Clearing of native vegetation on Kent Location 1766, Needilup Road North and Townsend Road, Shire of Kent

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Mr W O'Halloran

Report and recommendations
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 1000
December 2000

ISBN. 0 7307 6625 X
ISSN. 1030 - 0120
Assessment No.1351

Summary and Recommendations

This report provides the Environmental Protection Authority's (EPA's) advice and recommendations to the Minister for the Environment on the proposal by Mr W O'Halloran (the proponent and landowner) to clear approximately 184 hectares of native vegetation on Kent Location 1766 in the Shire of Kent for agricultural purposes. The proponent has indicated that the purpose for the proposed clearing is for growing wheat, lupins and sheep.

Following consideration by the Inter Agency Working Group under the *Memorandum of Understanding (MOU) for the protection of remnant vegetation on private land in the agricultural region of Western Australia*, the proposal was referred to the EPA by the Commissioner for Soil and Land Conservation advising that a Soil Conservation Notice had been issued as the clearing was likely to cause land degradation, and that the Inter Agency Working Group had advised him there was also a likelihood that regional biodiversity values could be threatened if the land clearing was carried out, including potential impacts on Lake Magenta Nature Reserve.

As the proposal appeared unlikely to meet the EPA's environmental objectives, the Authority set the level of assessment for the proposal at Proposal Unlikely to be Environmentally Acceptable (PUEA) in August 2000. At that time, a brief statement of the reasons for the PUEA level of assessment was made publicly available as set out in the EPA's Administrative Procedures for Environmental Impact Assessment.

This report is the EPA's report to the Minister for the Environment on the proposal pursuant to Section 44 of the Environmental Protection Act 1986.

Relevant environmental factors

In the EPA's opinion, the following are the environmental factors relevant to the proposal, which require detailed evaluation in the report:

(a) Nature conservation and biological diversity – impacts due to the loss of native vegetation;

(b) Land and water degradation – potential for adverse on-site and off-site impacts on land and water resources; and

(c) Greenhouse gas emissions – carbon loss from vegetation clearing and soil.

Conclusions

The EPA has considered the proposal by Mr O'Halloran to clear approximately 184 hectares of native vegetation on Kent Location 1766 for agriculture with reference to the relevant environmental factors.

The EPA considers the proposal is environmentally unacceptable for the reasons set out in Section 3 of this report.

As indicated in the EPA's position statement on the protection of native vegetation, the Environmental Protection Authority has been concerned about the environmental consequences of clearing in the agricultural region for some time and, whilst it appreciates that there are matters of equity to be considered, it holds strongly to the view that from an environmental perspective it is unreasonable to allow further clearing to be undertaken for agricultural purposes.

Furthermore, the EPA advises that, while it will continue to consider and provide advice to the Minister on the environmental factors relevant to proposals for clearing of native vegetation in accordance with the requirements of Part IV of the Environmental Protection Act, any future proposals for agricultural clearing of native vegetation within the agricultural region referred under Section 38 are likely to receive the 'Proposal Unlikely to be Environmentally Acceptable' level of assessment.

Recommendations

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister considers the report on the relevant environmental factors of:
   (a) Nature conservation and biological diversity – impacts due to the loss of native vegetation;
   (b) Land and water degradation – potential for adverse on-site and off-site impacts on land and water degradation; and
   (c) Greenhouse gas emissions – carbon loss from vegetation clearing and soil,

   as set out in Section 3 of this report.
2. That the Minister notes that the EPA has concluded that the proposal cannot meet the EPA's environmental objectives because clearing is likely to lead to the continued loss of nature conservation and biological diversity values of vegetation in the region, and may contribute to land degradation problems.
3. That the Minister not issue a statement that the proposal may be implemented.
4. That the Minister notes the EPA's other advice presented in Section 4 of this report.

Contents

1. Introduction and background

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment on the environmental factors relevant to the proposal by Mr W O'Halloran (the proponent and landowner) to clear approximately 184 hectares of native vegetation on Kent Location 1766 for agriculture. Kent Location 1766 is located 25 km east of Pingrup on the corner of Needilup and Townsend Roads within the Shire of Kent. (Figure 1) The proponent has indicated the purpose of the clearing is for wheat, lupins and sheep.

Under the Soil and Land Conservation Act, any landholder wishing to clear over 1 hectare of native vegetation is required to notify the Commissioner for Soil and Land Conservation (the Commissioner). The Commissioner then decides whether or not to object to the clearing depending on whether or not land degradation is likely to occur and may issue a Soil Conservation Notice to prevent that clearing taking place.

The proponent notified the Commissioner for Soil and Land Conservation of his intention to clear approximately 184 hectares on the subject land in July 1996. The Commissioner determined that the clearing was likely to cause land degradation in the form of salinity and therefore issued a Soil Conservation Notice to prevent the clearing in July 1999. Mr O'Halloran subsequently appealed to the Minister for Primary Industry against the Soil Conservation Notice. The EPA understands that the Minister for Primary Industry has not yet determined the appeal.

The Commissioner for Soil and Land Conservation referred the land clearing proposal to the EPA in October 1999, advising that a Soil Conservation Notice had been issued and that the Inter Agency Working Group had advised him that there was also a likelihood that regional biodiversity values could be threatened if the clearing was carried out, including impacts on the nearby Lake Magenta Nature Reserve.

As the proposal appeared unlikely to meet the EPA's environmental objectives, the Authority set the level of assessment for the proposal at *Proposal Unlikely to be Environmentally Acceptable (PUEA)* in August 2000. At that time a brief statement of the reasons for the PUEA level of assessment was made publicly available as set out in the EPA's Administrative Procedures for Environmental Impact Assessment. There were no appeals against the Level of Assessment.

This report is the EPA's report to the Minister for the Environment on the proposal pursuant to Section 44 of the *Environmental Protection Act 1986.*

2. The proposal

Figure 1 shows the location of the subject land in the south-west of the State and its relation to the agricultural region of the EPA's *Position Statement on the Environmental Protection of Native Vegetation in Western Australia.* The main characteristics of the proposal are summarised in Table 1 below. The area notified for clearing is shown on Figure 2.

Table 1 - Summary of key proposal characteristics

Element	Description
Total area of contiguous property holding	4378 hectares
Area of property uncleared	832 hectares (19%)
Area of native vegetation remaining after proposed clearing	640 hectares (14.6%)
Area of vegetation to be protected under an Agreement to Reserve (ATR)	0 hectares

Purpose of clearing	Growing of wheat, lupins and sheep
Method of disposal of vegetation cleared	Burning
Mapped description of the type of vegetation according to Beard (1972 & 1980)	Medium woodland; salmon gum and gimlet
Total extent of vegetation type remaining in agricultural area	Approximately 36,280 (16%)
Total representation in conservation reserves (IUCN Category I to IV) within a 15 km radius	30% which is largely within the Lake Magenta Nature Reserve

3. Relevant environmental factors

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and the conditions and procedures, if any, to which the proposal should be subject. In addition, the EPA may make recommendations as it sees fit.

It is the EPA's opinion that the following are the environmental factors relevant to the proposal which require detailed evaluation in this report:

- Nature conservation and biological diversity – impacts due to the loss of native vegetation,
- Land and water degradation – potential for adverse on-site and off-site impacts on land and water resources; and
- Greenhouse gas emissions – carbon loss from vegetation clearing and soil.

These relevant factors are discussed in Sections 3.1 to 3.3 of this report.

3.1 Nature conservation and biological diversity

3.1.1 Strategic context

It is now well recognised that broad-scale land clearing and consequential salinity have had a dramatic effect on biodiversity in the agricultural area through the direct loss of vegetation communities and plant species, and the associated loss of mammals, birds and other animals which depend upon large enough areas of healthy bush for food and shelter. These impacts have been reported in both the State and Commonwealth State of the Environment reporting (Western Australian Government, 1998 and Commonwealth of Australia, 1996).

In response to impacts on biological diversity and nature conservation, as well as land and water degradation, the State and Commonwealth Governments have over recent years developed and implemented various policy positions and programmes to provide a strategic context for the protection of remnant native vegetation.

a) State Government position, 1995

The State Government position of 1995 agreed to apply restrictions on clearing and to augment the Commissioner's assessment of clearing applications to ensure that other natural resource

management issues as well as land degradation issues were considered before any further clearing occurred on privately owned land. The position included the following elements:

- Restrict any clearing that would reduce the amount of remnant vegetation or deep-rooted perennial vegetation on any property (contiguous landholding) to below 20% of the original;
- Discourage clearing in any Shire where the total amount of remnant vegetation is less than 20% of the Shire area; and
- Put the onus on to the proponent to demonstrate clearly that clearing would not cause land degradation or threaten nature conservation values.

The target criteria of ensuring that there is a minimum of 20% on individual properties and 20% vegetation retention within the Shire were derived primarily from consideration of land degradation impacts, and did not specifically provide for nature conservation values.

In this regard, for Shires with greater than 20% remnant vegetation, the position provided that the Commissioner for Soil and Land Conservation would decide on the need to refer any proposal to the EPA for consideration of nature conservation values in accordance with an agreed Memorandum of Understanding.

b) State Memorandum of Understanding

The State Government position has been implemented via a Memorandum of Understanding (MoU) signed by the Commissioner for Soil and Land Conservation, the Chairman of the EPA, and the Chief Executive Officers of the Department of Environmental Protection (DEP), Department of Conservation and Land Management (CALM), Water and Rivers Commission (WRC) and Agriculture Western Australia (AgWA). The MoU, which links the Commissioner's Notice of Intent (NOI) to Clear process with the environmental impact assessment process under the Environmental Protection Act 1986 was signed in March 1997. A summary document containing the main elements of the MoU has been published by AgWA (Agriculture WA, 1997).

The MoU provides for a process of coordinating the signatory government agencies in an attempt to ensure that biodiversity and land and water degradation impacts are considered and to streamline the process. The MoU describes four levels of consideration once a Notice of Intent to Clear has been submitted to the Commissioner for Soil and Land Conservation:

Level One	Desktop review. The Commissioner may object on various grounds or may refer the application to Level Two for more detailed investigations.
Level Two	Property Investigation and report. The Commissioner may object because of the potential for land degradation or refer to Level Three for detailed review of biodiversity and other issues.
Level Three	Inter Agency Working Group (IAWG) Review. This level involves a formal meeting of senior agency representatives to advise the Commissioner. Several actions are possible including referring the clearing proposal to the EPA for Level Four assessment.
Level Four	Formal assessment by the EPA. It is the proponent's responsibility to provide any additional information required by the EPA.

c) Other State and Commonwealth strategic initiatives

Since 1995 when the State Government released its position on protection and management of remnant native vegetation on private land in the agricultural region, there have been a number of significant policy and programme initiatives at both State and Commonwealth level which have a bearing on the issue. These include:

- The Natural Strategy for the Conservation of Australia's Biological Diversity, specifically, Objective 7.1 of the strategy commits all State, Territory and Commonwealth Governments by the year 2000 to, among other things;

  "(l) arresting and reversing the decline of remnant vegetation; and

  (k) avoiding or limiting any further broad-scale clearance of native vegetation, consistent with ecologically sustainable management and bio-regional planning, to those instances in which regional biological diversity objectives are not compromised" (Commonwealth of Australia, 1996, p 42).

- The establishment of the Natural Heritage Trust by the Commonwealth Government and its changes of focus from the National Landcare Program which funded work on private land for private benefit, in a more regional context, in particular through the Bushcare initiatives;

- The Commonwealth and WA State of the Environment reports which identified biodiverstiy, clearing and salinity as critical issues;

- The development of the WA Salinity Strategy and formation of a WA State Salinity Council;

- The National Greenhouse Strategy from the Kyoto conference, which encourages the retention of native vegetation as a carbon sink; and

- The final report of the Native Vegetation Working Group (See Section 4).

d) EPA Position

Within the strategic framework provided by the above government policy positions and programmes, the EPA has assessed a number of land clearing proposals in recent years.

Based on these assessments, and a workshop with key personnel from agencies which are signatories to the MoU for protection of native vegetation, in December 1999 the EPA released a preliminary Position Statement *Environmental Protection of Native Vegetation in Western Australia.* The EPA released the final Position Statement in December 2000 following input from conservation groups, government agencies and individual members of the public (EPA, 2000).

Specifically in relation to the agricultural region, the EPA's current position on clearing includes the following:

- Significant clearing of native vegetation has already occurred on agricultural land, and this has led to a reduction in biodiversity and increase in land salinisation. Accordingly, from an environmental perspective any further reduction in native vegetation through clearing for agriculture cannot be supported.

- All existing remnant native vegetation should be protected from passive clearing through, for example, grazing by stock or clearing by other means such as use of chemicals including fertilisers.

- All existing remnant native vegetation should be actively managed by landholders and managers to as to maintain environmental values.

- Because of the extent of over-clearing in the agricultural area, development of revegetation strategies at a landscape level, including provision of stepping stones, linkages and corridors of native vegetation, should be a priority.

- Clearing of deep-rooted native vegetation for replacement with non-native deep-rooted crops (eg *Tagasaste* or blue gums) is not generally regarded as acceptable environmentally and these alternative deep-rooted crops should be planted on already cleared land.

The EPA recognises that its position extends beyond the State Government position of 1995 which removed the presumed right to clear native vegetation in landscapes containing less than 20% of the original vegetation. The criterion of 20% vegetation related primarily to land degradation impacts and does not adequately provide for nature conservation and biological diversity considerations. Understanding of the need to protect remnant vegetation for conservation and biological diversity values has advanced since the 1995 State Government position as reflected in the policy and strategy initiatives listed in the dot points above.

The EPA recognises that Mr O'Halloran's clearing proposal is within the Shire of Kent which has 27% native vegetation. However, only small remnants of this vegetation type are located in private land within the Shire and, in addition, the Lake Chinocup Catchment is subject to considerable land degradation in the form of salinity.

The Lake Chinocup Catchment is a focus recovery catchment which has experienced extensive salinisation in recent years. It has received considerable Natural Heritage Trust funds with substantial replanting and reseeding taking place to try to arrest salinity. It is recognised that, even with cessation of land clearing in the Avon Catchment, of which the subject land is part, salinity will increase to around 30% of the land (Avon Working Group, 2000).

The area has been included in the agricultural region defined in the EPA's *Position Statement on Environmental Protection of Native Vegetation in Western Australia* (EPA, 2000) where it does not support further agricultural clearing from an agricultural perspective.

In accordance with this position, the EPA considers that the clearing proposed in this NOI to clear should not be permitted. The challenge is to consider a response to the issue of equity rather than permit further clearing.

3.1.2 Property specific considerations

The proposed clearing was evaluated by officers from AgWA, DEP, CALM and WRC in accordance with the principles and criteria set out in the MoU for protection of native vegetation.

The EPA notes that no specific surveys have been carried out for Declared Rare or Priority Flora species within the vegetation proposed to be cleared. However, advice provided by CALM indicates that four priority flora species occur in the nearby area. *Eucalyptus clivicola* is found nearby on Needilup Road and usually grows on lateritic ridges and slopes, *Bossiaea divaricata* is found just north on the edge of Lake Magenta Nature Reserve on sandy laterite slopes and *Grevillea newbeyi* is also found in the general area on sandy laterite. One Priority species, not named, is found in salt flat habitat. Concern was also expressed by CALM at the proposed clearing across the top of several drainage lines. Since most of the clearing is proposed for the lateritic areas on the property, there is a possibility that these species are likely to occur on Location 1766.

No specific survey of the vegetation has been carried out. Based on regional mapping, the vegetation in the property falls within the 'Medium woodland; salmon gum and gimlet' vegetation type (Beard 1972 & 1980). Within the whole agricultural area, the original extent of this vegetation has been estimated to be 223, 000 hectares. Of this amount, only 36,280 hectares (16%) remains. Analysis of this vegetation type within a 15 km radius of the property by the DEP using a Geographical Information System (GIS), reveals that 584.6 hectares remains on private land.

Further analysis of the representation of this vegetation type in secure conservation reserves within a 15 km radius indicates that a large proportion (51%) of the original extent is located in

the Lake Magenta Nature Reserve (Figure 3). Evidence is now emerging that this reserve is increasingly being affected by salinity.

The EPA notes that the Beard mapping is of a broad nature and that little information is known regarding the vegetation proposed to be cleared, or vegetation in the general region, at a plant community level. It is therefore not possible to conclude that the vegetation proposed to be cleared is adequately represented in the region.

The EPA notes that the native vegetation currently remaining on the property is of a large compact shape which should maintain its viability in providing fauna corridor values as 'stepping stones' to Lake Magenta Nature Reserve. The proposed clearing would significantly reduce the size, and increase the boundary of this large 502 hectare block of vegetation.

In its advice to the Minister for the Environment on issues arising from use of Section 38 to assess clearing proposals (EPA, 1999a) the EPA drew attention to the difficulties presented to the Authority as a result of the limited detailed information which was generally available to it to assess individual proposals. In this case again, there is limited specific information regarding the vegetation proposed to be cleared or other vegetation in the region. The proponent has not provided adequate information on the vegetation to support his proposal to clear.

However, based on the information which is available, and adopting a precautionary approach, the EPA considers that the further clearing proposed on Location 1766 would be likely to continue the loss of nature conservation and biological diversity valued of vegetation in the region, and should not be permitted.

3.2 Land and water degradation

3.2.1 Strategic context

Land degradation caused by erosion, salinisation, waterlogging and acidification were key issues identified for action by the Government in Western Australia's *State of the Environment Report* (WA Government 1998) and the *Salinity Strategy* (WA Government 2000). Native vegetation management has been identified in the *Salinity Strategy* as an important tool to assist in the management of these threats.

Additionally, the EPA has expressed the view in its Position Statement on the protection of native vegetation (EPA, 2000) that:

"Clearing and consequential salinity are having a devastating effect on biodiversity through the direct loss of plant species, and the associated loss of mammals, birds and other animals which depend upon large enough areas of healthy bush for food and shelter. Many of the remaining areas of native vegetation in the wheatbelt are small islands surrounded by farmed land, and the fauna are unable to move to other areas when they are too far apart and not linked by 'stepping stones' or corridors.

The Environmental Protection Authority has been concerned about the environmental consequences of clearing in the agricultural region for some time and, whilst it appreciates that there are matters of equity to be considered, it holds strongly to the view that from an environmental perspective, it is unreasonable to allow further clearing to be undertaken for agricultural purposes."

3.2.2 Property specific considerations

The Commissioner for Soil and Land Conservation requested a hydrological assessment be carried out on the property to determine the impacts both on and off site as a result of the proposed clearing. This was conducted by an Agriculture WA research hydrologist and concluded that further clearing within the catchment, particularly on high recharge areas as proposed will increase the overall water imbalance and increase the risk of offsite land degradation.

The Agriculture WA hydrologist advice noted that the area proposed for clearing is underlain by laterite surrounded by reworked sandplain that drains to the ancient drainage flats. The lateritic areas have a low water holding capacity increasing the risk of runoff and recharge. It was determined from a field inspection of the catchment that secondary salinity is likely to occur at the break of slope and along the main drainage line due to additional water from clearing for agriculture within the catchment.

The hydrology advice also noted that several degradation issues exist on site including wind erosion and sheet soil erosion and that contour banks on site contain saline water due to seepage from underlying bedrock and further clearing could aggravate the problem.

The Commissioner for Soil and Land Conservation objected to all of the proposed clearing and a Soil Conservation Notice was issued in July 1999. The Commissioner informed the proponent that the purpose of the Soil Conservation Notice was to protect those areas notified within Kent Location 1766 which, if cleared, would likely cause land degradation in the form of salinity.

3.2.3 EPA Assessment

The EPA notes that the subject land is located within the extreme southern headwaters of the Avon Catchment (Figure 4). The Avon Working Group recently released the draft *Avon River Basin:Natural Resource Management Plan*, which recognises that the whole of the catchment has to be managed so that the use of natural diversity becomes more sustainable. Managing hydrological processes is a key objective of the management plan and it is recognised that, even with cessation of land clearing in the catchment, salinity will increase to around 30% of the land.

Within the Avon Catchment, Location 1766 is partially located in the Lake Chinocup Catchment with the remnant vegetation being fully located within the sub-catchment Chook Run (Figures 5 & 6). The Lake Chinocup Catchment is a focus recovery catchment which has experienced extensive land salinisation in recent years. It has been the focus of considerable Natural Heritage Trust funds with substantial replanting and reseeding taking place to arrest salinity.

Since 1996, 666,000 trees have been planted in the catchment (Lake Chinocup Catchment Resource Management Committee, 1999) with over $1.4 million allocated to revegetation and fencing. A piezometer programme has been established with a $42,000 Natural Heritage Trust (NHT) grant to monitor the groundwater. Over 100,000 oil mallees and alternatives such as lucerne, canola and balansa clovers crops have been planted to lower the water table while structural works such as surface water control banks and applications of gypsum are being used to reduce water logging.

Strategic windbreaks have been planted, seed banks have been established and flora surveys have been carried out. The commitment to addressing the salinity in this catchment is demonstrated by the appointment of a full-time Landcare Coordinator since 1995.

The Lake Chinocup Catchment Resource Management Committee commissioned the CSIRO to undertake a hydrological review and modelling of the long-term synopsis of the catchment. Informal reports of the analysis at an interim stage suggest Lake Chinocup Reserve and all other wetlands and remnant vegetation in the catchment will be subject to extensive impacts from rising saline groundwater levels.

Location 1766 is also located within the area covered by the *Environmental Protection (Swan and Canning Rivers) Policy 1997* which recognises that damaging or clearing native vegetation can cause waterways and catchments to be degraded (Figure 5).

The EPA is aware that all Australian Governments have committed themselves through the Bush Heritage Trust to achieving the national goal of reversing the long term decline in the quality and extent of Australia's native vegetation cover by the year 2001. The EPA considers that allowing clearing within a sub-catchment in which considerable effort and funds are being expended in revegetation initiatives would conflict with the aims of this commitment.

The EPA recognises that the proponent has proposed management measures such as interceptor banks, fencing of creek lines and tree planting. The EPA considers, however, that these

measures will be required to assist in slowing the onset of existing salinity in the catchment and could not possibly prevent salinity nor stop the increased water recharge caused by the proposed clearing.

Overall the EPA considers that the subject clearing would exacerbate land degradation in an already highly stressed catchment and would undermine the effect of other revegetation efforts in the catchment. The EPA therefore considers that the proposed clearing should not be permitted.

3.3 Greenhouse gas emissions

3.3.1 Discussion

The clearing and burning of approximately 184 hectares of native vegetation will lead to the emission of greenhouse gases including carbon dioxide.

The prediction of the exact amount of greenhouse gas emissions attributable to a specific proposal for a land use change from native vegetation to agriculture is complex and involves the estimation of emissions from the above ground biomass to be removed, decay of surface and subterranean material such as tree roots, emissions from the soil profile, the long term carbon sink effect of vegetation retention and carbon fluxes generated by agricultural activities such as grazing.

The National Greenhouse Gas Inventory Committee (NGGIC) has developed a simplified methodology for calculating greenhouse gas emissions from clearing in order to assist land managers and decision making agencies in broadly assessing the effects of land management and development. These are discussed in the booklet *Land Use Change and Forestry: Workbook for Carbon Dioxide from the Biosphere* (Environment Australia, 1997).

By adapting the methodology outlined in the NGGIC workbook, and making the assumption that essentially all of the above ground biomass from clearing will be burned or otherwise converted into greenhouse gases within a ten year period following clearing, the DEP estimated that approximately 2650 tonnes of carbon would be emitted from the initial clearing of the native vegetation on Location 1766, a further 2134 tonnes over a ten year period, and 3680 tonnes lost from the soil over a 20 year period. An approximation of the potential carbon emissions from clearing (which excludes the effect of change in land use) was therefore given as 6624 tonnes (Appendix 3).

3.3.2 EPA Assessment

The EPA is aware of the commitment made by Australia under the Kyoto protocol to ensure that greenhouse gas emissions do not increase by more than 8% over 1990 levels for the first reporting period of 2008 to 2012. The EPA is also aware that Australia will be reporting in 2005 on progress towards meeting that target. The National Greenhouse Strategy also encourages the retention of native vegetation as a carbon sink.

While the EPA does not have a specific objective for the assessment of land clearing proposals in terms of levels of greenhouse gas emissions which are acceptable, the clearing of vegetation under the present proposal will not assist in meeting Australia's greenhouse targets.

4. Other Advice

4.1 Final report of the Native Vegetation Working Group

The Working Group was established by the Minister for Primary Industry to 'develop mechanisms that minimise the economic burden carried by individual landholders in the protection and retention of privately owned bushland in agricultural areas'. The Working Group reported in January 2000 (Western Australian Government, 2000b).

In the report introduction, the Working Group set out that:

"Most of Western Australia's farmland has been cleared and developed in the past 100 years. We have now reached the limit of expansion, and there is now a high level of agreement across the community, rural and urban, that the time of broadacre clearing has passed. Amongst the challenges facing us is to determine a useful and well supported future of bushland in our farming area. Indeed, unless there is a substantial increase in tree and bush cover many of the farms established in the last hundred years may fall victim to increasing salinity."

The Report discusses a range of mechanisms aimed at both assisting in the protection and management of bushland, and ensuring that the costs are spread more equitably across the whole community. The Working Group put forward fifteen recommendations.

The EPA commends the Working Group on its report on mechanisms and encourages government to give active consideration to the recommendations (Western Australian Government 2000b).

As noted in the EPA's recent advice to the Minister for the Environment on environmental issues arising from the assessment of individual land clearing proposals (EPA, 1999), "the challenge now is to establish a response to these applications in terms of addressing the equity issue rather continuing to allow clearing". The EPA sees the Working Group's report and recommendations as clearly progressing this issue.

5. Conclusions

The EPA has considered the proposal by Mr O'Halloran to clear approximately 184 hectares of native vegetation on Kent Location 1766 for agriculture with reference to the relevant environmental factors.

The EPA considers the proposal is environmentally unacceptable for the reasons set out in Section 3 of this report.

As indicated in the EPA's position statement on the protection of native vegetation, the Environmental Protection Authority has been concerned about the environmental consequences of land clearing in the agricultural region for some time and, whilst it appreciates that there are matters of equity to be considered, it holds strongly to the view that from an environmental perspective it is unreasonable to allow further clearing to be undertaken for agricultural purposes.

6. Recommendations

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister considers the report on the relevant environmental factors of:
   (a) nature conservation and biological diversity;
   (b) land and water degradation; and
   (c) greenhouse gas emissions,
   as set out in Section 3 of this report.
2. That the Minister notes that the EPA has concluded that the vegetation proposed to be cleared should be retained because clearing is likely to lead to the continued loss of nature conservation and biological diversity values of vegetation in the region, and may contribute to land degradation problems.
3. That the Minister not issue a statement that the proposal may be implemented.
4. That the Minister notes the advice presented in Section 4 of this report.

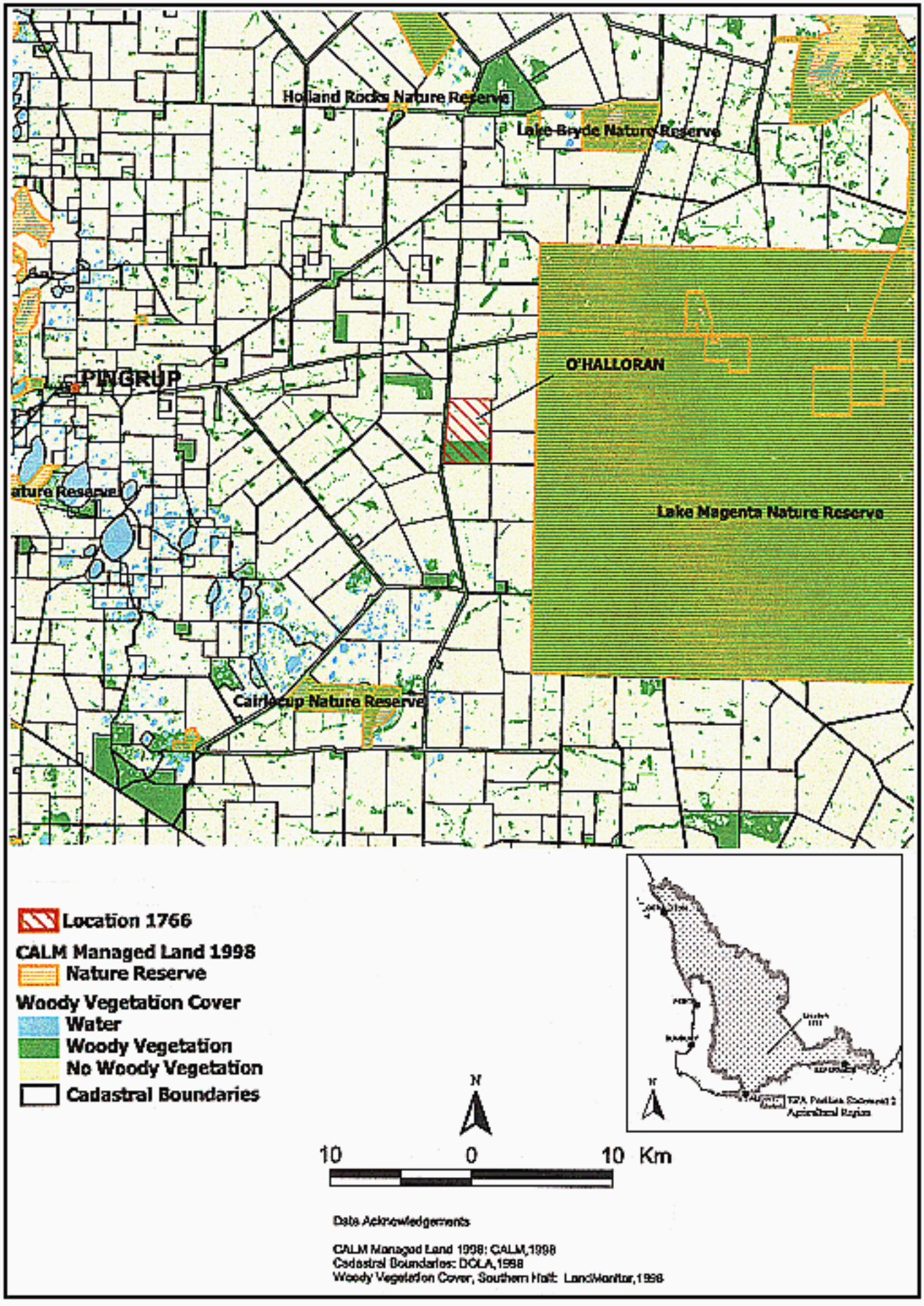

Figure 1. Location of the proposal.

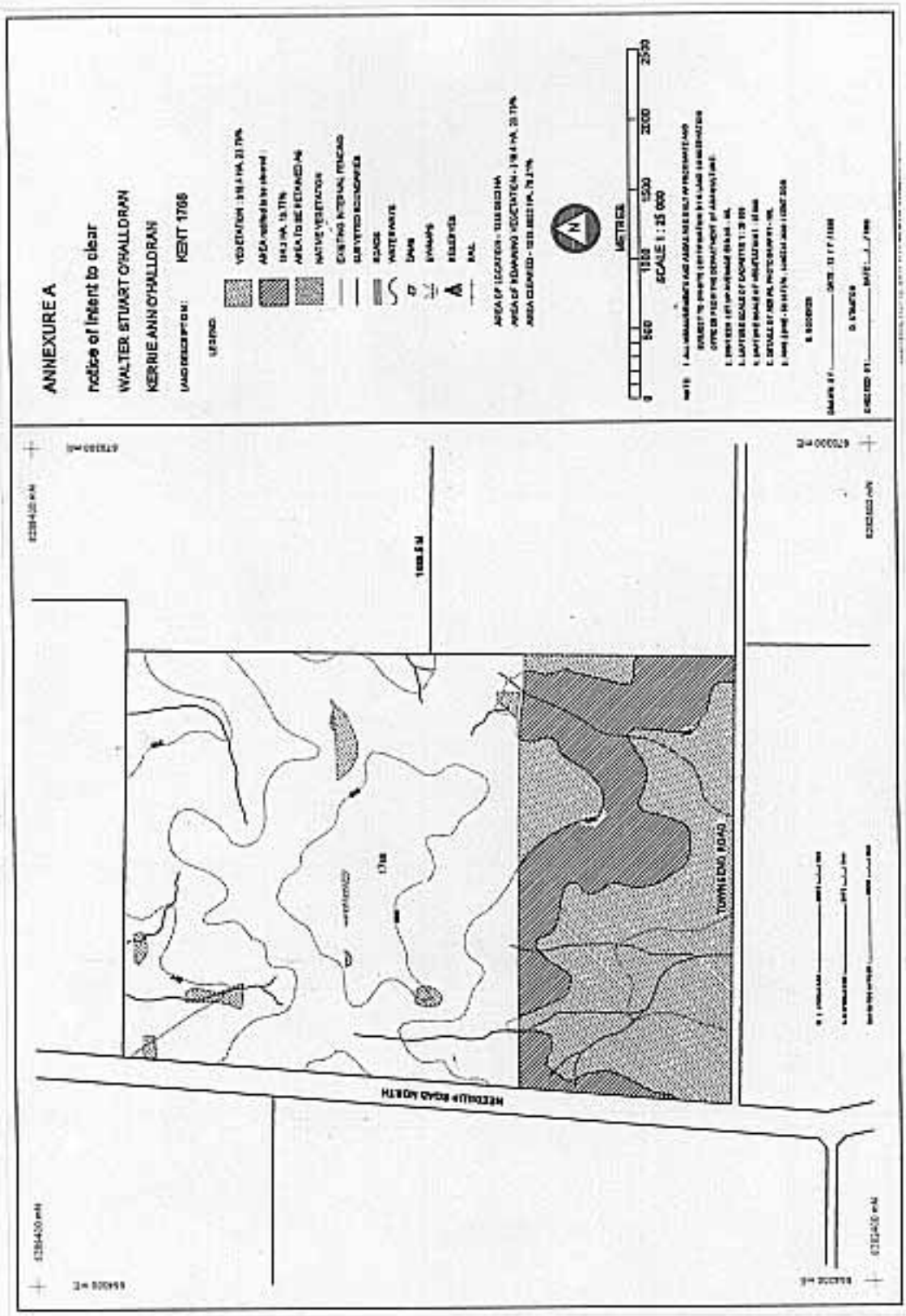

Figure 2. Notice of intent to clear on Kent Location 1766.

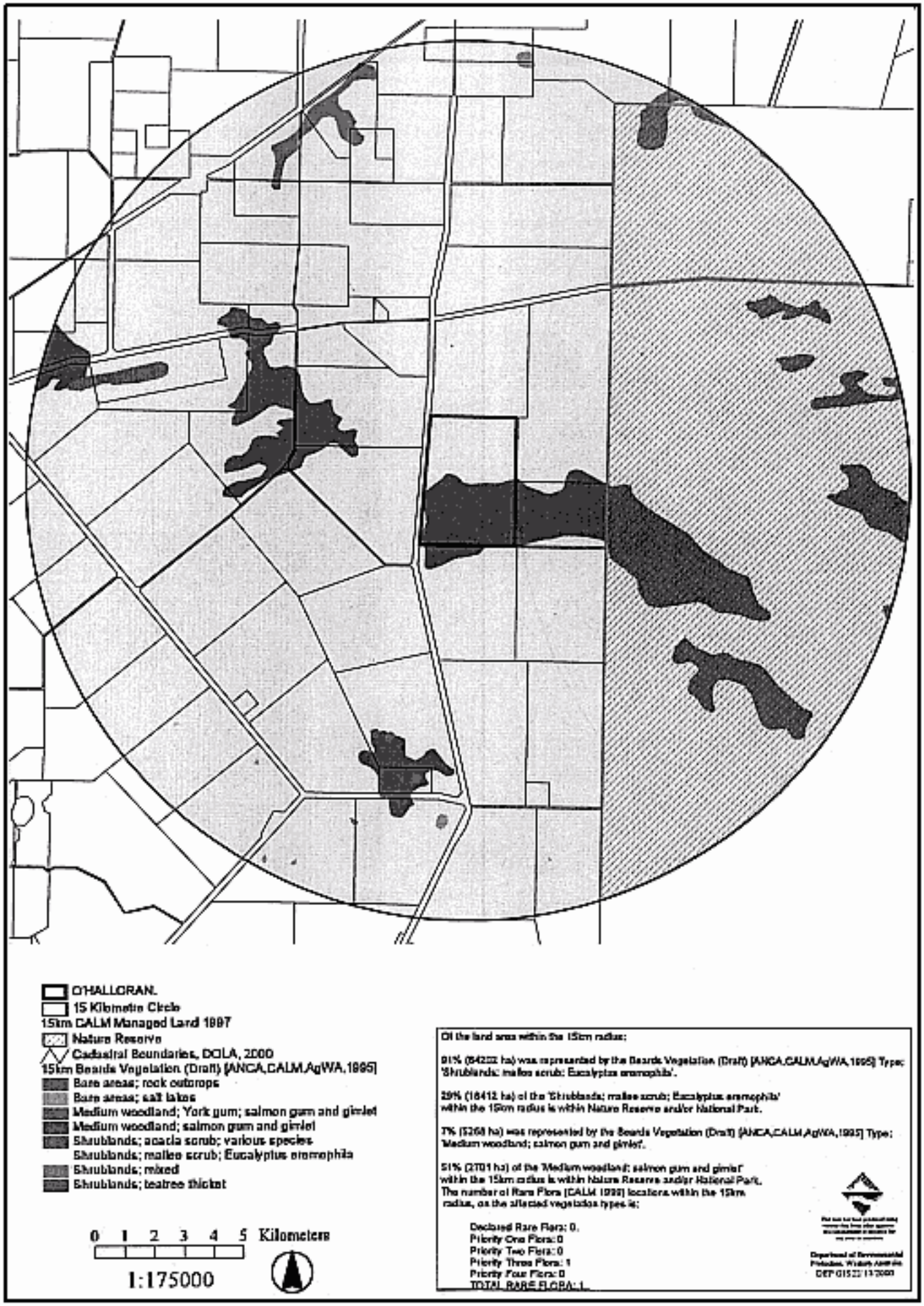

Figure 3. Analysis of vegetation within a 15 km radius of Kent Location 1766.

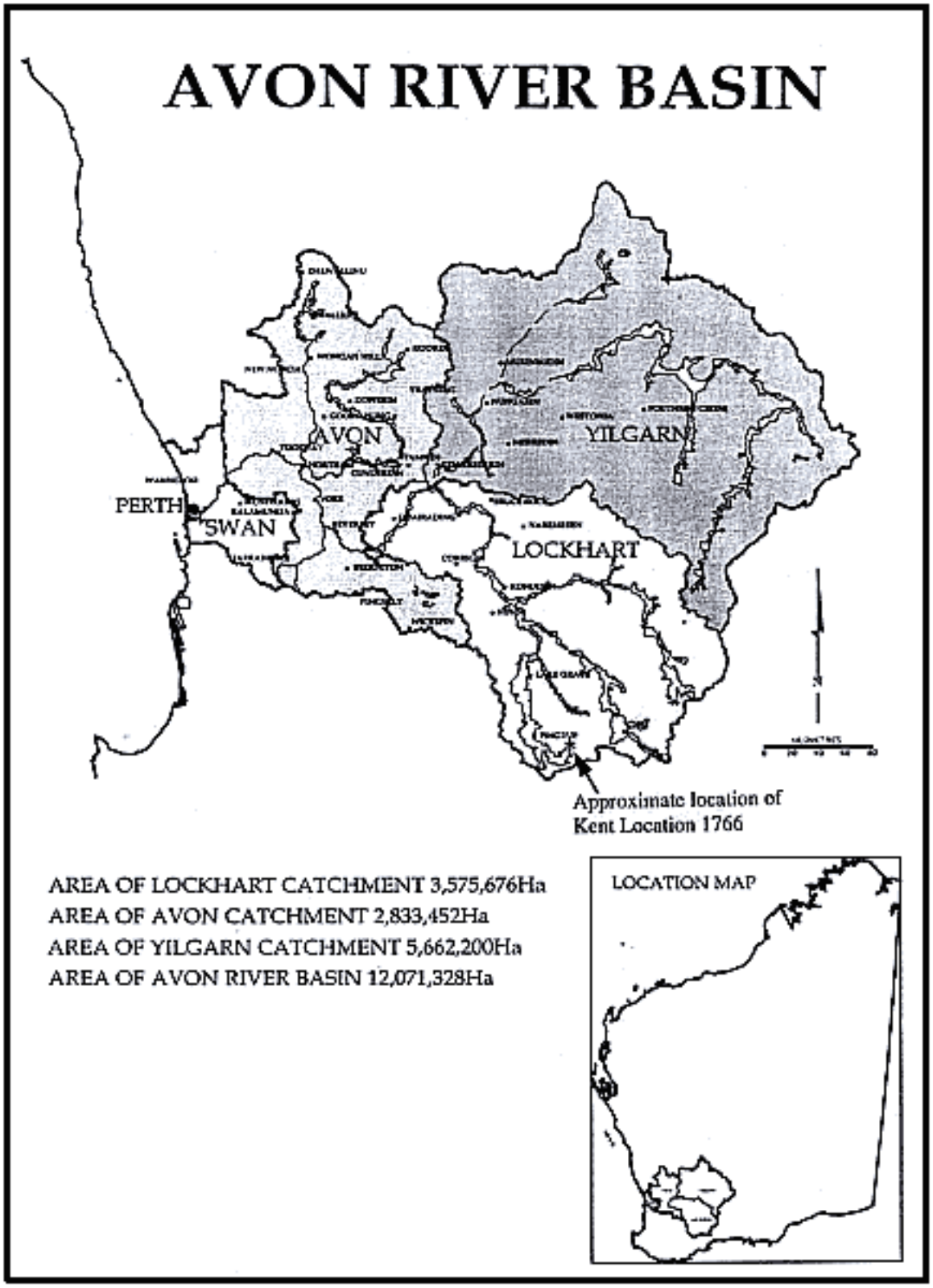

Figure 4. Avon River Basin.

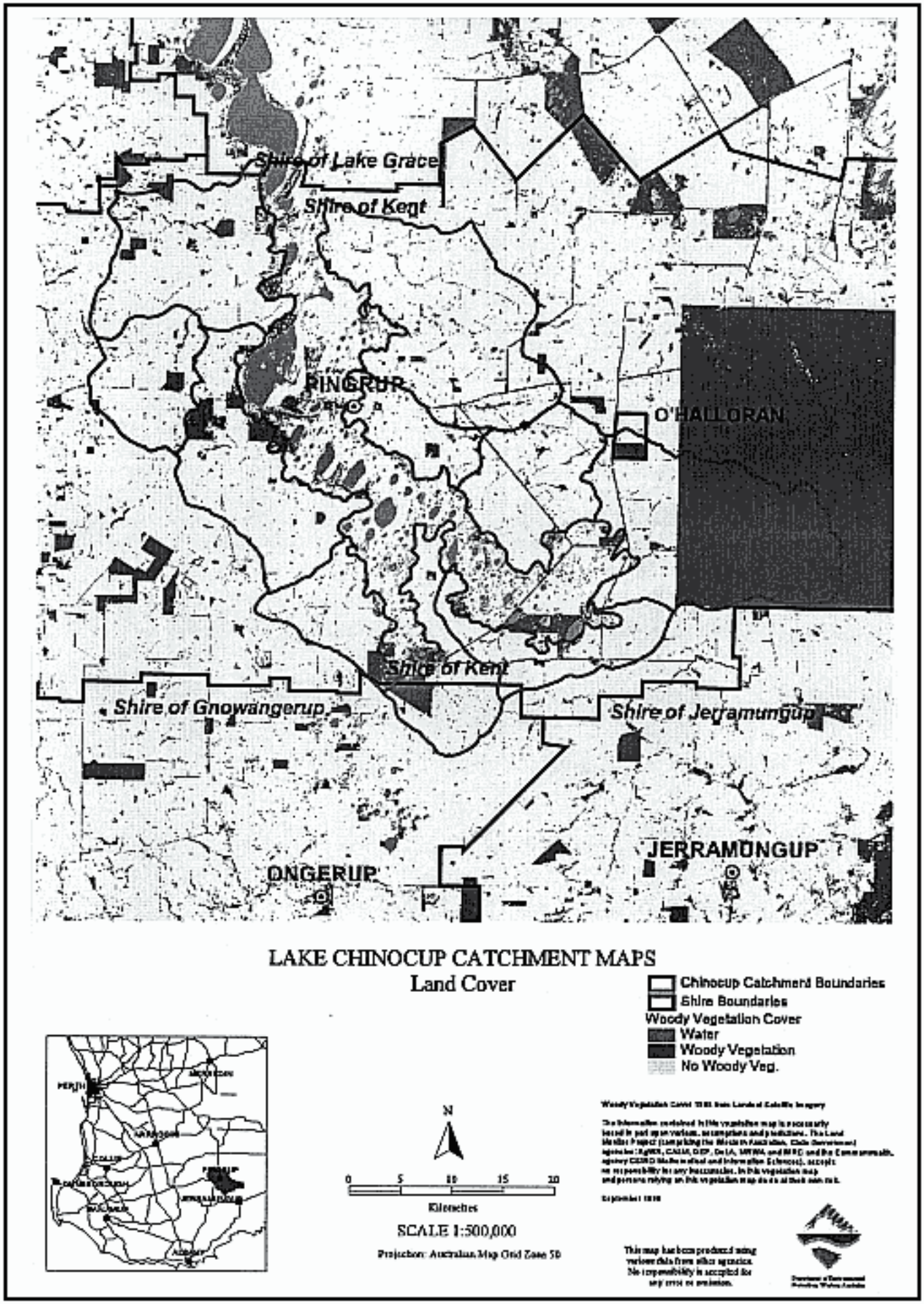

Figure 5. Lake Chinocup Catchment showing remnant vegetation.

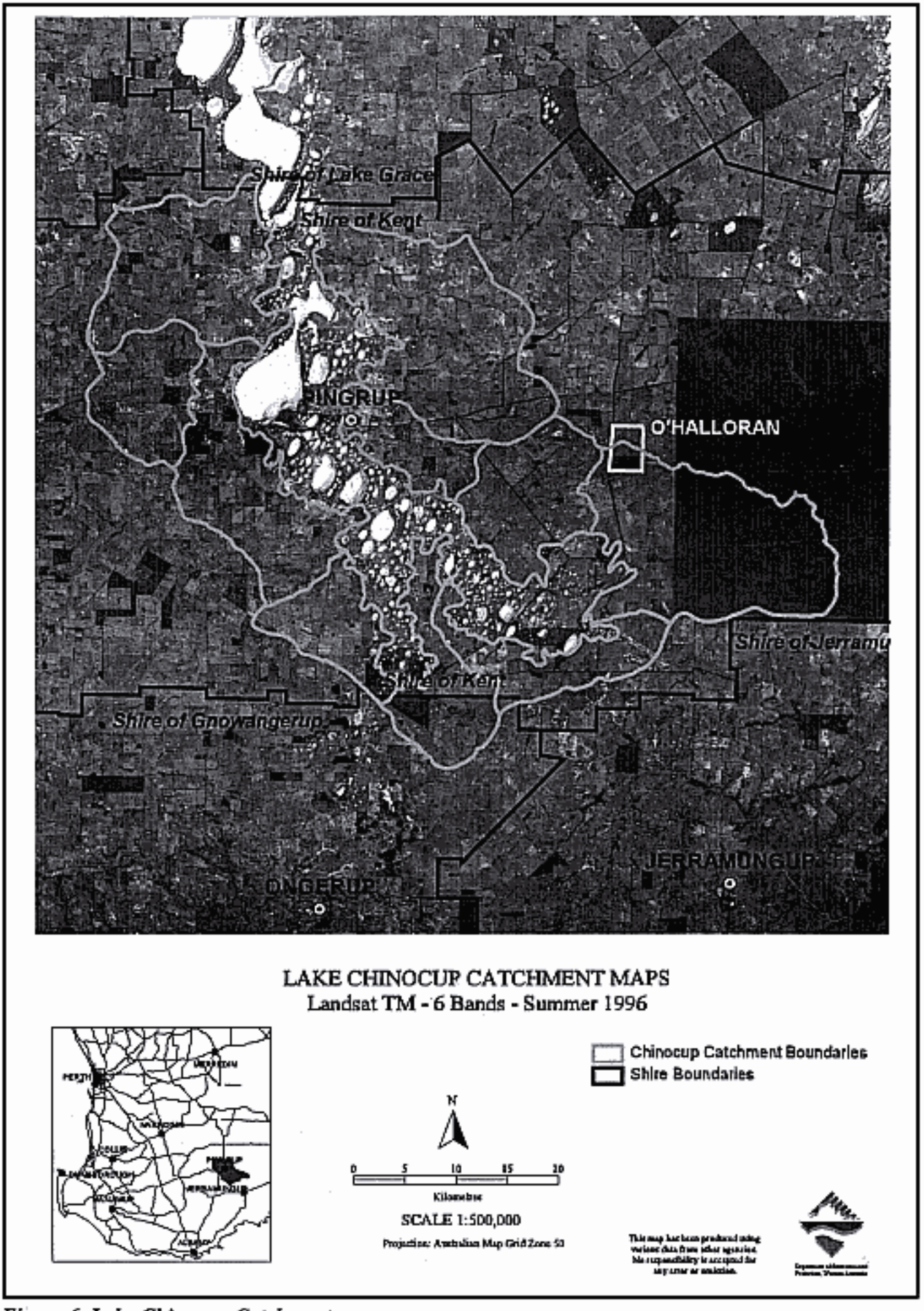

Figure 6. Lake Chinocup Catchment.

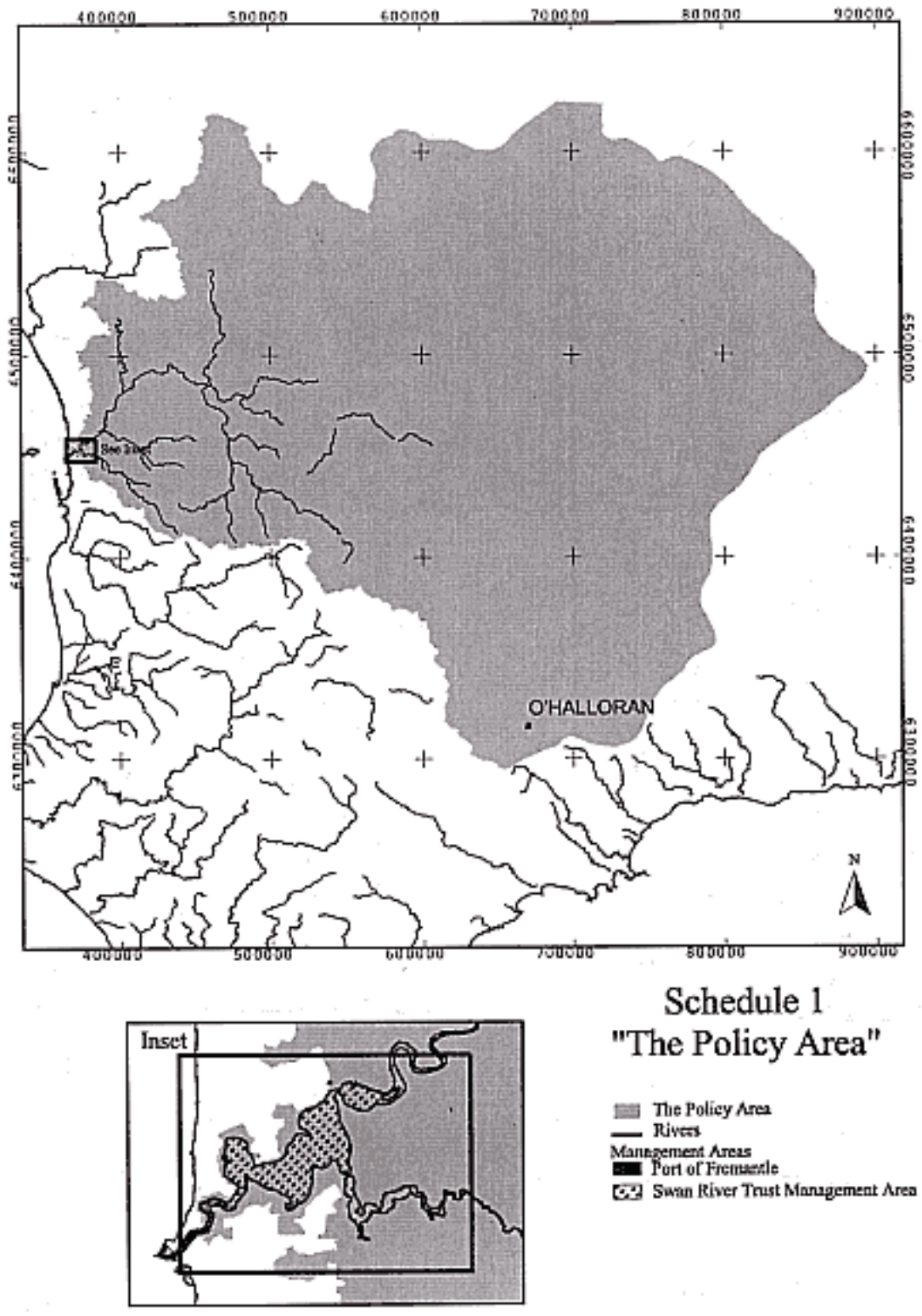

Figure 7. Environmental Protection (Swan & Canning Rivers) Policy 1997.

Appendix 1

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Appendix 2

Public statement of reasons for the PUEA level of assessment

Environmental Protection Authority

Statement of reasons for level of assessment set at 'Proposal Unlikely to be Environmentally Acceptable (PUEA)'

Proposal: Clearing of approximately 184 hectares of land for agriculture – wheat/lupins/sheep

Location: Kent Location 1766, corner Needilup Road and Townsend Road, Shire of Kent.

Proponent: Landowner, Mr O'Halloran

Description of proposal and location:

The proponent and landowner, Mr W O'Halloran proposes to clear approximately 184 hectares of native vegetation on the Townsend Block, one of his farming properties, Kent Location1766. The subject land is located 25 km east of Pingrup, Shire of Kent. Location 1766 is one of four farming properties owned by Mr O'Halloran in the immediate vicinity. See Attachment A.

The Shire of Kent has 27% remnant native vegetation. Most of this vegetation is in Lake Magenta Nature Reserve with only small remnants on private land. The proposed clearing would leave 640 ha (14.6%) native vegetation on the 4378 hectares contiguous holdings of Mr O'Halloran. Currently 832 ha (19%) is native vegetation and 3546 ha (81%) is cleared.

Location 1766 is located partially within the Lake Chinocup Catchment with the remnant vegetation being fully located within the sub-catchment Chook Run. See Attachment B.

It is proposed to dispose of the cleared vegetation by burning.

Soil description and land degradation

The area proposed for clearing is predominantly sandy loam soils underlain by laterite. It is a high recharge area and water will move offsite towards the main drainage line. Secondary salinity is likely to occur at the break of slope and along the main drainage line due to additional water from clearing for agriculture within the catchment.

The Lake Chinocup Catchment (Attachment B & C) is a focus recovery catchment which has experienced a massive outbreak of salinity in recent years. It forms the extreme southern headwaters of the Avon Catchment (see Attachment D). The Avon Working Group recently released the draft *Avon River Basin: Natural Resource Management Plan*, which recognises that the whole of the catchment has to be managed so that the use of natural diversity becomes more sustainable. Managing hydrological processes is a key objective of the management plan and it is recognised that, even with cessation of land clearing in the catchment, salinity will increase to around 30% of the land.

The subject property is located within the *Environmental Protection (Swan and Canning Rivers) Policy 1997* which recognises that damaging or clearing native vegetation can cause waterways and catchments to be degraded. See Attachment E.

The Lake Chinocup Catchment has been the focus of considerable Natural Heritage Trust funds with substantial replanting and reseeding taking place to try to arrest salinity. At least $750,000 has been spent in the catchment on matters such as groundwater monitoring, strategic tree planting, fencing, establishing seed banks and flora surveys.

The Lake Chinocup Catchment Resource Management Committee commissioned the CSIRO to undertake a hydrological review and modelling of long-term synopsis of the catchment. Informal reports of the analysis at an interim stage suggest the outlook for the Lake Chinicup Reserve and all other wetlands and remnant vegetation in the catchment are extremely grave.

Management measures proposed by the proponent including interceptor banks, fencing of creek lines and tree planting will be required to assist in slowing the onset of salinity in the catchment. The measures will not be able to stop the increased water recharge on the proposed cleared areas and will be totally inadequate to slow or prevent salinity caused by the proposed clearing.

There are also several land degradation issues on site including wind erosion and sheet soil erosion. It is considered that further clearing within the catchment, on high recharge areas, will increase the overall water balance and increase the risk of offsite land degradation.

The Commissioner for Soil and Land Conservation objected to all of the clearing on 26 September 1996 and a Soil Conservation Notice was issued on 5 July 1999.

Vegetation description and biodiversity significance

The vegetation on the property was mapped by Beard (1972 and 1980) as complex 'Medium woodland; salmon gum and gimlet.' Within the whole agricultural area, only 16% of this complex remains. Within a 15 km radius, a large proportion is represented in and protected by the Lake Magenta Nature Reserve, however, evidence is emerging that this reserve is itself being affected by salinity.

The remnant vegetation on Location 1766 is a very important outlier of the Lake Magenta Nature Reserve and provides a stepping stone to other remnants of native vegetation on private property within the area. It has major biodiversity values.

Four priority species occur in the vicinity with three occurring on lateritic areas and there is a possibility that these could occur on Location 1766.

General

The proposal involves clearing for agricultural purposes within the agricultural region of Western Australia, as defined in Figure 1 of the EPA's *Environmental Protection of Native Vegetation in Western Australia.* The EPA's position with respect to clearing in this region is that any further reduction in native vegetation through clearing for agriculture cannot be supported. See Attachment F.

Furthermore, under the joint Commonwealth-Western Australian Government Natural Heritage Trust (NHT) Partnership Agreement and the National Strategy for the Conservation of Australia's Biodiversity, all Australian jurisdiction, including the Government of Western Australia have agreed to contribute to addressing and reversing the decline of native vegetation in Australia by limiting further broadscale clearing to those instances which do not compromise regional biodiversity conservation objectives.

Brief Statement of Reasons for PUEA level of assessment

- The proposal does not conform to the EPA's stated position as set out in the Position Statement No 2, *Environmental Protection of Native Vegetation in Western Australia,* in that the proposal is for clearing of native vegetation in Figure 1 of the Position Statement.

- The proposal occurs within the Lake Chinocup Catchment, a sub catchment of the Avon Catchment where further land clearing could exacerbate existing high levels of salinity and jeopardise the considerable efforts made to recover the health of the ecosystem.

- The proposed clearing is located on a high recharge area within the Lake Chinocup Catchment and further clearing within this catchment will increase the overall water imbalance and increase the risk of offsite land degradation.

- The proposed clearing is located within the *Environmental Protection (Swan and Canning Rivers) Policy 1997* area and has the potential to affect the water quality of the Swan and Canning Rivers.

- The proposal has the potential to affect the viability of the nearby Lake Magenta Nature Reserve and to further fragment and isolate other vegetation remnants on nearby private land, decreasing their viability for the protection of biodiversity.

- The proposal would lead to the retention of less than 20% of the original (pre-European) extent of native vegetation on the property. This would have the potential to significantly lower the present contribution of vegetation communities in the area where any remnant vegetation has a disproportionate significance because of its ability to mitigate against the long-term affects of salinity, provide links across the catchment and buffer the impacts of agricultural uses.

- The proposal has the potential to impact on threatened or poorly known flora species, in that a number of Priority species have been recorded in the near vicinity of the property.

- The proposal would lead to the generation of additional carbon emissions via clearing and the subsequent land use change.

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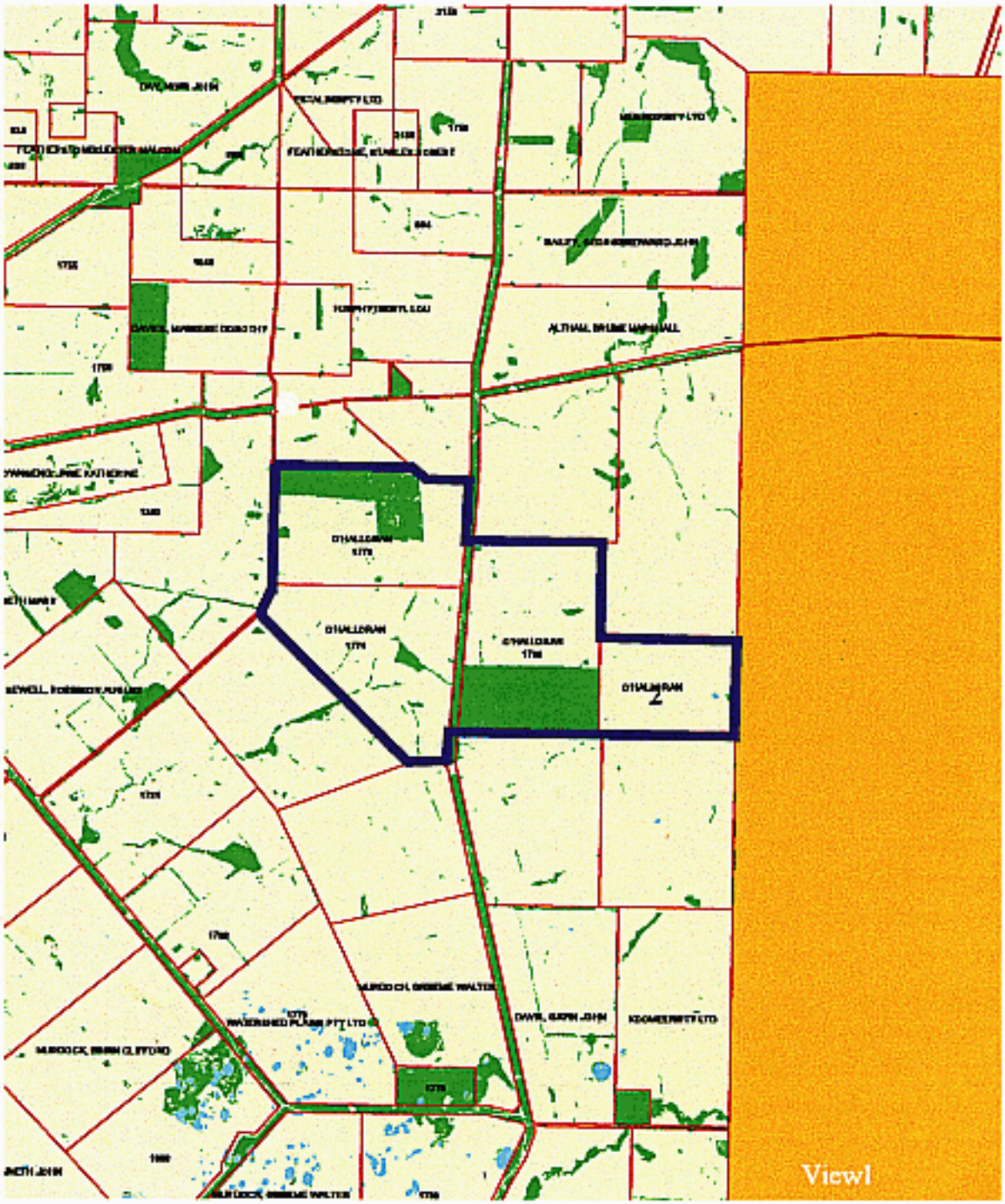


N

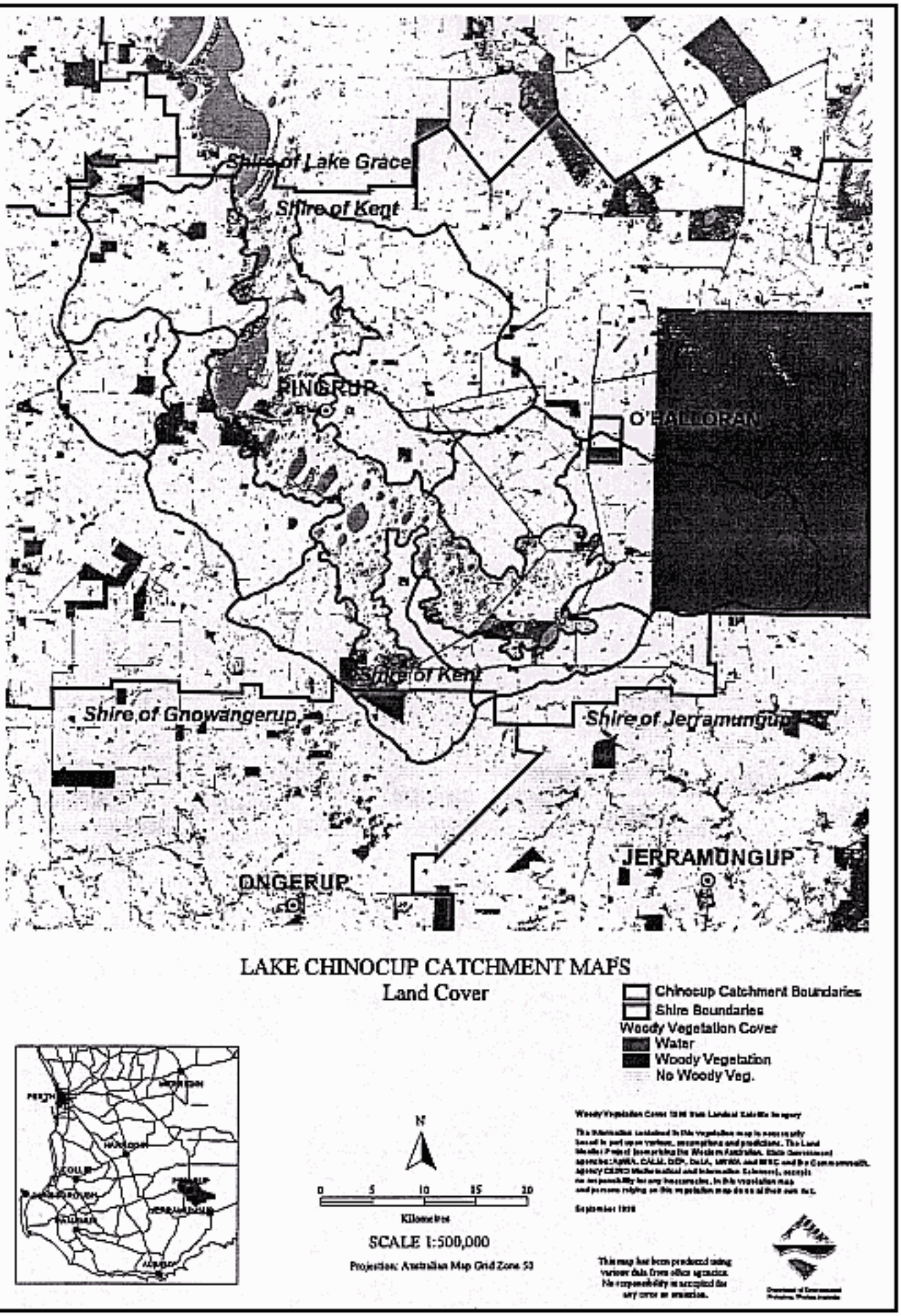
0 2 4 Kilometers

1:143929

Projection: Australian Map Grid

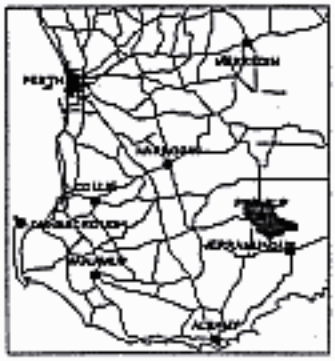
Woody Vegetation Cover Legend
Water
Woody Vegetation
No Woody Veg.
Cadastral Boundaries
CALM Managed Land 1998
Nature Reserve

ATTACHMENT A



ATTACHMENT B

LAKE CHINOCUP CATCHMENT MAPS
Landsat TM - 6 Bands - Summer 1996



Chinocup Catchment Boundaries
Shire Boundaries

N

0 5 10 15 20
Kilometres

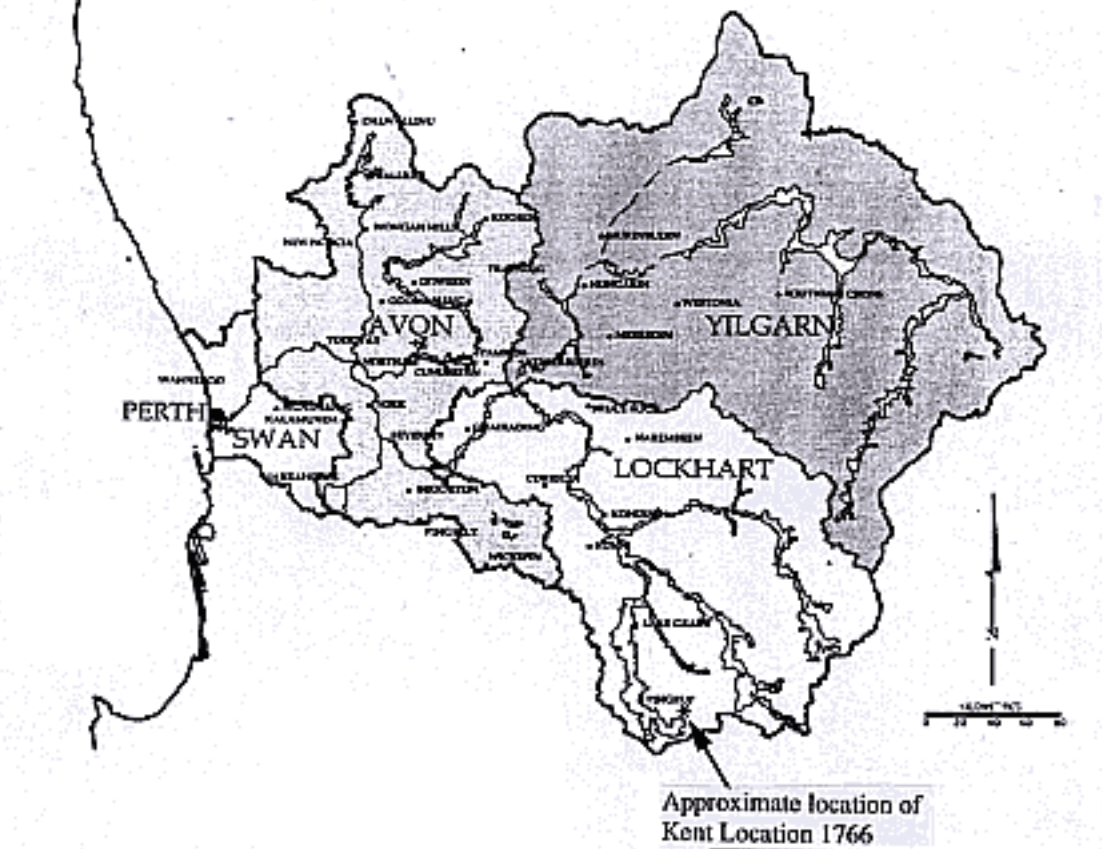
SCALE 1:500,000

Projection: Australian Map Grid Zone 50

This map has been produced using various data from other agencies. No responsibility is accepted for any error or omission.

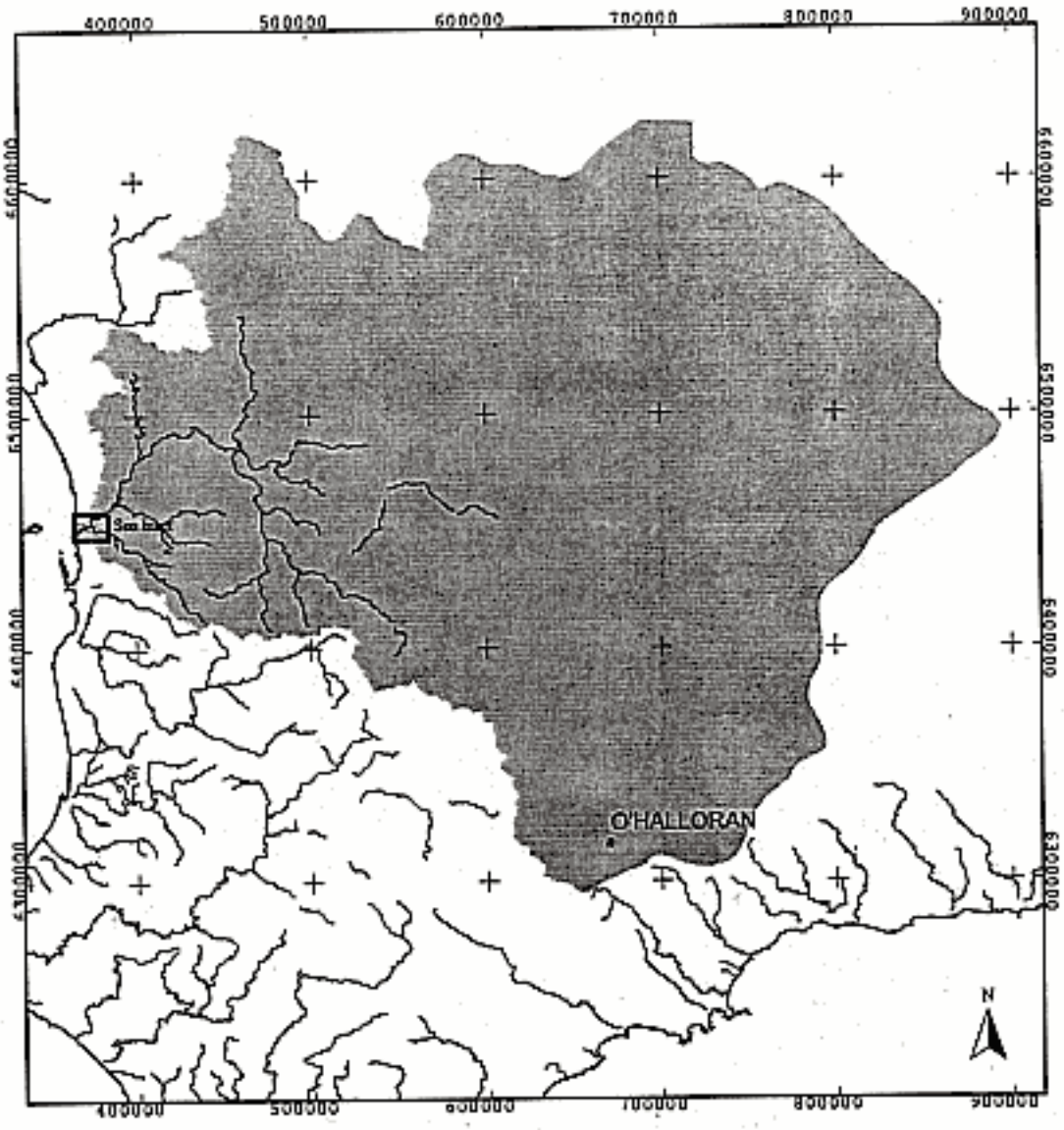
ATTACHMENT C

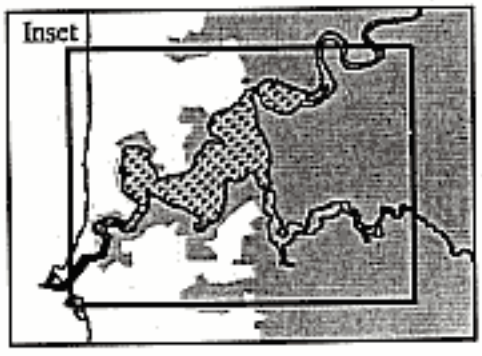
AVON RIVER BASIN



AREA OF LOCKHART CATCHMENT 3,575,676Ha
AREA OF AVON CATCHMENT 2,833,452Ha
AREA OF YILGARN CATCHMENT 5,662,200Ha
AREA OF AVON RIVER BASIN 12,071,328Ha

ATTACHMENT D

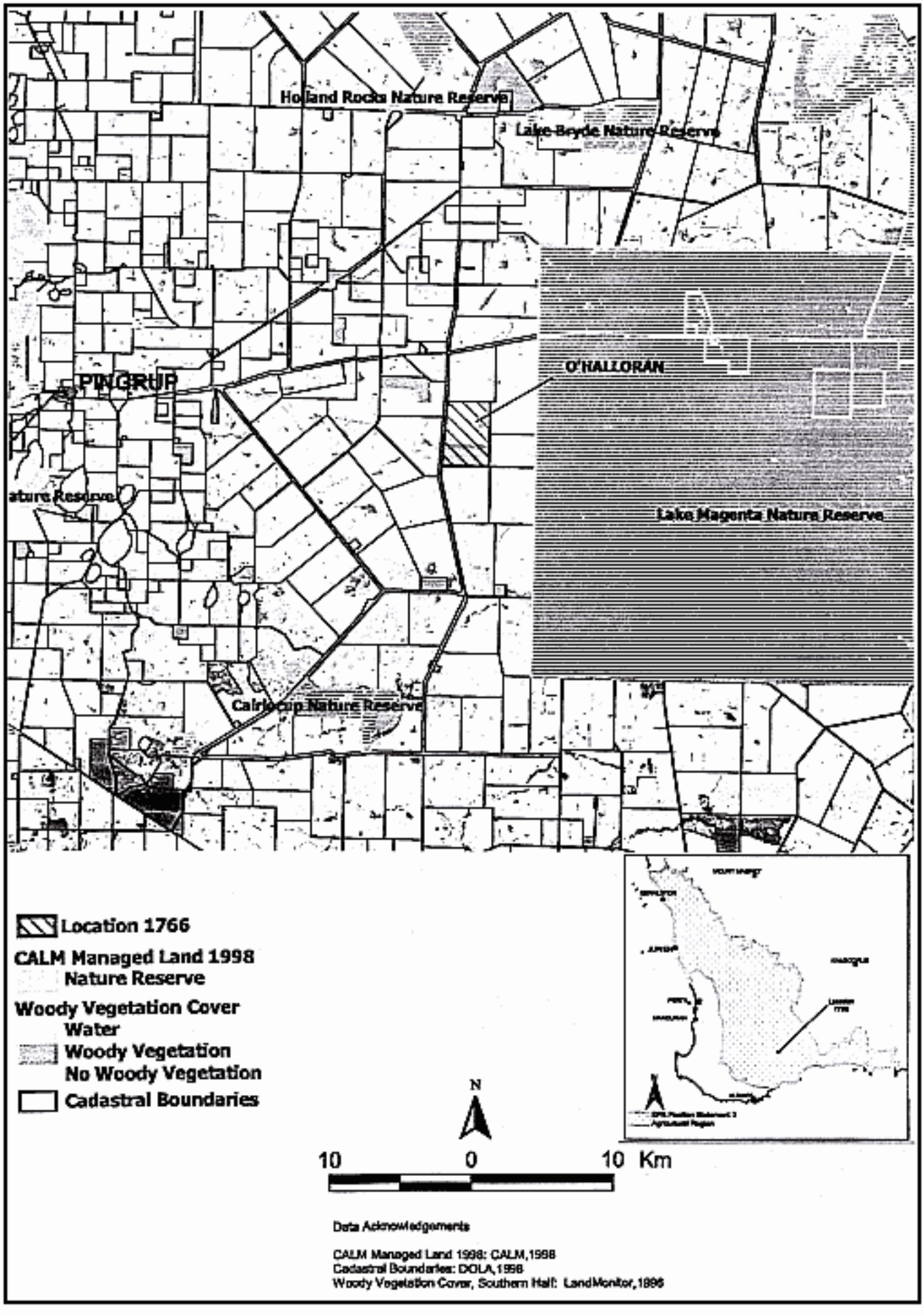




Schedule 1
"The Policy Area"

The Policy Area
Rivers
Management Areas
Port of Fremantle
Swan River Trust Management Area

ATTACHMENT E



ATTACHMENT F

Appendix 3

Calculation of greenhouse emissions for proposal to clear native vegetation
Kent Location 1766

Calculation of greenhouse (carbon) emission: Proposal to clear native vegetation: Kent Location 1766 using methodology and data from the CNGGIC workbook

Assumptions used in Calculations

Calculations of emissions from proposals to clear native vegetation require several assumptions:

- It is assumed that where forests are cleared for agricultural purposes, all burning occurs in the year of clearing;
- The net result from CO_2 uptake during subsequent regrowth is zero;
- If the area was cleared, there is no indication of the portion of the cleared biomass which will be burnt. Some might be burnt in the field to facilitate clearing (on-site burning) and some may be removed and used as fuel (off-site burning);
- A fraction of any material burned off-site is assumed to be completely oxidised and builds up in the soil as charcoal, undergoing no further CO2 release;
- Any above ground biomass which remains on site but is not burned, will oxidise in approximately a decade.

Estimating Above Ground Biomass

In estimating the above ground biomass the following approach was taken:

- Biomass estimates for each vegetation type vary widely partly because of variation in growth with climatic and soil conditions and also because of the range of species within vegetation type;
- Actual values vary even within a State. For example, in the Northern Territory, 'woodland and scrub' biomass changes from about 25t dm (dry matter)/ha near the coast to a lower value in the drier inland, with an average that might be as low as 17.5 dm/ha[1];
- IPCC default methodology assumes that original above ground biomass is destroyed after conversion from forest to agricultural lands, 90% occurring immediately and 10% over 10 years. New above ground biomass is given the default value of 10t dm/ha [2]; and
- Average estimated before clearing above ground biomass for 'woodland and scrub' is 21tC/ha [1].

Estimating Below Ground (including roots) Carbon Release:

For the estimation of below ground carbon release the following approach was taken:

- Even within one area, the magnitude and rate of loss of soil carbon after the conversion of forested land to agricultural land is highly variable due to a strong dependence on regional rainfall, soil water and isolated soil physio-chemical characteristics;
- From the limited data available, it is estimated that 30% of soil carbon is lost upon conversion of forested land to agriculture [1];
- The assumed time span for loss of soil carbon following clearing is 20 years[3] – it is assumed that soil carbon release is linear over the 20 year period (however, the rate of decay will be much faster in (say) the Northern Territory;[1]

- The assumed time span for CO_2 release from decaying roots is 10 years;

- For crops and pastures, the root biomass is assumed to be half of the above ground biomass (default value of 10t C/ha);

- The soil carbon content of unimproved pasture is 50 tC/ha and improved pasture 62.5t C/ha;

- The soil carbon of 'woodland and scrub' is estimated at 70 tC/ha[1]; and

- For calculating the annual CO_2 flux associated with the loss of soil carbon following vegetation clearing, it is assumed that soil carbon release is linear over a 20 year period. The rate of carbon released from below ground (including roots) after land clearing, the area of land clearing is multiplied by the change in soil carbon between a vegetation system and a 20 year old regrowth system, in this case to pasture (The Algorithm for this is located at Section 3.4, page 28, NGGIC workbook, 4.2)

Calculations

The calculated values from this approach was as follows:

- Above ground biomass carbon is estimated to be 21 tC/ha;

- Assume that new pasture above ground biomass is about 5tC/ha;

- Assume 184 ha;

- Emitted by clearing is 16 x 184 = 2944 tC;

- Of this amount, 90%(2650tC) will be released immediately and 10% (294tC) over 10 years;

- The below ground biomass soil carbon of 'woodland and scrub' is estimated at 70t C/ha;

- Assume 184 ha;

- Assume that new pasture below ground regrowth is 10t C/ha;

- Assume 30% of soil carbon is lost upon clearing (in actual fact, the change in soil carbon is a complicated calculation of the difference between a vegetation system and a 20 year old regrowth system, in this case to pasture);

- Then 30% x (70 –10) x 184 = 3680 t C would be lost from below ground biomass, in a linear fashion over 20 years after clearing (ie 184 t C/yr);

Therefore, total carbon emissions occurring as a result of clearing and conversion to pasture is estimated to be:

- 2650 tC released immediately, a further 2134 (1840 + 294) released over 10 years and a further 1840 (184 x 10) released over the next 10 years ie a total of approx 6624 tC over 20 years.