

Kununurra – Wyndham Area Development Strategy

Western Australian Planning Commission

**A report by the Environmental Protection Authority under
Section 16(j) of the Environmental Protection Act 1986**

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1. Introduction

1.1 Purpose of EPA advice

The primary purpose of this EPA report is to provide advice on the Kununurra-Wyndham Area Development Strategy (KWADS) as released for public comment by the Western Australian Planning Commission (WAPC) in August 1999.

The EPA's advice is provided on KWADS to ensure that environmental issues are adequately recognised and integrated into future planning for the region.

1.2 Key principles guiding the EPA's advice

In considering KWADS the EPA was guided by the key principles listed below.

- **Ecologically sustainable development**

The EPA supports the concept of ecologically sustainable development as set out in the "National Strategy for Ecologically Sustainable Development" (Commonwealth of Australia 1992), that is, development that "improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends". A core objective of the National Strategy for Ecologically Sustainable Development is to provide for equity within and between generations.

- **Conservation of biological diversity**

The Commonwealth and all State governments have signed the National Strategy for the Conservation of Australia's Biological Diversity that establishes the goal of conserving biological diversity and maintaining ecological processes and systems. Maintaining biodiversity is not only about protecting flora and fauna in nature conservation reserves, it is also about wise use of biological resources outside reserves and safeguarding the life-support systems of earth.

- **Interdependence**

Ecological processes are interconnected with physical and biological systems, food webs and natural cycles. Being interconnected and interrelated requires an understanding and appreciation that impacting or managing one part of the environment may impact on one or a number of other parts. Research has demonstrated that these interrelated and interdependent systems can be finely balanced.

- **Precautionary principle**

The precautionary principle provides that environmental impacts and decision making will be considered in a cautious way, where a high value element of the environment might be affected and there is a lack of knowledge, or insufficient knowledge, or certainty about potential impacts and management of impacts and cumulative effects. This principle is a guiding principle of the National Strategy for Ecologically Sustainable Development.

- **Prevention of pollution**

A primary responsibility of the EPA is to make recommendations to prevent pollution of the environment so that alterations to the environment do not cause unacceptable detriment or degradation of the environment and its beneficial use. (Beneficial use of the environment is defined in the Environmental Protection Act 1986).

1.3 Advice issued under Section 16(j)

The EPA's advice is provided under Section 16(j) of the Environmental Protection Act 1986. Section 16(j) empowers the EPA to publish reports on environmental matters generally. Because the EPA reports publicly its advice can be seen and considered by the public, industry, State and local government and other stakeholders.

This report does not constitute a formal assessment under Part IV of the Environmental Protection Act 1986 and does not lead to the setting of legally binding environmental conditions.

In compiling this report, the EPA has considered the information in KWADS, specialist advice from the Department of Environmental Protection (DEP) and information from other government agencies. The EPA will take into account the advice set out in this report when determining the level of environmental assessment for proposals referred under Sections 38 and 48A of the Environmental Protection Act 1986.

2. Background on KWADS

KWADS is one of a number of strategy plans which have been prepared by the WAPC for country areas.

The State government has advocated support for the development and growth of country areas. Emphasis has been placed on the diversification and continuing use of natural resources as a means to maintain growth.

KWADS has been prepared to provide direction to the long-term land use and development of the Kununurra-Wyndham area for the next 25 years. The extent of the study area is shown in Figure 1. The study area extends into the Northern Territory. While the EPA's advice is provided for the portion of the study area in Western Australia, the advice is generally relevant to the whole of the study area.

The Kununurra-Wyndham area constitutes an important focus for development, change and environmental interest in Northern Australia. Large development proposals include the proposed expansion of the Ord River irrigation area from 14,000 hectares to 78,000 hectares (Ord Irrigation Scheme Stage 2) and the use of Lake Argyle for aquaculture. Kununurra is expected to grow to accommodate approximately 10,000 people, with growth also expected at Aboriginal settlements, Wyndham and new settlements associated with the Ord Irrigation Scheme Stage 2. Land uses that will continue to be pursued in the area include pastoralism, fishing, tourism, mining, other industries, transport and infrastructure, and reservation of land for conservation purposes.

KWADS is organised into sections that address:

- the overall planning context for the area, and the planning issues;
- a vision and broad principles providing the foundation for the Strategy;
- a strategy, including objectives, a plan for the study area and recommendations to guide land use, development and conservation;
- Aboriginal settlement planning, and land use and growth at Kununurra, Wyndham and Lake Argyle; and
- implementation of the Strategy through the planning system, government, community actions and private involvement.

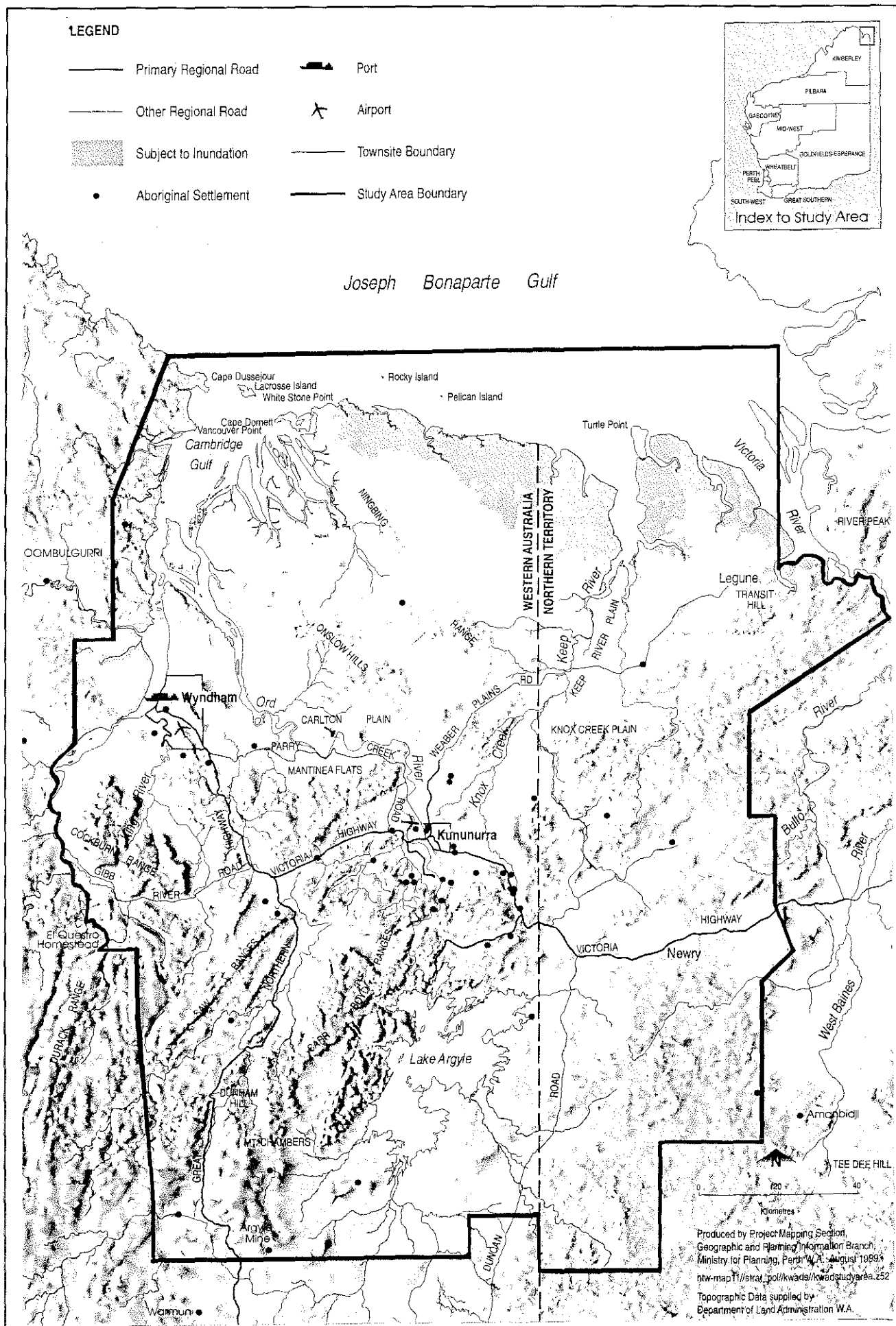


Figure 1. Location of study area (Source: colour original, Ministry for Planning 1999).

3. Discussion of environmental matters

This section addresses environmental issues relevant to KWADS, and the EPA's response and recommendations on these issues.

3.1 Overview

The EPA supports the preparation of KWADS, and recognises that as a strategic planning document KWADS provides a much needed framework to ensure that environmental, development, and social issues in the area are considered in an integrated and holistic way, to achieve the community's goals.

The EPA has identified a number of matters that it would want to be addressed either during the finalisation of the Strategy or subsequently by agencies as they progress planning in the region. However, these comments should not be read to infer that the EPA does not consider the Strategy to be a significant process that provides the opportunity to address major environmental issues in the area.

3.2 Environmental principles of the Strategy

The Strategy contains statements that support the protection of key natural assets and natural systems, the need to undertake quality research on the environment, development of an adequate and representative reserves system, and ecologically sustainable development.

The EPA supports the identification of protection of the environment as a primary principle on which the Strategy is based, and the inclusion of statements in the Strategy that reflect the key environmental principles in Section 1.2 of this report.

3.3 Studies to assist land use planning

The Strategy makes the important observation that there is still considerable work to be done in the definition of the conservation estate and the rationalisation of the boundaries of existing conservation reserves.

Conservation reserves in the past have been identified for a variety of reasons including landscape values, lack of competing land uses and availability.

The EPA supports further work to identify land for the conservation estate consistent with recent principles of protecting biological diversity, and to progress a comprehensive, adequate and representative system of conservation reserves in the area.

The EPA notes that for many parts of the region the information base on natural systems is still on a very broad scale. The Land and Water Resources Research and Development Corporation's paper on "Sustainable Development of Tropical Australia: R & D for Management of Land, Water and Marine Resources" (Johnson et al 1999) found that "increasing development pressure is occurring in tropical Australia within a context of poor data availability, and a lack of data at a scale relevant to planning and management needs". Priority areas for research identified in the paper include the Ord River catchment and the adjacent marine environment to improve knowledge of the ecology of, and relationships between, terrestrial, aquatic and marine systems.

The EPA considers that the planning issues identified in Section 3.10 "Environment and Conservation" of the Strategy should refer to the lack of, and need for, suitably detailed data on the terrestrial, aquatic and marine systems of the area, to underpin planning decisions and sustainable use and management of natural resources.

Section 5.6 of the Strategy makes recommendations on priority issues that require attention and extra studies, namely the coastline, management arrangements for the unallocated Crown land around Lake Argyle, a land use and water management strategy for the Ord River, and establishment of marine reserves. The EPA supports action on these issues.

The EPA recommends that Section 3 on planning issues should refer to the need for investigations to identify the natural values and attributes of the area, to assist in the identification of land for conservation purposes, and to ensure that biophysical aspects are adequately protected in land use planning.

3.4 Composite land use plan

While the Strategy text contains useful environmental information and direction, the EPA considers that this is not adequately reflected in the main Strategy plan "Figure 9: Composite Land Use Plan". This figure collates current land uses and development and conservation proposals.

The EPA is concerned that some users of the Strategy document may assume that the main Strategy plan is comprised of land uses which have support in principle from the relevant approval authorities, and represents all the expected new zonings and reservations in the study area for the next 25 years.

The EPA notes that key irrigated agriculture proposals in the study area are subject to the outcomes of the environmental assessment process. The EPA is currently assessing portions of the Ord River Irrigation Area Stage 2 development.

The EPA also notes that, within the 25 year timeframe of the Strategy, environmental studies may lead to modifications to existing conservation reserves and to the inclusion of additional areas to the conservation estate. For example, and as addressed in the Strategy text, the Ningbing Range is under investigation as a conservation reserve, and modifications to the reserve boundary behind the False Mouths of the Ord are being investigated to overcome management problems associated with the current boundary.

The EPA does not consider that the Composite Land Use Plan adequately represents the advice in the text that land use proposals are subject to the outcome of all approval processes and further studies.

The EPA recommends that the Composite Land Use Plan should clarify that the land use categories identified as "proposed", "future" and "possible" relate to investigation areas at the time of finalisation of the Strategy and are subject to approvals, and that other modifications to the Plan may be made during the five yearly reviews of the Strategy, as a result of further studies of the area and in response to the Strategy recommendations.

One example of this is that the outline of the proposed M2 Development Area has altered as a consequence of detailed consideration by the preferred developer.

3.5 Proposed conservation reserves; terminology

The EPA and the Department of Conservation and Land Management (CALM) have recommended conservation reserves in the study area as identified in the EPA's System 7 conservation reserve recommendations (EPA 1980), and CALM's "Nature Conservation Reserves in the Kimberley" (Watkins 1997) and "A Representative Marine Reserve System for WA" (Wilson 1994). The EPA supports the inclusion of the recommended reserves in "Figure 9: Composite Land Use Plan" and other plans in the Strategy.

However, as noted above, more comprehensive work needs to be done to develop a system of reserves. Some work is currently being undertaken by CALM, which has been working on a draft management plan for the Kimberley.

The EPA recommends that all the areas recommended by the EPA and CALM for conservation should be shown on the Composite Land Use Plan, where scale so permits. It is noted that there are some small omissions on Figure 9. For example, the Lake Argyle reserve recommended by the EPA includes islands in the lake that should be shown if possible (see also Sections 3.6 and 3.9 of this report).

The EPA notes that the areas proposed for conservation by the EPA and CALM are designated as "Regional Open Space" on the plans in the Strategy. This terminology is presumably used to retain flexibility to consider use of such areas for a range of purposes including conservation,

passive and active recreation, fishing and tourism. The EPA considers that the terminology used should more closely reflect the key conservation values of the sites. Inclusion of the word “conservation” or a similar term is recommended. The EPA notes that the term “Environmental Priority Management Area (including Conservation Estate)” is used in the State Planning Strategy (WAPC 1997). This is preferred to “Regional Open Space”.

Land uses adjoining conservation areas may have the potential to adversely impact on conservation values. The EPA recommends that Section 5.6 “Planning for the Environment and Conservation” in the Strategy should acknowledge that land uses adjoining proposed and existing conservation reserves should be managed so that the land uses do not threaten the broad underlying environmental processes that act to sustain the conservation values of the reserves. Management mechanisms may include the delineation of buffer areas to protect conservation areas at an appropriate time during the planning process.

3.6 Ramsar wetlands

The study area contains two Ramsar wetland areas. These are environmentally significant areas that were nominated by the Government of Western Australia for inclusion on the list of wetlands of international importance in June 1990. The Ramsar wetlands in the study area are:

- the Lower Ord River Flood Plain incorporating the lower reaches of the Ord River, adjoining existing nature reserves and tidal flats on the eastern side of Cambridge Gulf; and
- Lakes Argyle and Kununurra, including the portion of the Ord River between Lake Kununurra and Lake Argyle.

The boundaries are indicatively shown on “Figure 8: Conservation Reserves and Proposals”. They are included on the Kununurra Structure Plan, but are not indicated on the Preliminary Structure Plan for Mantinea Flats, or the Lake Argyle Development Node Concept. If such plans are to be included in the Strategy then it would be useful if the Ramsar wetland areas are shown.

The EPA notes that modifications are proposed to the boundaries of the Lower Ord River Ramsar site, as described in CALM’s Draft Management Plan for the Lower Ord Ramsar Site (CALM 1998).

The EPA recommends that the proposed boundaries shown in the Draft Management Plan are identified on “Figure 9: Composite Land Use Plan”. Adolphus Island should accordingly be identified as land with conservation value.

The EPA notes that the pressures on Ramsar wetlands include pastoral activities, tourism, aquaculture, fishing, irrigated agriculture and, near Lake Kununurra, urban and rural residential development.

To maintain the values of each Ramsar wetland the following are important considerations:

- the quality and quantity of water entering the wetland;
- waterfowl and wildlife habitat requirements including breeding, feeding and roosting places; and
- protection of fringing land around the waterbody.

To protect these aspects, the EPA recommends that:

- adequate land should be maintained around each Ramsar waterbody in which the primary use of the land will be conservation. It is expected that the extent of such land will vary depending on considerations such as fauna habitat requirements and sensitivity to disturbance, the erosion potential of the edges of the waterbody, protection of the quality of runoff into the wetland, the adjoining land use, and the management plan developed for the Ramsar wetland;
- activities with potential for altering the quality and quantity of water ultimately flowing into a Ramsar wetland should be managed so that they do not adversely affect Ramsar values; and

- land uses in the vicinity of a Ramsar wetland, should be undertaken sympathetically to protect Ramsar values.

The EPA considers that the recommendations in the Strategy should include the development of a process to determine buffers around Ramsar wetlands where needed, and guidelines to assist with the assessment of land uses around Ramsar wetlands, in particular at Kununurra.

The EPA recommends that the relevant structure plans in the Strategy should show Ramsar boundaries as developed by CALM.

3.7 Protection of marine waters

In the sections of the Strategy which address marine matters, including “Environment and Conservation”, “Transport and Infrastructure”, and the sections on existing and potential ports, the EPA recommends that the following potentially significant environmental issues are flagged:

- impacts on marine reserves and marine ecosystems generally, from the introduction of marine species by national or international shipping;
- loss of ecologically productive habitat such as mangroves; and
- contamination at port loading and unloading facilities.

3.8 Water use and environmental values of the Ord River

The EPA supports the acknowledgment of the environmental issues associated with the Ord River and other river systems, in the Strategy.

Taking into account an expected increase in demand for water from the Ord River, one of the major river systems of the Kimberley, the EPA has recently provided Section 16(e) advice on the Water and River Commission’s Draft Interim Water Allocation Plan for the Ord River (EPA 1999A).

The EPA concluded that further work is required to determine the environmental water provisions associated with the Ord River. The EPA advised that the Final Water Allocation Plan will be subject to separate referral and consideration under Part IV of the Environmental Protection Act 1986, and that individual applications for significant water allocation licenses can be expected to be subject to Part IV of the EPA Act in the meantime. These processes may have implications for irrigated agriculture proposals of the Ord River Irrigation Area Stage 2.

3.9 Mirima National Park and Packsaddle Swamp

The EPA notes that “Figure 9: Composite Land Use Plan” shows only the existing boundaries of the Mirima National Park near Kununurra. However, expansion is proposed, as indicated on “Figure 11: Kununurra Structure Plan”.

Similarly, the EPA notes that the Packsaddle Swamp area has been identified for open space purposes on “Figure 11: Kununurra Structure Plan”. However, it is identified as unallocated Crown land rather than proposed open space (conservation) on the Composite Land Use Plan.

The EPA recommends that the Composite Land Use Plan be modified to show the proposed boundaries of the Mirima National Park, and to show an appropriate designation for the Packsaddle Swamp area to reflect its conservation values.

3.10 Ecologically sustainable development

The Strategy recognises the need to ensure that land uses are carried out in a long term sustainable manner by protecting natural assets, keeping natural systems healthy, and based on quality research.

The EPA recognises that the thrust of the Strategy is consistent with the principle of ecologically sustainable development, a key environmental principle supported by the EPA. The EPA encourages the Strategy to go further and flag the main environmental issues relevant to ecologically sustainable development in the sections on planning issues for irrigated agriculture, fishing and aquaculture and pastoralism (as discussed in Sections 3.11, 3.12 and 3.13 below). Such information would assist in achieving an objective of the Strategy, to provide helpful guidance on key planning issues in the area.

In the discussion on the “Economic Development Principle” in Section 4 of the Strategy, “sustainable economic development” is referred to. It is not clear whether ecologically sustainable development as defined in the “National Strategy for Ecologically Sustainable Development” is meant. Taking into account wide government support for ecologically sustainable development, the EPA recommends that the term “sustainable” should only be used in this context, unless an alternative context is made quite clear.

3.11 Irrigated agriculture

Proposals to substantially increase the area under irrigated agriculture in the study area are currently under investigation. The Strategy shows future irrigation areas:

- along the Ord River in the Mantinea Flats and Carlton Plain area;
- along the Keep River and Weaber Plains; and
- adjoining the existing Ord Stage 1 area at Green Location, Ord West Bank and Packsaddle Plain.

The development of land, especially large tracts, for irrigated agriculture raises a raft of environmental issues. These include protection of biodiversity, flora and fauna, sustainability of natural systems, water management, greenhouse gas issues, and social considerations.

The EPA has considered that the environmental impacts of the proposed Ord River Irrigation Area Stage 2 - M2 Channel Supply Area, and the proposed Ord River Irrigation Area Stage 2 - Carlton Plain and Mantinea Flats Area, are so significant as to warrant formal assessment of the proposals.

As mentioned in Section 3.4 above, the EPA is concerned that the Composite Land Use Plan does not make it clear that the areas shown as “Ord Irrigation Scheme Stage 2 - Future” are at this stage indicative. Although the general text refers to the need for all approvals to be achieved for irrigated agriculture to proceed, this is not reflected in the recommendations or plans in the Strategy.

It is recommended that the list of environmental issues associated with irrigated agriculture is expanded. Issues that should be flagged include those in paragraph 2 above.

Issues associated with irrigated agriculture include not only the potential for incompatible adjacent land uses to adversely affect agricultural activity, as referred to in the Strategy, but also for agricultural activities to adversely impact on other land uses, such as conservation reserves, through the introduction of weeds, pests, spray drift and other disturbances. This should be recognised in the Strategy.

The Strategy should recognise current environmental issues with the Ord Irrigation Scheme Stage 1. These issues include a rising water table, loss of biodiversity, and export of nutrients and other contaminants.

The EPA recommends that the objective for irrigated agriculture should mention the need to ensure ecologically sustainable development. This is consistent with other portions of the Strategy.

In advance of the finalisation of the environmental assessment of Mantinea Flats, the publication of the Preliminary Structure Plan for Mantinea Flats in an endorsed Strategy and without supporting technical information, is considered to be premature. The inclusion of an appropriate structure plan in a review of the Strategy after the proposals it contains have

undergone key assessments, is considered more appropriate. Clarification in the Strategy of the procedures associated with progressing the preliminary structure plan to the next stages of the land use planning process would be helpful. These procedures should include the submission and consideration of environmental information.

Structure planning for Mantinea Flats should show all relevant adjoining land uses. It is noted that the Parry Lagoons Nature Reserve which abuts a proposed horticulture area, is not delineated on Figure 10 of the Strategy. Two roads are shown encroaching into this conservation reserve. Road alignments through conservation reserves need to be carefully assessed to ensure that they meet environmental objectives.

3.12 Fishing and aquaculture

The Strategy refers to aquaculture as potentially a large growth industry for the Kimberley, with the emphasis initially being on promotion of Lake Argyle as a location for the development of a large scale freshwater aquaculture industry.

The EPA supports the objectives for fishing and aquaculture in Section 5 of the Strategy.

The EPA considers that aquaculture activities have the potential to significantly impact on the environment. The EPA has decided to formally assess a proposal to develop a prawn farm on tidal flats near Wyndham, and has provided advice under Section 16(e) of the Environmental Protection Act 1986 on the proposed Lake Argyle barramundi aquaculture industry (EPA 1999B).

The EPA has advised that the environmental factors that would need to be addressed in any assessment of an individual proposal for a barramundi production industry on Lake Argyle are:

- water quality;
- Ramsar wetlands and protection of environmental values;
- maintenance of genetic diversity of wild barramundi stock; and
- visual amenity.

While the relevant environmental factors for aquaculture proposals may vary, the key concerns include:

- introduction of non-endemic species;
- effects on the genetic diversity of native stock;
- diseases;
- impacts on biodiversity values; and
- water quality.

The EPA recommends that the above issues are acknowledged in the Strategy.

3.13 Pastoralism

The Strategy lists many of the pressures that pastoralists are facing in the region. However, it is silent on the matter of the impacts pastoralism can have in relation to the environment. These impacts include erosion, loss of nutrients, degradation of soil structure, degradation of watering points with downstream implications, and adverse effects on conservation areas and the maintenance of biodiversity.

The EPA has identified protection of Western Australian rangelands as an important issue, and released a draft policy on rangelands protection (EPA 1997).

The EPA notes recent amendments to the Land Administration Act which empower the Pastoral Lands Board to ensure that pastoral leases are managed on an ecologically sustainable basis.

The Strategy refers to the increased awareness of land degradation over the years bringing with it improved land management practices through fencing and watering of cattle.

The EPA considers that the Strategy should go further and, after discussing the impacts pastoralism can have on the environment, the text should discuss the need for the pastoral industry to continue to make improvements in management practices consistent with the principles of ecologically sustainable development. The Strategy presents an opportunity to encourage and promote the adoption of best environmental practice for rangeland management. The above EPA policy and Land Administration Act powers could be noted in the Strategy.

3.14 Transport and infrastructure

The Strategy notes that new roads would be required with the expansion of the irrigated agriculture industry. Several possible new roads are shown as subject to a separate study on “Figure 9: Composite Land Use Plan”.

One of these roads links with the existing Parry Creek Road, a dry weather road which traverses Parry Lagoons Nature Reserve, an area with significant conservation value.

The route for any upgraded road needs to be carefully considered to ensure that it is environmental acceptable.

The EPA considers that the Strategy should refer to the need to take into account environmental factors in planning for new transport routes and other infrastructure.

The section on infrastructure excludes the consideration of waste management facilities. Because of land use compatibility and environmental impacts, specific consideration of waste management facilities is warranted in any land use planning strategy.

3.15 Culture and heritage

The link between Aboriginal culture and heritage and the environment is recognised in the Strategy. However, the sections on European heritage appear to link European heritage with buildings only. The EPA notes that places with predominantly natural characteristics can have significance for European heritage. An example is Lake Argyle which is under investigation for inclusion on the Register of the National Estate, for its natural values.

The EPA supports the inclusion of Aboriginal culture and heritage considerations as an important component of wider planning initiatives associated with management of resources and the environment.

The EPA recommends that the discussion on European culture and heritage be expanded to include natural heritage places.

3.16 Unallocated Crown land and Crown reserves

The Strategy identifies extensive areas of unallocated Crown land. Some of this land is under pressure from competing land uses. For example, overgrazing by cattle, as well as other causes, has been associated with adverse impacts on the environmental values of the Lake Argyle area. Other areas of unallocated Crown land also require investigation to determine appropriate use and management, including the west Cambridge Gulf area.

EPA supports the Strategy recommendation that appropriate vesting and management structures for the unallocated Crown land surrounding Lake Argyle be determined in consultation with a range of government authorities, including the DEP.

The EPA notes that it would be useful if the purposes of the Crown reserves shown on “Figure 9: Composite Land Use Plan” are specified, where the scale of the plan permits.

3.17 Kununurra Structure Plan

The Strategy contains a structure plan for Kununurra which provides for additional residential, rural residential, tourist node, industrial, regional open space and commercial/mixed business areas, and a new primary regional road on the north side of Kununurra.

The EPA supports the preparation of structure plans. The structure planning process is considered to play a key role in ensuring that land use planning and development maintain a quality environment.

However, in the case of the Kununurra Structure Plan, the EPA notes that there is very little information provided in KWADS on the environmental factors relevant to the expansion of Kununurra. A paragraph in Section 6.2 “Constraints” briefly refers to the environmental significance of Lake Kununurra, the 500 metre buffer around the sewage treatment plant, and Kununurra airport. Based on the information provided in the section on the Kununurra Strategy Plan, it is not possible to conclude that the relevant environmental factors have been adequately taken into account.

The EPA considers that Section 6 “Kununurra Structure Plan” should demonstrate that environmental factors have been adequately addressed. It is noted that “Diagram 1: Land Use Planning Hierarchy” in the Strategy advises that structure plans “would incorporate supporting technical studies ie - physical - social - economic”.

Important environmental issues for Kununurra are considered to include:

- sympathetic development in proximity to the Mirima National Park;
- sympathetic development around the Ramsar nominated wetlands of Lake Kununurra;
- protection of water quality of Lake Kununurra and the Ord River; and
- protection of residential amenity and the environment from pollution (including noise, odour, vibration and contamination) caused now and in the future by such uses as industry, airport, effluent treatment and rubbish disposal.

Taking into account the need to progress planning for future residential and tourist areas in Kununurra, the EPA recommends that the issue of development near sensitive environmental areas be addressed promptly and include studies of the values and attributes of the Ramsar and National Park areas, with a view to establishing appropriate buffers around areas of conservation significance, management of stormwater disposal near Lake Kununurra and Lily Creek Lagoon, and guidelines for development in these areas generally.

The above matters need to be addressed before proposed tourist nodes and future residential development areas can be defined in the Structure Plan area near Lake Kununurra, Lily Creek Lagoon and Mirima National Park.

Clarification in the Strategy of the process that should follow the current stage of planning for Kununurra would be helpful. This should confirm the need for more detailed environmental studies.

The EPA supports the Strategy recommendation that a management plan be prepared for the waterways of Lake Kununurra. This should be complemented by a study of, and recommendations for, the use and management of the fringing land, including land around Lily Creek Lagoon. The EPA’s advice on Ramsar wetlands in Section 3.6 of this report is relevant to the structure planning process for Kununurra. The EPA supports the inclusion of the indicative Ramsar wetland area boundary on the Kununurra Structure Plan.

The advice in Section 3.5 of this report on the terminology used for land with conservation value is also relevant to the Kununurra Structure Plan. It is recommended that “conservation” be included in the Structure Plan legend designation for areas of existing and future Regional Open Space with significant conservation values.

3.18 Wyndham Structure Plan

The Wyndham Structure Plan provides for a number of new zones. The discussion about ensuring that structure plans are accompanied by sufficient supporting information to justify new zonings (in Section 3.17 above) and the terminology used for areas of Regional Open Space with conservation significance (Section 3.5 of this report) are relevant to the Wyndham Structure Plan.

The discussion on the Structure Plan envisages a potential increase in activities in the port area. The EPA considers that Section 7.2 that addresses the planning “constraints” for the port area should refer to the potential environmental issues in Section 3.7 of this report. Further, expansion of the port and port activities should take into account the proposal to develop marine reserves to the north.

3.19 Lake Argyle Development Node

The discussion in the Strategy on the Lake Argyle Development Node (Section 9 of the Strategy) refers in general terms to the need for land use planning and resource management to take into account a “vast range of environmental and water allocation considerations”.

While the general reference to the need to consider environmental matters is supported, the EPA considers that it would be useful for key environmental considerations to be flagged in Section 9 of the Strategy.

Key environmental issues for development at the northern end of Lake Argyle include the Ramsar values of Lake Argyle (see Section 3.6 of this report); surface water and groundwater quality, quantity and flow regimes; the conservation values of the area; and cultural and heritage factors. Specific proposals may also raise other environmental considerations.

The EPA recommends that the Strategy refer in Section 9 to the proposed conservation reserve comprising land on the western side of Lake Argyle and islands in the lake. It is noted that the proposed conservation reserve has been omitted from “Figure 15: Lake Argyle Development Node Concept”, although it is indicated on “Figure 9: Composite Land Use Plan”.

The indicative concept plan for the Lake Argyle Development Node shows in a general way locations for potential uses, namely water based aquaculture, land based servicing of offshore aquaculture and redevelopment of the tourist village.

Expansion of aquaculture at Lake Argyle is likely to be subject to formal environmental assessment. In its advice on the development of a barramundi industry at Lake Argyle (EPA 1999B), the EPA has indicated that formal environmental assessment can be expected before an industry producing up to 2000 tonnes per annum may proceed.

Given that the function of the Strategy is to provide guidance and some certainty on future land use planning directions, and that key proposed uses in the Lake Argyle Development Node area have yet to demonstrate that they are environmentally acceptable, the EPA considers that it is preferable to defer inclusion of “Figure 15: Lake Argyle Development Node Concept” in the Strategy until further review of proposals by key assessment authorities, including the EPA, has been undertaken.

3.20 Implementation

For the Strategy to provide a framework for coordinating planning and development, various responsibilities need to be identified and implemented.

The EPA supports the formation of a regional planning coordinating committee, as recommended in the Strategy, to achieve integrated decision making. This committee should be resourced and include adequate representation from environmental and natural resource management agencies.

Section 10.1 of the Strategy recognises that implementation options include “using relevant processes and instruments of planning and management agencies”. Environmental approval processes are not specifically referred to. Since referral and assessment procedures under Part IV of the Environmental Protection Act 1986 form an integral part of planning and development processes, the EPA considers that Section 10.1 should refer, at least in general terms, to the processes of the environmental agencies, in addition to those of the planning and management agencies.

The Strategy refers to the need to monitor and review the Strategy. The EPA supports regular reviews of the Strategy, and monitoring to ensure that, inter alia, environmental objectives are being fulfilled. The EPA recommends that the Strategy should specify key indicators for monitoring purposes, or recommend that these be identified as a matter of priority.

The Strategy includes a number of recommendations in Section 5 and lists government agencies to carry out the recommendations. The EPA recommends that the DEP is identified in the Strategy as an agency to provide advice on the preparation of structure plans in the area, and the identification of sites for industrial development nodes (Section 5 of the Strategy).

The reference to the DEP as an agency involved in carrying out the recommendations in Section 5.6 "Planning for the Environment and Conservation" is supported.

3.21 Legislation

All development proposals in Western Australia that may have a significant impact on the environment are subject to the provisions of the Environmental Protection Act 1986.

The EPA recommends that the Environmental Protection Act 1986 is included under the heading "Legislation" in the section on "References" at the end of the Strategy.

4. Summary of EPA advice

4.1 Matters supported

The EPA supports:

- a) the preparation of KWADS, and recognises that as a strategic planning document KWADS provides a much needed framework to ensure that environmental, development and social issues in the area are considered in an integrated and holistic way;
- b) protection of the environment as a primary principle on which the Strategy is based;
- c) the inclusion of statements in KWADS that reflect the key environmental principles of ecologically sustainable development, conservation of biological diversity, and prevention of pollution, as outlined in Section 1.2 of this report;
- d) the development of a comprehensive, adequate and representative system of both land and marine reserves to protect biodiversity in the area;
- e) promotion of studies to identify the natural values and attributes of the area and relationships between terrestrial, aquatic and marine systems to underpin planning decisions and sustainable use and management of natural resources;
- f) inclusion of Aboriginal culture and heritage considerations as an important component of wider planning initiatives associated with management of resources and the environment;
- g) appropriate vesting and management structures for the unallocated Crown land surrounding Lake Argyle, determined through consultation with a range of government authorities, including the DEP;
- h) the formation of a regional planning coordinating committee to progress implementation of the Strategy, to include adequate representation from environmental and natural resource management agencies; and
- i) regular review and monitoring of KWADS, to include environmental issues.

4.2 EPA Recommendations

The following summary of the EPA's recommendations should be read in conjunction with the discussion in Section 3 of this report. Should some matters be considered not appropriate to include in a regional strategy planning document, then the EPA expects that the Strategy would clarify that a range of environmental matters have yet to be addressed in detail, that they can be expected to be raised at subsequent stages of the land use planning process, and that some revision of the plans may result.

- a) The planning issues in Section 3.10 “Environment and Conservation” should refer to the lack of, and need for, suitably detailed data on the terrestrial, aquatic and marine systems of the area, to assist in the identification of land for conservation purposes, and to underpin decision making with regard to the sustainable use of natural resources.
- b) “Figure 9: Composite Land Use Plan” should acknowledge that the land use categories identified as “proposed”, “future” and “possible” relate to investigation areas at the time of approval of the Strategy, and are subject to all approvals, and that modifications to the Plan may be made during the five yearly reviews of the Strategy, as a result of further studies of the area and in response to the Strategy recommendations.
- c) All the areas recommended by the EPA and CALM for conservation should be shown on “Figure 9: Composite Land Use Plan”, where scale so permits, including the islands proposed for inclusion in the Lake Argyle conservation reserve, Adolphus Island in Cambridge Gulf, and the proposed conservation areas at Packsaddle Swamp and adjoining Mirima National Park.
- d) Section 5.6 “Planning for the Environment and Conservation” should acknowledge that land uses adjoining proposed and existing conservation reserves should be managed so that the land uses do not threaten the broad underlying environmental processes that act to sustain the conservation values of the reserves.
- e) References to “Regional Open Space” in the plans in the Strategy should be amended so that “conservation” or a similar term is included in the designation used for all sites specifically identified for their conservation values.
- f) The relevant structure plans in the Strategy should show Ramsar boundaries as developed by CALM, as well as indicate that buffers (where these are not part of the designated Ramsar site) and mechanisms to protect Ramsar values need to be investigated prior to development occurring near Ramsar wetlands.
- g) In the sections of the Strategy relating to marine matters, the following potentially significant environmental issues should be flagged:
 - impacts on marine reserves and marine ecosystems generally from the introduction of marine species by national or international shipping;
 - loss of ecologically productive habitat such as mangroves; and
 - contamination at port loading and unloading facilities.
- h) Taking into account wide government support for ecologically sustainable development, the term “sustainable” should only be used in this context, unless an alternative context is made quite clear. The term “sustainable economic development” is referred to in the section on the economic development principle. However, it is not clear whether ecologically sustainable development as defined in the “National Strategy for Ecologically Sustainable Development” is meant.
- i) In the sections on irrigated agriculture, the Strategy should:
 - recognise current issues for the Ord River Irrigation Areas Stage 1, including a rising water table, loss of biodiversity of the plains, and export of nutrients and other contaminants;
 - recognise that environmental issues associated with the expansion of the area under irrigated agriculture include protection of biodiversity, flora and fauna, sustainability of natural systems, water management, greenhouse gas issues, and social considerations; and
 - expand the objective for irrigated agriculture by adding “to ensure ecologically sustainable development”.
- j) Consideration should be given to deferring inclusion in the endorsed Strategy of a plan for Mantinea Flats until after key assessments have occurred, including the environmental assessment of irrigated agriculture in the area. Clarification in the Strategy of the procedures associated with progressing the preliminary structure plan to the next stages of

the land use planning process would be helpful. These procedures should specify the submission and consideration of environmental information.

- k) Should a plan for the Mantinea Flats area be included, it should show all relevant adjoining land uses, including the adjoining Parry Lagoons Nature Reserve.
- l) In relation to aquaculture, the Strategy should flag the following environmental issues:
 - introduction of non-endemic species;
 - affects on the genetic diversity of native stock;
 - introduction of diseases;
 - impacts on biodiversity values; and
 - water quality, and disposal of wastes.
- m) The planning issues for pastoralism should include the impacts pastoralism may have on the environment. These impacts include erosion, loss of nutrients, degradation of soil structure, degradation of watering points with downstream implications, and adverse effects on conservation areas and the maintenance of biodiversity. The need for the pastoral industry to continue to make improvements in management practices consistent with the principles of ecologically sustainable development should be referred to.
- n) The Strategy should refer to the need to take into account environmental factors in planning for new transport routes and other infrastructure. In particular, the provision of waste management facilities should be included in the Strategy.
- o) The discussion on European culture and heritage should be expanded to include natural heritage places.
- p) It would be useful if the purposes of the Crown reserves shown on “Figure 9: Composite Land Use Plan” are specified, where the scale of the plan permits.
- q) Section 6 “Kununurra Structure Plan” should include sufficient supporting information to demonstrate that the Structure Plan adequately takes into account environmental issues. These include but are not limited to:
 - sympathetic development in proximity to the Mirima National Park;
 - sympathetic development around the Ramsar nominated wetlands of Lake Kununurra;
 - protection of the water quality of Lake Kununurra and the Ord River; and
 - protection of residential amenity and the environment from pollution (including noise, odour, vibration and contamination) caused now and in the future by such uses as industry, airport, effluent treatment and rubbish disposal.
- r) Taking into account the need to progress planning for future residential and tourist areas in Kununurra, the issue of development near sensitive environmental areas may need to be addressed promptly. Supporting studies should address the values and attributes of the Ramsar and National Park areas, with a view to determining appropriate buffers around areas of conservation significance, guidelines for development in these areas generally, and management of stormwater disposal near Lake Kununurra. The above matters need to be addressed before proposed tourist nodes and future residential development areas can be defined in the Structure Plan area near Lake Kununurra, Lily Creek Lagoon, and Mirima National Park. Clarification in the Strategy of the process that should follow the current stage of planning for Kununurra would be helpful. This should confirm the need for more detailed environmental studies.
- s) The Strategy recommendation that a management plan be prepared for the waterways of Lake Kununurra should be complemented by a study of, and recommendations for, the use and management of the fringing land, including land around Lily Creek Lagoon.
- t) The Wyndham Structure Plan should be accompanied by sufficient supporting information on environmental factors to justify the new zonings.

- u) Key environmental issues for development at the northern end of Lake Argyle should be referred to in Section 9 “Lake Argyle Development Node”. These include the Ramsar values of Lake Argyle (see Section 3.6 of this report); surface water and groundwater quality, quantity and flow regimes; the conservation values of the area; and cultural and heritage factors. Specific proposals may also raise other environmental considerations.
- v) The Strategy should refer in Section 9 to the proposed conservation reserve comprising land on the western side of Lake Argyle and islands in the lake. It is noted that the proposed conservation reserve has been omitted from the Lake Argyle Development Node Concept Plan although it is indicated on “Figure 9: Composite Land Use Plan”.
- w) Given that the function of the Strategy is to provide guidance and some certainty on future land use planning directions, and that key proposed uses in the Lake Argyle Development Node area have yet to demonstrate that they are environmentally acceptable, it is considered preferable to defer inclusion of “Figure 15: Lake Argyle Development Node Concept” in the Strategy, until further review of key proposals by assessment authorities, including the EPA, has been undertaken.
- x) Since referral and assessment procedures under Part IV of the Environmental Protection Act 1986 form an integral part of planning and development processes, Section 10.1 should refer, at least in general terms, to the processes of the environmental agencies, in addition to those of the planning and management agencies.
- y) The Strategy should specify key indicators for monitoring purposes, or recommend that these be identified as a matter of priority.
- z) The DEP should be identified in the Strategy as an agency to provide advice on the preparation of structure plans in the area, and on the identification of sites for industrial development nodes (in Section 5.1 of the Strategy).
- aa) The Environmental Protection Act 1986 should be included under the heading “Legislation” in the section on “References” at the end of the Strategy.

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