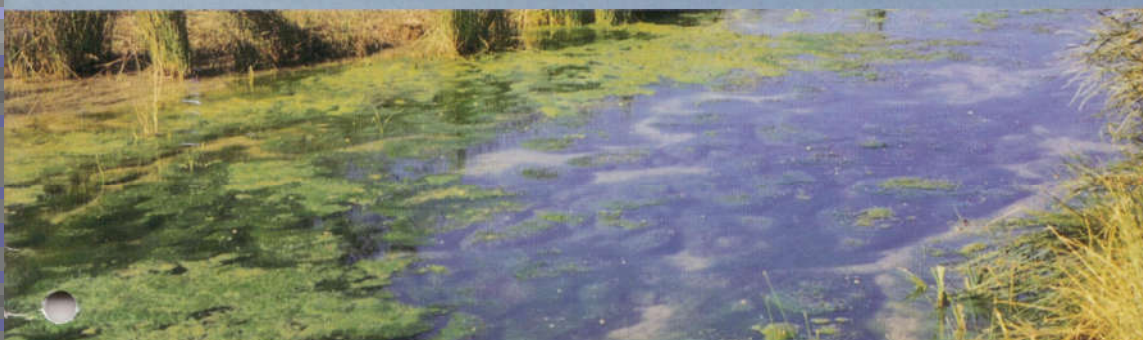
¹formerly NSW National Parks and Wildlife Service

²formerly NSW Department of Planning, Infrastructure and Natural Resources

The NSW State Groundwater Policy Framework Document



The NSW State Groundwater Quality Protection Policy



Hatton and Evans, 1998



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Dependence of Ecosystems
on Groundwater and its
Significance to Australia

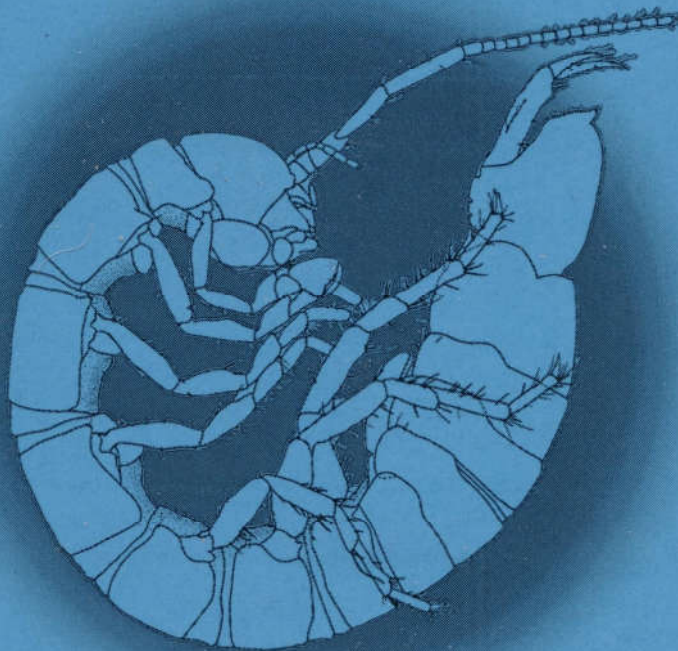
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Series**

**Hatton and Evans
identified four types
of groundwater
dependent
ecosystem:**

- terrestrial vegetation**
- river base flow systems**
- aquifer and cave
ecosystems**
- wetlands**

PPK, 1999



Desktop Methodology to Identify Groundwater Dependent Ecosystems

NATURE CONSERVATION COUNCIL OF NSW INC.



PPK
Environment & Infrastructure

SKM, 2001

National River Health Program

*healthy rivers living rivers
rivers for life*

ENVIRONMENTAL FLOWS INITIATIVE TECHNICAL REPORT
REPORT NUMBER 2

Environmental Water Requirements to Maintain Groundwater Dependent Ecosystems




Natural Heritage Trust
Helping Communities Help Australia
A Commonwealth Government Initiative

 Environment
Australia
Department of the Environment and Heritage

**PPK (1999) and SKM
(2001) added two
additional groundwater
dependent ecosystem
types:**

- terrestrial fauna**
- estuarine and near-
shore marine
ecosystems**

At last... legal acceptance of the existence of groundwater dependent ecosystems!



The NSW State
Groundwater Dependent
Ecosystems Policy

NSW Groundwater dependent ecosystems: management principles

Principle One: Values

The scientific, ecological, aesthetic and economic values of groundwater dependent ecosystems, and how threats to them may be avoided, should be identified and actions taken to ensure that the most vulnerable and the most valuable ecosystems are protected.

NSW Groundwater dependent ecosystems: management principles

Principle Two: Health

Groundwater extractions should be managed within sustainable yield of aquifer systems, so that ecological processes and biodiversity of their dependent ecosystems are maintained and/or restored. Management may involve establishment of threshold levels that are critical for ecosystem health, and controls on extraction in the proximity of groundwater dependent ecosystems.

NSW Groundwater dependent ecosystems: management principles

Principle Three: Quantity and Quality

**Priority should be given to ensuring
that sufficient groundwater of
suitable quality is available at the
times when it is needed for
protecting ecosystems which are
known to be, or are most likely to
be, groundwater dependent...**

NSW Groundwater dependent ecosystems: management principles

Principle Four: Precautionary Principle

Where scientific knowledge is lacking, the precautionary principle should be applied to protect groundwater dependent ecosystems. The development of adaptive management systems and research to improve understanding of these ecosystems is essential to their management.

Tools for managing GDEs (Gill and Ross nd).

- =Identifying GDEs and developing objectives and strategies for managing valuable ones.
- =Establishing minimum distances [and draw down cone geometry considerations] between bores and groundwater-connected wetlands or streams.
- =Ensuring that there are distances between contaminating industries in flow paths to GDEs.
- =Specifying limits for draw down where there are dependent ecosystems.
- =Establishing education programs.
- =Establishing and maintaining a register of groundwater dependent ecosystems.
- =Establishing research, monitoring and modelling programs.

What has happened for NSW groundwater dependent ecosystems as a result of water reforms?

- Sharing plans for priority groundwater management areas completed
- Very much heightened awareness of values of groundwater other than economic
- Recognition that we don't understand how to identify and quantify the water needs of such ecosystems

Current government projects in New South Wales

Priority GDE Register – lists GDEs that will have automatic protection in the consideration of new GDE licences.

Statewide GDE mapping program – with trials to deliver a process for identification, assessment and management of GDEs. Pilot areas are Lower Macquarie, Tomago/Tomaree/Stockton sand-beds

Hunter Water Operating Licence – approved with requirements to undertake GDE studies

Projects continued...

**Satellite thermal imaging based research
to establish water use in different
vegetation types Tomago and Kulnura
Studies at Mangrove Mountain –Kulnura
Plateau on:**

**Base flow quantification and monitoring
in hanging swamps**

Stygofauna studies (with UTS)

**Isotope studies to determine water origins
(with ANSTO)**

**Studies in the Barwon and Hunter
Regions aimed at better understanding
GDEs and their water requirements
(with LWA)**

**Search for an area to study groundwater
contributions and dependency on base
flow systems (with LWA)**

**Lessons learnt...
or queries to be
raised...**

**These may not be
capable of
resolution or
definition...**

Lessons and issues...

- What is groundwater [soil water]?
- Where do surface and subsurface wetlands begin and end?
- How is dependency evaluated and defined?
- Pigeonholes versus spectrums...
- Connections and connectivity...
- \$ valuing of ecosystem goods & services