Final criteria of environmental acceptability for land use proposals within the catchment of Lake Clifton

Environmental Protection Authority
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Summary

The purpose of this report is to describe the Environmental Protection Authority's finalised environmental criteria for land use planning on private land within the catchment of Lake Clifton to protect water quality and hydrological balance of the lake.

The criteria were finalised following a eight week public comment period on the draft criteria, which were released in November 1995.

In finalising these criteria, the EPA considered all submissions received and any technical information provided.

Following are the relevant environmental factors taken into account during development of the criteria:

(a) water balance in the Lake Clifton catchment

(b) nutrient loads

(c) regionally significant wetlands

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

These criteria have been developed in consultation with the key government agencies whose approval is required for new developments in the catchment, notably the Western Australian Planning Commission and the Water and Rivers Commission. It is the expectation of the EPA that these agencies will apply these criteria in their decision making. Where the criteria are met, it is unlikely that a significant adverse impact would occur so that formal assessment by the EPA is unlikely.

Appeals

There are no appeal rights associated with this report.

Contents

Appendices

1. Introduction

1.1 Background

Lake Clifton is one of the most environmentally significant wetlands in Western Australia.

Much of the land within the eastern part of the lake is privately owned, and is subject to increasing pressure from development.

The Environmental Protection Authority (EPA) set formal levels of assessment for several proposals near the lake, in response to concerns about possible environmental impacts of development. The EPA concluded that this development pressure would continue, and that a more strategic approach to environmental protection of the lake was needed. Consequently, the EPA developed a set of draft environmental criteria for land use proposals within the catchment of Lake Clifton.

These draft criteria were released as EPA Bulletin 788 in November 1995 (EPA, 1995), for an eight week period of public comment.[1]

This current bulletin presents the finalised criteria, following consideration of the public submissions made to the EPA at that time, and technical information provided.

1.2 Format of this bulletin

Section 1 gives the background of the development of the criteria. Section 2 summarises information about the Lake Clifton catchment. Section 3 describes the environmental factors relevant to development of the criteria. Section 4 presents the final criteria, which are also reproduced in Appendix 3 in a format suitable for copying. Section 5 discusses implementation of the criteria, and Section 6 discusses other issues, such as decisions by the Minister for the Environment, and ongoing review of the criteria.

2. Lake Clifton

2.1 The known environment of Lake Clifton

EPA Bulletin 788 contains extensive information on Lake Clifton, and only a summary of important points is presented here. Thrombolites in the lake were identified as the key environmental element requiring protection.[2]

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;

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[1] The reader should refer to EPA Bulletin 788, Criteria of environmental acceptability for land use proposals within the catchment of Lake Clifton (EPA, 1995) for a detailed discussion of the importance and values of Lake Clifton.

[2] Thrombolites are the biologically produced limestone structures in the lake. Historically they have been called stromatolites. Recent work by Dr Linda Moore has correctly classified them as thrombolites (Moore, 1991).

- 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.

2.2 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.

2.3 Key land uses requiring management

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

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

2.4 The Yalgorup Lakes study

The Water and Rivers Commission are currently carrying out a study of the wetlands in the Yalgorup system called the "Yalgorup Lakes study". It is funded by a grant from the National Landcare Programme.

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.

However, the criteria contained in this bulletin needed 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. Environmental factors

3.1 Relevant environmental factors

The EPA considers that, taking into account the submissions made to it on the draft criteria, the following environmental factors are relevant to the protection of Lake Clifton and new developments within its catchment. These environmental factors form the basis for the revision of the draft criteria, and the formulation of the final criteria described in Section 4.

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.

3.2 Main issues raised in submissions and relevance to environmental factors

The main issues raised in public submissions on the draft criteria all relate to one or more of the above environmental factors. the issues are discussed below.

Lot sizes for special rural developments

Some land owners and developers in the catchment would prefer that lot sizes be allowed down to 2 ha, whereas many of the submissions calling for greater protection of the lake wanted larger minimum lot sizes - at least 10 ha.

The technical work provided by the DEP as an appendix to the draft criteria suggested that a conservative approach should be taken to determining lot sizes for new developments. The conclusion was that a minimum lot size of 5 ha be adopted.

The Western Australian Planning Commission submission noted that while small lot sizes could cause unacceptable impacts on the lake, specifying a flat minimum lot size was not necessary, and the criteria should be more flexible in this regard.

The EPA acknowledges that the planning agencies want a more flexible approach in relation to lot sizes, and this can be achieved by having the *average* lot size for a development is not less than 5 ha.

This would mean that some lots in new developments could be less than 5 ha if other lots in the same development are greater than 5 ha.

This would be acceptable to the EPA provided that:

- the average is applied to all new developments, with each new development maintaining the 5 ha average; and
- planning controls are in place to prevent further subdivision of new lots into smaller lots, reducing the 5 ha average by increments.

Where these planning controls cannot be put in place, all new lots should be at least 5 ha.

Horticulture fertilizer application rates

Agriculture Western Australia advised that, based upon its research findings, higher fertilizer application rates could be used than those recommended in the draft criteria, without causing nutrient export into the lake. Agriculture Western Australia have agreed to help land owners starting up new horticulture operations within the catchment to develop environmentally acceptable plans, to ensure adequate setbacks and to provide for effective nutrient management.

The EPA also notes that restrictions on water availability in the catchment will mean only a small proportion of any lot can be used for horticultural purposes. This means the *net* fertilizer

application rates for the whole property will be far less than that recommended by Agriculture Western Australia, and would probably approach that of land used for dryland grazing or rural/residential purposes.

The EPA believes the fertilizer application rates proposed by Agriculture Western Australia are environmentally acceptable, provided the management measures and restrictions on water abstraction set out in the criteria are applied.

Setbacks/buffer from the lake

Whilst a 200m setback from the lake (as recommended by the Department of Conservation and Land Management (CALM)) would be desirable, it would not be achievable in many places, and would effectively ban subdivision of some lots. However, an alternative approach could be adopted, which would still meet the environmental objectives of a 200m setback.

Setbacks have three main purposes:

- to prohibit land uses, such as stock grazing and building, which could physically damage the wetland and surrounding native vegetation;
- to prevent surface run-off from intensively-used land, such as for horticulture, reaching the lake; and
- to allow soil and native vegetation to remove nutrients and other pollutants from surface and ground water before it reaches the lake.

The objectives of the 200m setback can be largely achieved at a smaller distance (150m) provided other management measure are put in place, the main ones being:

- installation of alternative effluent disposal systems, using special soil/clay mixtures that reduce leaching of nutrients;
- control of human access to the lake; and
- adequate fencing to keep stock out of the vegetated buffer area.

4. Management criteria

4.1 Area of land subject to the criteria

Figure 1 shows the area of land subject to the management criteria and generally co-incides 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.

4.2 The final criteria

In EPA Bulletin 778 the criteria were summarised in point form for ease of use. The final criteria are summarised here in a similar format. For convenience, Appendix 3 reproduces this summary along with a cover page and a copy of Figure 1 on a single A3 sheet. This sheet, when folded in half provides an easy to reproduce booklet for use by local government, land owners, community groups and developers.

1. Horticultural developments

(a) water allocation (based on Water and Rivers Commission sub-catchments (Figure 3 shows sub-catchment boundaries):

- Lake Clifton sub-catchment 2 000 kL/ha/year
- Island Point sub-catchment 750 kL/ha/year
- 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 fertilizer 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 should work together so that new applications for horticultural well licences comply with these criteria, through development of an appropriate farm plan which include the minimum requirements described above; and
- land use management should include soil testing, so that fertilizer application rates can be modified where testing indicates that there is spare phosphorus and nitrogen in the soil.

2. Rural residential developments

- 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 to be 1 500 kL per lot per year;
- conventional septic systems should not be permitted, instead alternative effluent systems using amended soil with high nutrient retaining capacities to treat the effluent 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;
- only 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 fertilizer 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, it should be possible in most cases to avoid the loss of trees 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.*

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 Lakeland Planning Strategy 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.

4. Other proposals

- 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. 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.

5. Implementation of the criteria

These criteria have been developed in consultation with the key government agencies, in particular, those agencies whose approval is required for new developments in the catchment. It is the expectation of the EPA that these agencies will apply these criteria in their decision making. Proposals which meet these criteria are unlikely to have significant effects. Four key decision making agencies have been identified: the Western Australian Planning Commission (WAPC), the two local governments (Shire of Waroona & City of Mandurah), the Water and Rivers Commission (WRC).

The WAPC is developing a Coastal and Lakelands Planning Strategy covering the wetlands in the, so-called, Yalgorup system, including Lake Clifton (refer to Figure 2, which also shows the Yalgorup National Park boundaries). The WAPC has considered the EPA criteria for Lake Clifton and have endorsed its approach. It is expected, therefore, that rural residential developments within the catchment will be dealt with by the Commission consistent with the EPA criteria. Developments which meet the criteria are unlikely to require formal assessment by the EPA.

Agriculture Western Australia and the Water and Rivers Commission (WRC) have also been consulted during the preparation of these criteria. Horticultural developments in the catchment will require well licences, which are issued by the WRC. Prior to seeking a well licence, land owners considering establishing a horticultural activity should consult with Agriculture WA. It is the expectation of the EPA that officers of Agriculture WA would help plan the new development so as to be consistent with these criteria. Similarly, it is expected that the WRC will issue licences consistent with these criteria. Where criteria are met it is unlikely that formal assessment by the EPA would be required.

6. Other issues

6.1 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 policy on the protection of the Lake Clifton catchment.

6.2 Decisions by the Minister for the Environment

In June 1996 the EPA released to the Minister for the Environment reports on two proposed subdivisions in the Lake Clifton catchment (EPA 1996 a & b). A number of public appeals were received on the two proposals, some of which were upheld by the Minister in November 1996, when he found both subdivisions environmentally unacceptable.

The Minister subsequently wrote to the EPA expressing concerns over a number of matters, principally the legal practicality of enforcing proponents' commitments and conditions as recommended by the EPA. The Minister also requested that the EPA consider initiating an EPP for the Lake Clifton catchment, and the other lakes in the Yalgorup National Park.

The EPA has responded to the Minister on these issues, and has modified the criteria to reflect that advice.

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In summary, two points can be made here:

- The Minister was concerned that subdivision conditions could not deal with on-going management of significant environmental issues, for example, water abstraction. The EPA concurs with the Minister, and notes that Town Planning Schemes offer the best planning mechanism to deal with most of the on-going issues. Water abstraction can be managed by the WRC. The EPA believes that all rural/residential developments should have appropriate controls set through the Town Planning Scheme, consistent with these criteria. This was the intention of the Government in introducing changes to both the Environmental and Planning legislation, proclaimed in August 1996.
- The EPA has asked the Department of Environmental Protection to consider including Lake Clifton in the State Groundwater EPP currently being prepared. Irrespective of the need for an EPP, the management criteria for the Lake Clifton catchment needed to be finalised now, so that appropriate planning controls could be put in place to control current development. An EPP can, if necessary, deal with on-going land uses as well as new developments.

7. References

Department of Conservation and Land Management, 1995. Yalgorup National park Management Plan 1995-2005, Management Plan No 29.

Environmental Protection Authority, Criteria of Environmental Acceptability for Land Use Proposals within the Catchment of Lake Clifton, Bulletin 788, November 1995.

Environmental Protection Authority, 1996a, Rural Subdivision of Lots 102-106 and Lot 152, Armstrong Hills Drive, Shire of Waroona, within the Catchment of Lake Clifton, Bulletin 818, June 1996.

Environmental Protection Authority, 1996b. Rural Subdivision of Lot 6 Old Coast Road, City of Mandurah, within the Catchment of Lake Clifton, Bulletin 819, June 1996.

Moore, Linda S. 1991. Lake Clifton - An internationally significant wetland in need of management. Land and Water Research News, 8, p37-41.

Appendix 1

Figures

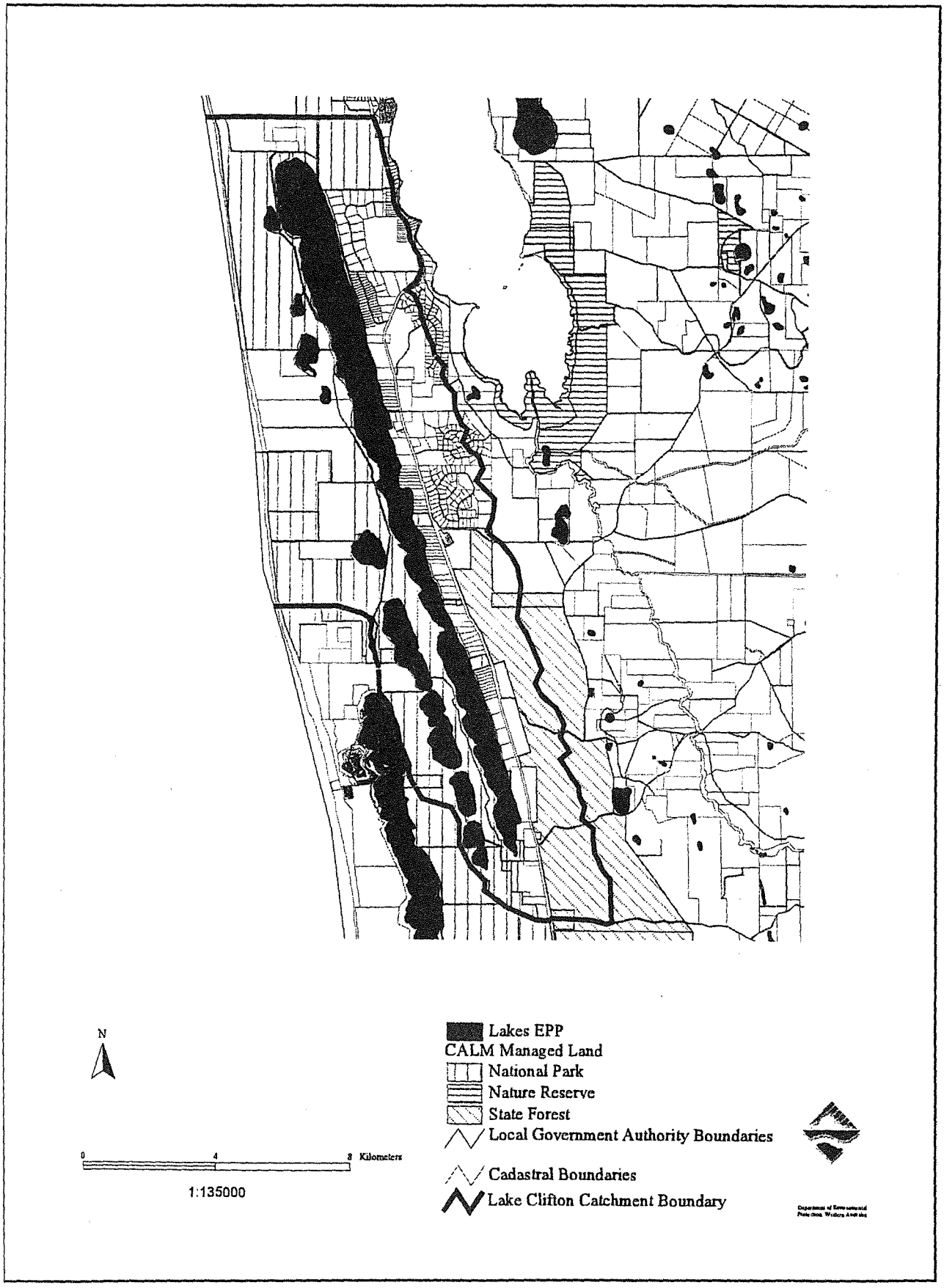

Figure 1. Lake Clifton Catchment Boundary (March 1997).

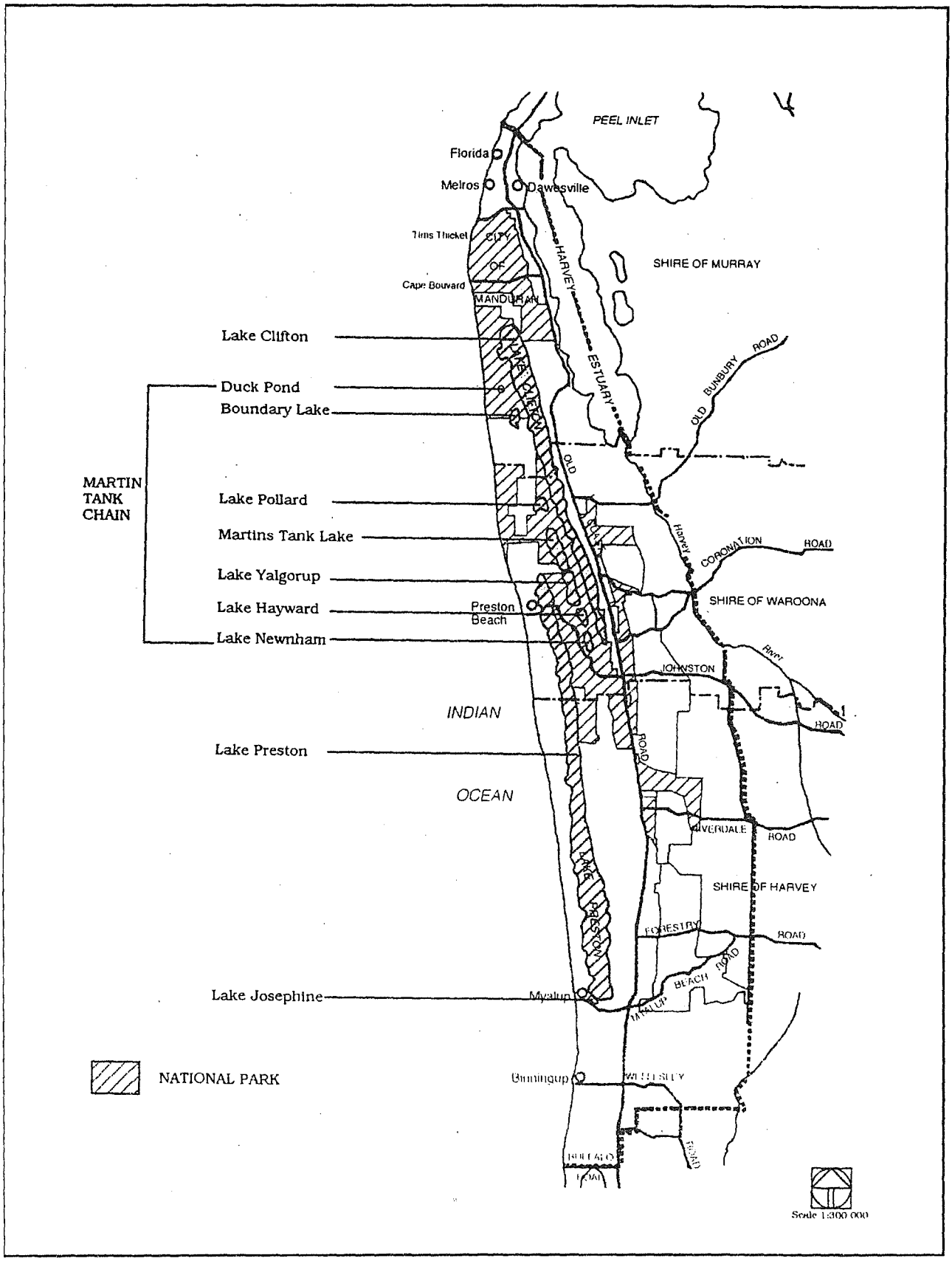

Figure 2. Boundary for the Western Australian Planning Commission's Coastal and Lakeland Strategy, showing the lakes in the Yalgorup system and national park boundaries.

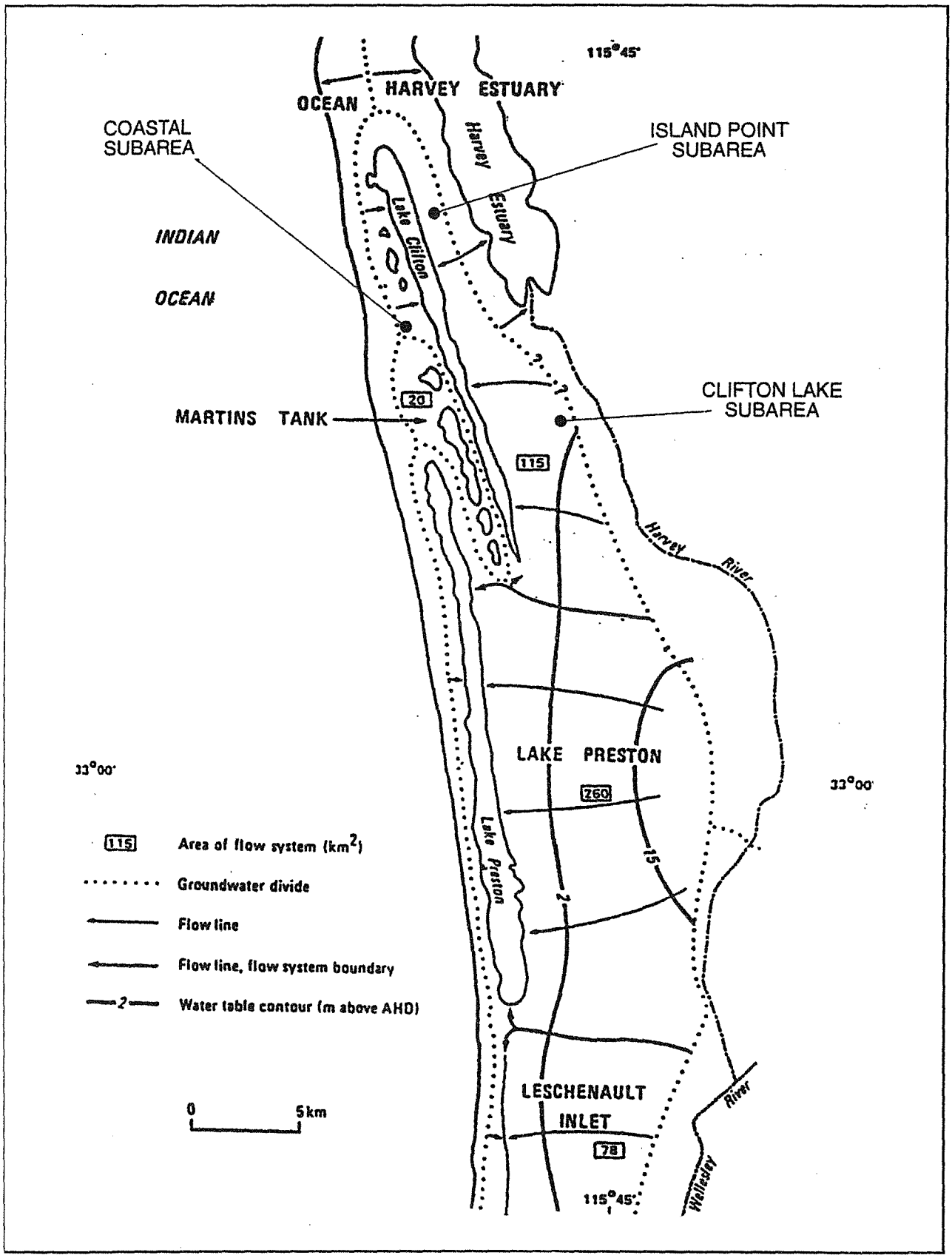

Figure 3. Water and Rivers Commission sub-catchment boundaries for Lake Clifton.

Appendix 2

Individuals and organisations that made submissions

Individuals

Mr Lindsay Stephens
Mrs V Woodland
Mr C Evans
Mr & Mrs Mounsey
Mr & Mrs Kavanagh

Organisations

Ministry for Planning
Water and Rivers Commission
Lake Clifton Conservation Council Inc
BSD Consultants
SJB Town Planners
Agriculture Western Australia
Shire of Waroona
Cape Bouvard Investments Pty Ltd
Yalgorup Lakes NLP Project Committee
City of Mandurah
Gray & Lewis Planning Consultants
Peel Preservation Group (Inc)
Shire of Harvey

Appendix 3

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

THE ENVIRONMENTAL PROTECTION AUTHORITY CRITERIA FOR NEW LAND USE DEVELOPMENTS IN THE CATCHMENT OF LAKE CLIFTON

March 1997

(extract from EPA Bulletin 864)

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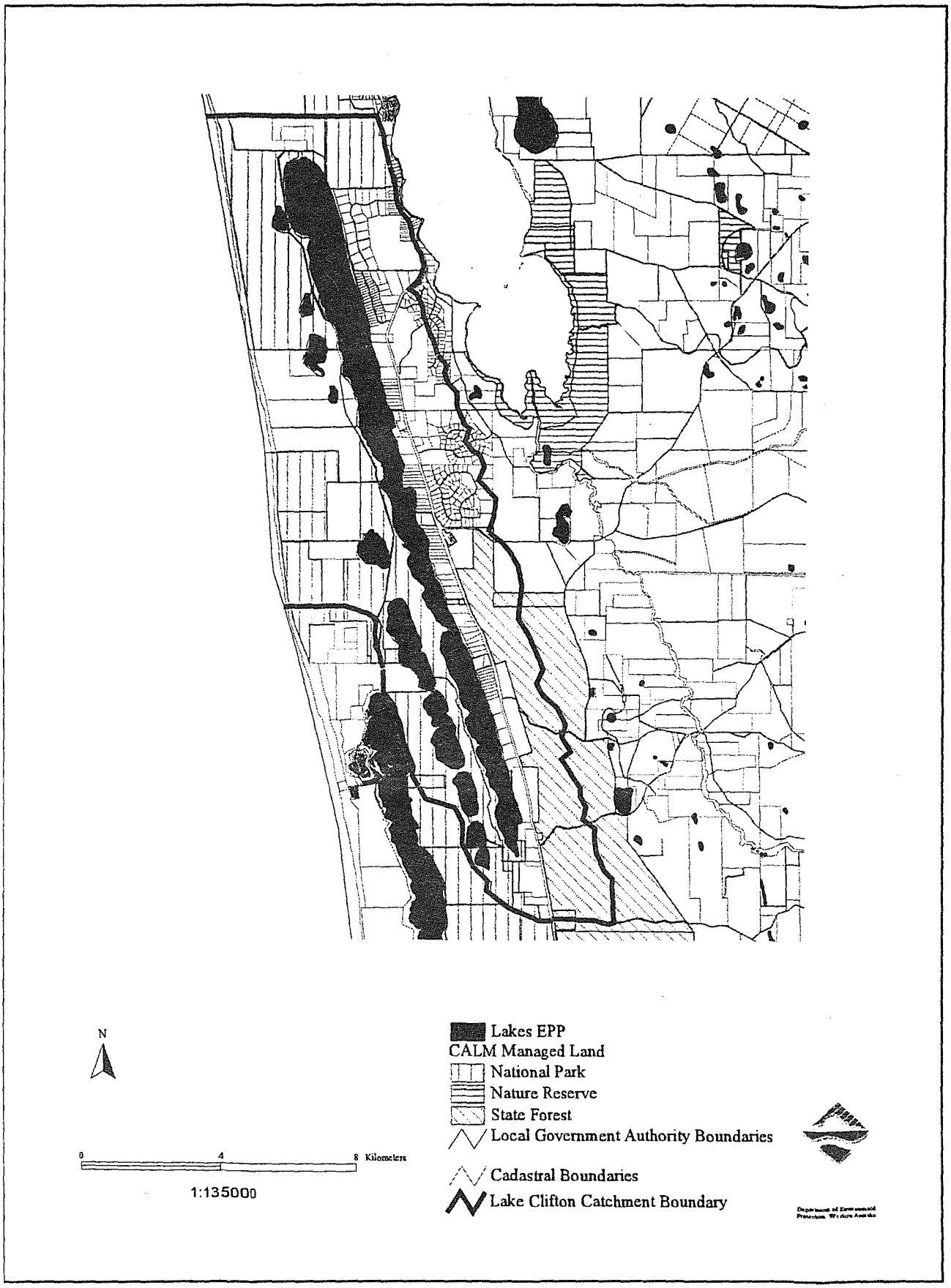

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