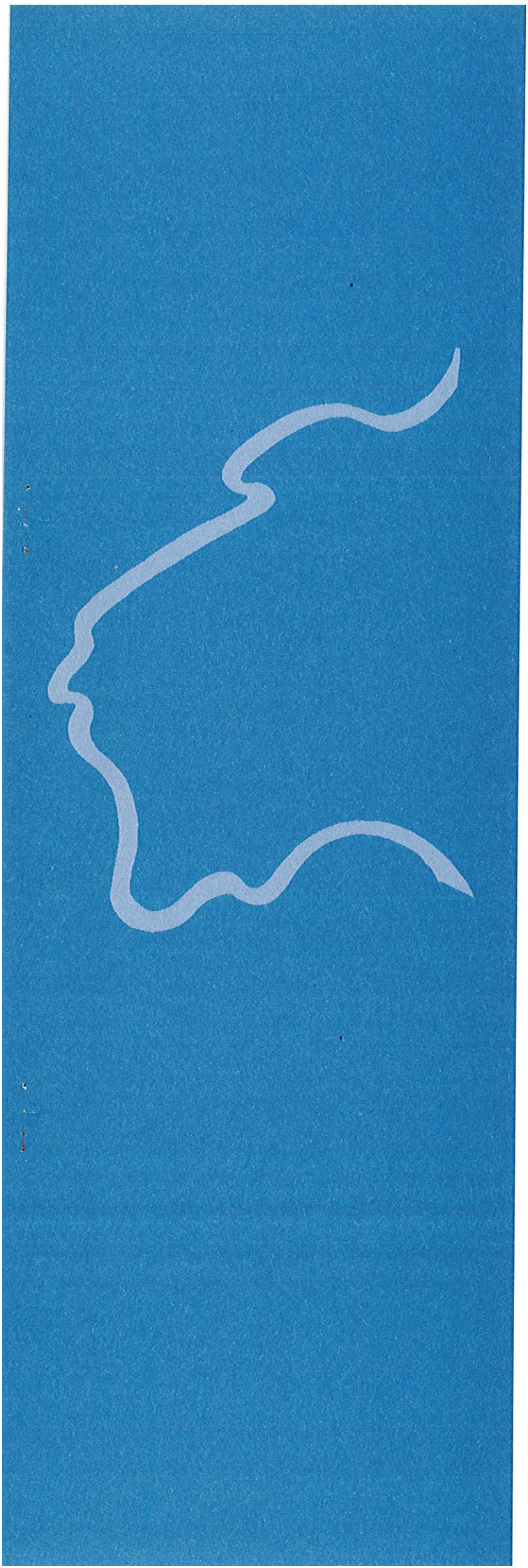


Environmental Protection Authority

Guidance for the Assessment of Environmental Factors

(in accordance with the Environmental Protection Act 1986)

Protection of the Lake Clifton Catchment

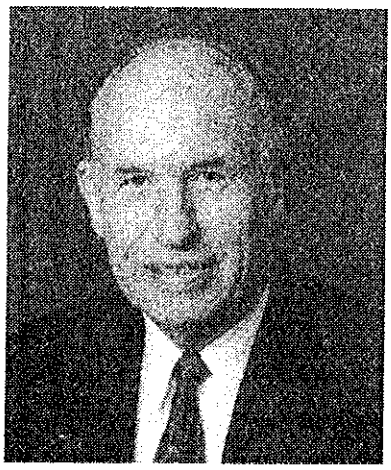
No. 28

Final

May 1998

Western Australia

Foreword



The Environmental Protection Authority (EPA) is an independent statutory authority and is the key provider of independent environmental advice to Government.

The EPA's objectives are to protect the environment and to prevent, control and abate pollution. The EPA aims to achieve some of this through the development of environmental protection guidance for the environmental impact assessment (EIA) of proposals.

In 1992, when the Environmental Protection Act 1986 was reviewed, a key sentiment expressed related to the uncertainty of outcome of the EIA process. The EPA addressed this concern by identifying priority factors for which EPA guidance and position statements needed to be developed to establish the grounds for judging the environmental acceptability of developments in advance of project planning and design.

This document is one in a series of documents being issued by the EPA to address this concern. The series is written to assist proponents, consultants and the public generally to gain additional information about the EPA's thinking in relation to aspects of EIA process. The series provides the basis for EPA's evaluation of and advice on development proposals subject to EIA.

The guidance and management criteria presented in sections 4 and 5 of the document will be used by the EPA in considering any proposal within the Lake Clifton catchment.

Where proposals meet the guidance and criteria it is unlikely that they will require formal assessment by the EPA.

Where a proposal initially cannot meet the above criteria, then it is likely that the impacts are considered to be of such significance to warrant formal assessment by the EPA. Where it is not possible to modify the proposal to meet these criteria, then it is likely that the EPA would recommend to the Minister for the Environment that the proposal be refused environmental approval.

I am pleased to release this document, termed Final, which will be used by the EPA during the assessment of any new proposal which impact on the Lake Clifton Catchment.

Final has the status of EPA signing off the statement and publishing it although it will be updated regularly as new documents come to hand.

Bernard Bowen

Bernard Bowen
CHAIRMAN
ENVIRONMENTAL PROTECTION AUTHORITY

1 May 1998

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Appendices

Guidance No. 28

Guidance for the Protection of the Lake Clifton Catchment

Key Words: thrombolites, Lake Clifton, wetlands, stromatolites

1. Purpose

The purpose of these Guidance is to describe the Environmental Protection Authority's environmental criteria which would provide a basis for managing new land uses and changes to certain existing land uses on private land within the catchment of Lake Clifton.

2. Objective

The objectives of these Guidance are:

(a) to protect the environment as defined by the *Environmental Protection Act 1986 (WA)* with a focus on maintaining the ecological integrity of Lake Clifton to support thrombolites, in particular, the factors of water balance in the Lake Clifton catchment, nutrient loads and regionally significant wetlands;

(b) to address the factor of uncertainty of outcome of the EIA process as raised in 1992 during the review of the EP Act 1986; and

(c) to present to developers, proponents who have proposals subject to environmental impact assessment (EIA) and the general public, the Environmental Protection Authority's (EPA) position on protection of Lake Clifton.

3. Introduction

Lake Clifton is one of the most significant wetlands in Western Australia. It is internationally important as a waterbird habitat and because it contains the largest known example of living stromatolites (properly called thrombolites), in a lake environment in the southern hemisphere. It is one of only seven lakes in the southern hemisphere where stromatolite-like structures are known to occur in hyposaline water (salinity less than seawater), and has been listed under the Ramsar Convention as having international importance. EPA Bulletin 788 identified thrombolites in the lake as the key environmental element requiring protection.

Lake Clifton is a wetland recommended for protection in System Six Red Book (Department of Conservation and Environment, 1983), and is protected by the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 (Western Australian Government, 1992).

Lake Clifton is located about 100 km south of Perth on the western edge of the Swan Coastal Plain between the Harvey Estuary and the coast (Appendix 1). The lake proper and much of the catchment to the west, north and south are within the Yalgorup National Park. However, for most of the eastern catchment only a narrow foreshore reserve is within the park, with the remainder of the land privately owned.

Lake Clifton is generally considered to be a 'sink' for water, including groundwater, with no direct drainage from the lake to the ocean. Its hydrology is complex, involving freshwater inflow from surface drainage, direct precipitation and groundwater, and water loss through evaporation.

The critical requirements for thrombolite growth are:

- constant source of carbonate and bicarbonate ions;
- low levels of nutrients; and
- light.

The fresh groundwater that flows into the lake does not affect the thrombolites directly, but is important in an indirect way as it :

- regulates lake salinity; and
- provides the carbonate and bicarbonate ions necessary for continued thrombolite growth.

Criteria have been developed to limit the environmental effects of changes to land use on private land within Lake Clifton's catchment in order to conserve the thrombolites and the environmental processes which enable the thrombolites to continue to exist. The most important environmental aspects are hydrology, water quality and direct disturbance.

One crucial aspect is to manage the growing development pressure within the catchment from three sources:

- land uses using large quantities of water and fertiliser, in particular, horticulture;
- increasing demand for rural/residential developments as the Mandurah urban area expands further south; and
- increased tourist interest in the lake and the thrombolites.

The development of these criteria complements two other initiatives by Government agencies:

- Yalgorup Lakes Study being carried out by the Water and Rivers commission funded by a grant from the National Landcare Programme. This study will examine the hydrological regimes of Lakes Clifton and Preston. It aims to map groundwater movement in and out of the lakes and examine sources of nutrient export; and
- Coastal and Lakelands Planning Strategy recently released by the Ministry for Planning for the Western Australian Planning Commission (Western Australian Planning Commission, 1997) which proposes a landuse management strategy for land within the catchments of the Yalgorup Lakes.

On 27 February 1996 the Western Australian Planning Commission (WAPC) endorsed the EPA criteria subject to minor word changes for lot size for rural/residential developments. These changes have been included in these final Criteria. The Coastal and Lakelands strategy reflects the endorsed EPA and WAPC position.

The EPA acknowledges that the Yalgorup Lakes study presently being conducted is an important initiative and will provide valuable information on future management of Lake Clifton and its catchment. the first results should be available in 1998.

However, the criteria need to be developed now to help manage current development pressure on the catchment. Should the results of the Yalgorup Lakes study point to the need for greater controls on new land uses, then the criteria will be updated accordingly. Further, if the study reveals that existing land uses are causing significant environmental problems, an Environmental Protection Policy (EPP) may be formulated.

3.1 Human pressures

Thrombolite growth is strongly affected by several factors that are related to human use of the lake area, notably:

- nutrient input to the lake;
- changes in the water balance; and
- direct physical impacts, such as trampling of thrombolites, loss of fringing vegetation, erosion, and increased water turbidity, caused by human and stock use of the lake edge.

3.2 Key land uses requiring management

Certain forms of land use could threaten the thrombolites if not managed carefully or excluded from the catchment. These are:

- intensive horticulture;
- rural/residential developments; and
- tourist developments.

4. Guidance for the protection of Lake Clifton Catchment

4.1 The environmental objective

To prevent development in the area surrounding Lake Clifton which could threaten the thrombolites The key land uses in the Lake Clifton catchment requiring application of the final criteria were identified as:

(a) intensive horticulture

(b) rural/residential developments

(c) tourist developments

4.2 The Environmental Protection Authority Criteria for new land use developments in the catchment of Lake Clifton

Key environmental factors	Objectives
1. Water balance	New developments be managed so that the water balance following development is as close to pre-development conditions as possible.
2. Nutrient loads	New developments be managed so that phosphorus and nitrogen export to the lake is negligible. A net reduction at least should be achieved.
3. Regionally significant wetlands	New developments be managed so that direct impacts of humans and stock do not cause physical damage to the thrombolites, wetland vegetation, fringing wetland vegetation and dryland buffer of Lake Clifton.

5. Criteria and management plan

5.1 Horticultural developments

(a) Water allocation based on Water and Rivers Commission sub-catchments (Appendix 2 shows the approximate sub-catchment boundaries):

- Lake Clifton sub-catchment 2 000 kL/ha/year;
- Island Point sub-catchment 750 kL/ha/year; and
- Coastal sub-catchment 375 kL/ha/year.

(b) Management criteria:

- no horticultural development on the Vasse soils (those associated with the fringing wetland of Lake Clifton);
- horticulture to be setback a minimum of the lake of 150m, with at least 20m of unused Spearwood sand between the crop and the Vasse soil;

- horticulture to be on soil with a minimum depth to groundwater of 2m;
- a vegetated buffer of at least 20m should be retained within the horticulture exclusion zone;
- no surface water run-off from the horticultural area;
- maximum fertiliser rates (in the cropped area) of:
  - nitrogen 200 kg/ha/year
  - phosphorus 100 kg/ha/year;
- the Water and Rivers Commission, Agriculture Western Australia and the two local authorities Mandurah and Murray should work together so that any new applications for horticultural well licences comply with these criteria, through development of appropriate farm plans which include the minimum requirements described above; and
- land use management should include soil testing, so that fertiliser application rates can be modified where testing indicates that there is sufficient phosphorus and nitrogen in the soil.

5.2 Rural residential developments

The following management criteria have been adopted by the EPA:

- For any subdivision within the catchment, the average lot size should not be less than 5 ha. In achieving the average lot size, no lot should have an area of less that 2 ha. Further subdivision of the same land, or part thereof, should not be permitted where this would result in an average lot size less than the 5 ha as originally determined. Innovative design measures to reduce potential impacts, for example clustering, should be used where lot sizes are allowed below 5 ha while maintaining the overall 5 ha average;
- domestic water allocation should be limited to 1 500 kL per lot per year;
- conventional septic systems should not be permitted, instead alternative effluent systems with high nutrient retaining capacities should be used;
- stock should only be allowed in the area of the lot between the building envelopes and the edge of the lot as an occasional fire control measure on those lots already parkland cleared (ie tree canopy intact but understorey largely cleared);
- stocking rates (as advised by Agriculture Western Australia) should be determined based on area of cleared land, and not total lot size;
- stocking rates should be set as those for dry pasture, with no importation of feed allowed;
- for lots adjacent to the lake, either the number of lots abutting the lake should be minimised, or appropriate management measures should be applied to reduce uncontrolled human access to the lake, the vegetated buffer and the thrombolites (eg. fencing, directed access to a particular location(s), in consultation with CALM);
- building envelopes should:
  - not be located on the Vasse landform type,
  - be set back at least 150m from the highwater mark of the lake (as defined by the edge of the salt water dependent wetland vegetation species), and
  - be set back at least 20m between the edge of the Vasse landform and/or freshwater wetland.
- intensive land uses requiring high water and fertiliser usage should not be permitted;
- for lots covered with native vegetation, clearing of vegetation should be restricted to the provision of services and building envelopes;
- for lots parkland cleared, wherever possible, the loss of trees should be avoided through careful design of the lot (position of building envelopes, track and fire breaks etc); and

- unless otherwise determined by the Western Australian Planning Commission, and in accordance with the Coastal and Lakelands Planning Strategy, subdivision should be supported by Town Planning Scheme provisions, where appropriate, to ensure that these criteria can be met.

5.3 Tourist developments

Tourist developments must be consistent with the management plan for the Lake and Yalgorup National Park as prepared by the Department of Conservation and Land Management (for the National Park and Nature Conservation Authority) (CALM, 1995), and may require referral to the Environmental Protection Authority for environmental impact assessment. In the long term the Coastal and Lakelands Planning Strategy, once finalised, will address this issue.

The City of Mandurah and the Shire of Waroona, in consultation with the local tourist industry and the Department of Conservation and Land Management, should develop a coordinated strategy to manage day tourist visitors to Lake Clifton.

5.4 Other proposals

In order to retain the existing catchment characteristics, proposals involving vegetation clearance or proposals involving revegetation, or the replacement of existing native vegetation with high water-using tree species (eg. blue gums) should be referred to the Environmental Protection Authority for environmental impact assessment.

5.5 Proposals not meeting these criteria

Where a proposal initially cannot meet the above criteria, then it is likely that the impacts are considered to be of such significance to warrant formal assessment by the EPA. Where it is not possible to modify the proposal to meet these criteria, then it is likely that the EPA would recommend to the Minister for the Environment that the proposal be refused environmental approval.

6. Application

6.1 Area

Appendix 1 shows the area of land subject to the management criteria and generally coincides with what is understood to be the groundwater catchment of Lake Clifton with some margin for error given the uncertainty in defining this catchment. The Yalgorup Lakes study will better define the catchment and be based on hydrological measurements. The area subject to the criteria is generally defined as being bordered on the west by the ocean, and on the east by the high ridge line directly east of the lake. The northern and southern boundaries of this area correspond to convenient cadastral boundaries.

As a guide to land owners in the region and the two local governments, the area subject to the criteria can be described as including:

- all land to the west of Old Coast Road, between an east-west line approximately 1.5 km south of White Hill Road, and Preston Beach Road; and
- all land east of Old Coast Road which is also
  - west of the ridge line approximately 2 km from the lake,
  - south of where the ridgeline crosses Old Coast Road, and
  - north of Johnston Road.

The boundaries shown in Figure 1 are available digitally for a geographic information system, and can be made available on request from the Department of Environmental Protection.

6.2 Duration and review of criteria

The EPA will review the criteria and any subsequent Environmental Protection Policy (EPP) under two circumstances:

- When the Yalgorup Lakes study has been completed and the final recommendations are made to Government. In reviewing the criteria, the EPA will be looking for maximum consistency between these criteria and the information and recommendations in that study.
- It is anticipated that there will be ongoing monitoring of the lake by the Water and Rivers Commission and the CSIRO. In the event that there is a significant deterioration in the lake environment, the EPA will review its criteria on the protection of the Lake Clifton catchment.

7. Responsibilities

7.1 Environmental Protection Authority responsibilities

The EPA will apply this Guidance Statement in making decisions about whether or not to assess any proposal for use which could impact upon Lake Clifton, and in any assessment of such proposals.

The EPA will recommend to the Minister the imposition of these requirements following its assessment of the proposals for which the protection of the thrombolites at Lake Clifton is a relevant factor.

7.2 Western Australian Planning Commission Role

All planning developments requiring zoning and subdivision can be dealt with by the WAPC within the policy framework as set out in the Coastal and Lakelands Strategy. Given that this Strategy is consistent with the EPA Criteria, it is expected that the WAPC will deal with planning proposals in the catchment consistent with EPA objectives and would remove the need for referral to, and assessment by, the EPA.

Once the Coastal and Lakelands Strategy has been finalised following the public review period, the relevant Local Governments would be required to reflect the Strategy. It is expected, therefore, that any development within the Lake Clifton catchment which is being considered by the Local Governments would be managed to be consistent with the EPA Criteria without the need for referral to the EPA.

It is expected that both the WAPC and the Local Governments would either refuse proposals inconsistent with the EPA Criteria or modify them so as to be consistent with the Criteria. Only those proposals inconsistent with the Criteria which the WAPC or the Local Government believe are worthy of support should be referred to the EPA.

7.3 Department of Environmental Protection responsibilities

The DEP will assist the EPA in applying this Guidance Statement in environmental impact assessment and conduct its own functions under Part V of the Environmental Protection Act in accord with the Guidance.

7.4 Proponent responsibilities

Where proponents demonstrate to the EPA that these Guidance requirements are accountably and enforceably incorporated into proposals, the assessment of such proposals is likely to be expedited.

8. Definitions and Abbreviations

AHD	means Australian Height Datum (equivalent to the low water mark at Fremantle + 0.756m).
DEP	means the Department of Environmental Protection
CALM	means the Department of Conservation and Land Management
CSIRO	means the Commonwealth Scientific & Industrial Research Organisation
EIA	means the environmental impact assessment
EPA	means the Environmental Protection Authority
EPP	means an Environmental Protection Policy
Guidance	means guidance on possible means for achieving desired environmental outcomes.
thrombolite	means biologically produced limestone structures in the lake. Historically they have been called stromatolites. Studies by Moore (1991) has correctly classified them as thrombolites.
WRC	means the Water and Rivers Commission
WAPC	means the Western Australian Planning Commission

9. Limitations clause

This guidance for environmental impact assessment has been prepared by the Environmental Protection Authority to assist proponents and the public. While it represents the contemporary views of the Environmental Protection Authority, each proposal which comes before the Environmental Protection Authority for environmental impact assessment will be judged on its merits. Proponents who wish to deviate from the contents of this document should, however, be prepared to justify that departure.

10. References

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Draft Guidance
Preliminary Guidance
Interim Guidance
Guidance May 1998

Status Not signed off by the EPA at this stage

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Acknowledgments

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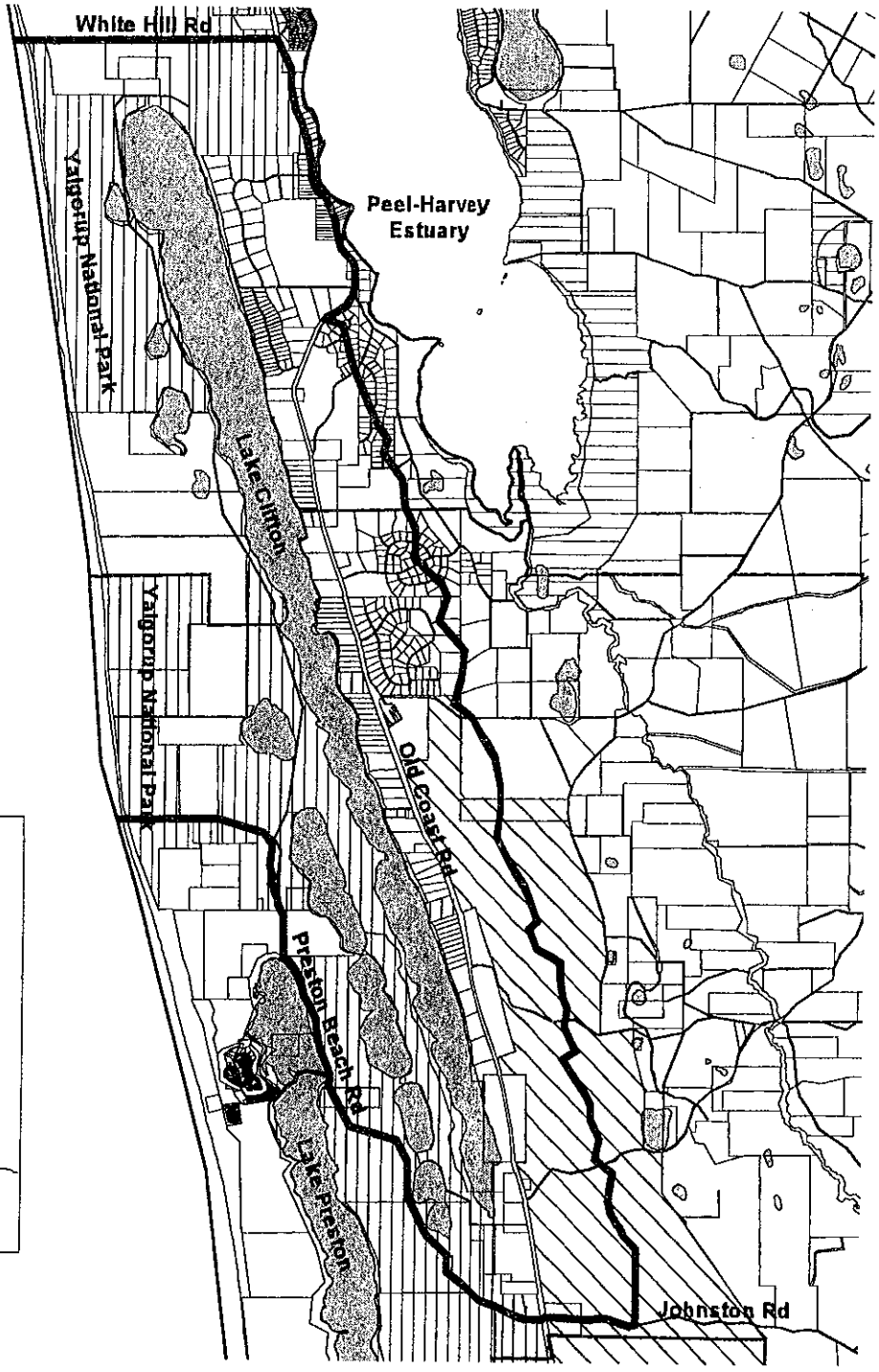
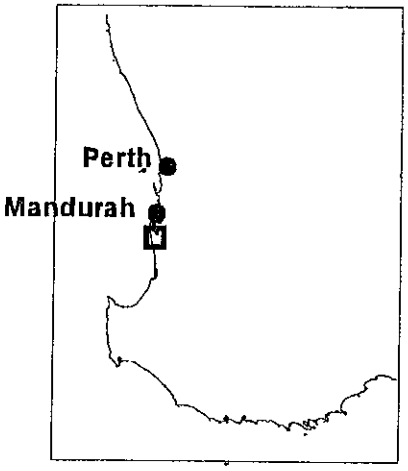
Appendix 1

Lake Clifton catchment boundary





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Lakes EPP

CALM Managed Land 1997
National Park
Nature Reserve
State Forest

Local Government Authority Boundaries

Cadastral Boundaries

Lake Clifton Catchment Boundary

Department of Environmental Protection, Western Australia

Appendix 2

Water and Rivers Commission sub catchments for the Lake Clifton catchment

Water and Rivers Commission sub catchments for the Lake Clifton catchment