

**Proposals to amend the 1987 Forest Management  
Plans and Timber Strategy and proposals to meet  
Environmental Conditions on the Regional Plans  
and the WACAP ERMP**

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**Department of Conservation and Land Management**

**Summary and recommendations extract from report and  
recommendations of the Environmental Protection Authority**

**Environmental Protection Authority  
Perth, Western Australia  
Bulletin 652  
October 1992**

## THE PURPOSE OF THIS REPORT

This report contains the Environmental Protection Authority's environmental assessment and recommendations to the Minister for the Environment on the environmental acceptability of the proposals.

Immediately following the release of the report there is a 14-day period when anyone may appeal to the Minister against the Environmental Protection Authority's recommendations.

After the appeal period, and determination of any appeals, the Minister consults with the other relevant ministers and agencies and then issues his decision about whether the proposals may or may not proceed. The Minister also announces the legally binding environmental conditions which might apply to any approval.

## APPEALS

If you disagree with any of the assessment report or recommendations you may appeal in writing to the Minister for the Environment outlining the environmental reasons for your concern and enclosing the appeal fee of \$10.

It is important that you clearly indicate the part of the report you disagree with and the reasons for your concern so that the grounds of your appeal can be properly considered by the Minister for the Environment.

## ADDRESS

Hon Minister for the Environment  
18th Floor, Allendale Square  
77 St George's Terrace  
PERTH WA 6000

## CLOSING DATE

Your appeal (with the \$10 fee) must reach the Minister's office no later than 5.00 pm on 23 October, 1992

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## Summary and recommendations

The Environmental Protection Authority (EPA) has reviewed forest management proposals by the Department of Conservation and Land Management (CALM) for 1992 onwards. CALM is now the direct manager of timber harvesting rather than, as previously, the controller of timber companies. The last review by EPA was in 1987 when five to ten year management plans were examined.

The 1992 proposals are outlined by CALM in the following documents:

- Proposals to Amend the 1987 Forest Management Plans and Timber Strategy and Proposals to Meet Ministerial Conditions on the Regional Plans and the WACAP ERMP
- Management Strategies for the South-West Forests of Western Australia : A Review - Draft for Public Comment
- A Nature Conservation Strategy for Western Australia - A Draft for Public Comment
- National Estate Values in the Southern Forest Region, South West Western Australia

These documents were all subject to public review under CALM's legislation. The first was also jointly reviewed as part of this environmental assessment.

The Authority received more than 1000 submissions from the public and organisations during the public review of the proposals by CALM.

The recent Resource Assessment Commission Forest and Timber Inquiry and the Ecologically Sustainable Development Working Groups Report on Forest Use provided a very useful framework within which to consider a number of the proposals. In addition, the Authority was guided by comments made in its earlier assessments of the WA Chip & Pulp Co Pty Ltd proposal to continue the woodchip export industry and the 1987 Forest Region Management Plans and Timber Strategy.

The Authority convened a Technical Advisory Panel (TAP) to provide expert advice on specific issues and employed a forestry expert, Dr Ken Shepherd of the Australian National University, to review CALM's documentation. In addition, CALM provided detailed responses to the issues raised in public submissions and also a response to questions posed by the Authority to the Technical Advisory Panel.

These proposals, the additional information made available through the process of public review, as well as answers to specific questions asked of CALM by the Authority, and advice provided by the Technical Advisory Panel, have formed the basis for this assessment. All the additional information is included in appendices to this report.

CALM has proposed a new overall forest management objective:

*"To manage the native forests of the south west of Western Australia, in consultation with the community, so that they provide the values required by society while sustaining indefinitely their biological and social diversity."*

The Authority considers this a laudable objective which would appear to provide for the range of the community's expectations for their forests.

The forest review can be separated into proposals for management of karri forest and proposals for the jarrah forest.

### The Karri Forest

In the karri forest major changes were introduced almost 20 years ago with clearfelling yielding logs separated into timber for sawlogs, timber for wood chipping and other wood. Clearfelling enabled better regeneration and provided more efficient forest harvesting, increased forest growth rate and integration of management. Over those 20 years a series of environmental conditions have been put in place and it is now considered that the operation is environmentally acceptable. There is an excellent system of conservation reserves in the karri forest based mainly on EPA Red Book Recommendations of the 1970s.

As part of the original woodchip proposal road, river and stream reserves were devised to protect visual amenity, wildlife and stream water quality. In the present proposals the major change proposed by CALM is to redistribute the road, river and stream reserves to enhance stream protection at the cost of the width of road reserves. CALM has proposed that a sophisticated form of visual amenity assessment for determining road reserves be the basis of such redistribution, and the EPA has recommended to the Minister for the Environment that this change is environmentally acceptable subject to some recommendations being carried out. Another acceptable change is the proposed creation of additional conservation reserves.

### **The Jarrah Forest**

CALM's proposals for the jarrah forest involve major changes to forest management in Western Australia - the most significant since the extensive forest clearfelling of large areas of the forest in the 1930s. These changes have been progressively implemented by CALM over the last five years. Both Dr Ken Shepherd and the Technical Advisory Panel have commended CALM's conservation objectives in forest management as being the best in Australia. They also highlight the extensive nature of the jarrah forest proposals by CALM and the need for caution and the necessity to leave room to change if these proposals produce unacceptable impacts.

Historically the jarrah forest has been treated conservatively since the major disturbances of the 1930s. Most of the timber harvesting activities, and most of the forest disturbances, have been directed towards the wetter western one third of the forest (high rainfall zone). This portion was quite productive and had less environmental uncertainties associated with it.

Since the 1930s, the Jarrah forest has been cut for timber by selecting a small number of large trees from a mixed forest. This can be compared with the karri forest where clearfelling has become the norm over the last 20 years. The jarrah forests have previously not been clearfelled because, unlike the karri forests, jarrah does not 'self thin'. The many young seedlings in a karri forest regenerating after clearfelling compete for light which leads to self thinning. Jarrah forests re-grow to dense pole stands at 20 to 30 years, have no mechanism for self thinning and require imposed thinning or they grow more slowly. In the past, clearfelling of jarrah has been avoided because there has been no economic way of imposing that thinning through management. The new proposal sees gap creation, a process similar to clearfelling, and other intensive management techniques as becoming the common silvicultural technique in the jarrah forest. This imposes a long term requirement for on-going thinning.

Intensive harvesting in the central and eastern jarrah forest has been avoided in the past because of the risk of salt intrusion into soils and streams. With clearing of native vegetation there is a rise in groundwater table which may bring salt from deep in the soil to the surface. This process has led to extensive salinisation in agricultural areas in Western Australia. This is not such a problem with clearfelling of karri because of the lower levels of salt stored in the soils beneath karri forests. In this 1992 proposal CALM proposes intensive logging and extensive clearfelling over time in much of the central and eastern forests on the basis that regrowth of forests will occur quickly enough to prevent significant or long term increases in salinity.

Another important factor in jarrah forest management is disease control. Much of the central and eastern jarrah forest has been largely protected from forest logging activities, and certainly from intensive logging activities, by restrictions because of the risk of jarrah dieback. Jarrah dieback is a soil-borne disease caused by the fungus *Phytophthora cinnamomi*. The present proposal is to have extensive and intensive harvesting operations in the areas once largely protected by forest quarantine restrictions.

### **Sustainable Yield**

The 1987 predictions for sustainable yield of jarrah were for a constant yield of saw mill logs until 1992, thence decreasing to about two thirds of that level by 1997. As a consequence of a re-evaluation of the jarrah forest inventory and the adoption of new definitions of acceptable grades for saw logs, CALM now proposes to maintain the 1992 levels of 1st grade sawlogs to the year 2002 and beyond, in perpetuity.

CALM also identifies in this 1992 proposal as much again of other logs or forest residue as the total identified for milling. There is no specific market identified for this product, although presumably some small part of this is to be allocated to the silicon smelter in compliance with current supply contracts. The EPA believes that there should not be a permanent on-going substantial commitment to the use of this other wood in this Timber Strategy. Such a commitment would lock the State into long term acceptance of the new forest structure and the new intensive production with insufficient flexibility to adapt management in the light of new information or changes in community expectations.

### **Precautionary approach**

The EPA recognises the excellence of the system of conservation reserves in the jarrah forest and the extension of conservation reserves in the Southern Forest Region following the review by the Australian Heritage Commission (AHC) and CALM. The EPA recognises that the system of conservation reserves provides the cornerstone of forest conservation in Western Australia. However the EPA also recognises that the present proposals for jarrah forest harvesting would see a radical restructure of the production forest outside conservation areas.

The EPA further recognises that production forestry is the major objective for use of multiple use forest outside conservation areas, and in general the CALM proposals are based on the best available research and information. None-the-less the research information relating to operational aspects of the new forest harvesting is somewhat incomplete and there is uncertainty relating to a number of issues including salinity response, the effect of the salinity response, the localised faunal impacts, and to dieback interaction with intensive harvesting, particularly in the central and eastern areas where there are higher risks of salinity impacts.

Furthermore, there is the major question about the long term community acceptability of a significantly restructured forest. The EPA has therefore recommended to the Minister for the Environment that he accept the fundamentals of the CALM proposals as a trial and places conservative caveats which allow room to adapt management should subsequent monitoring and experience show the need to adapt.

Consistent with this precautionary approach the EPA has recommended monitoring of jarrah forest harvesting activities to the satisfaction of an independent monitoring and research committee reporting to the EPA and thence to the Minister for the Environment. The EPA has recommended that funds for this monitoring and research should be provided specifically linked to the sale and contracts of all forest produce.

The establishment of an independent cross-sectoral monitoring and research steering committee is proposed because of the wide range of experience and interest in the potential impacts of the proposed intensification of jarrah forest harvesting. The steering committee approach has been used effectively in the past with regard to the impacts of bauxite mining and the woodchip industry, indeed CALM has acknowledged the benefits of such independent oversight by quoting extensively from Steering Committee Reports in its documentation.

The EPA has recommended some specific constraints to the proximity and nature of logging adjacent to streams in areas identified by the Water Authority of Western Australia where there is a high risk of salinity impact. The EPA has also recommended formalisation of objectives for and the need to define and specify the 30 per cent of jarrah forest designated by CALM for protection within each secondary catchment of the jarrah forest.

### **Recommendation 1**

**The Environmental Protection Authority concludes that;**

- i) the proposals for the karri and karri-marri forest are environmentally acceptable; and could be implemented in accordance with the recommendations in this report and the application of a precautionary approach as outlined in this report; and**

- <sup>ii</sup> the proposals in the jarrah and jarrah-marri forest are environmentally acceptable as a trial, since there are a number of uncertainties in predicting their long term environmental impacts. The Authority therefore recommends that they are implemented in accordance with the recommendations in this report and the application of the following general principles:

- a precautionary approach;
- adaptive and flexible management practices based on research and monitoring of operations;
- implementation as a trial with a reassessment by the Environmental Protection Authority after ten years (the period of the Management Plans and the Timber Strategy); and
- no commitment of all of the wood resource in the long term.

#### Conservation through reserves

To ensure that particular conservation values are protected in perpetuity, sufficient land containing those values must be protected by secure land tenure and managed effectively to protect those values. This does not mean that all of the land with those values needs to be protected by this means, but it is critical that a certain proportion of land with these values be protected in this way. This can then be supported by the protection of the values in other places through management which is sensitive to those values.

CALM has proposed substantial increases in the size and distribution of forested areas within the secure conservation estate. Many of these increases have principally focussed on the values associated with old growth forest within the Southern Forest Region, but others such as the proposed Mt Roe National Park reflect other values. Proposals have also been outlined in the Swan and Central Forest Regions. The basis for these proposals has focussed closely on their environmental attributes as well as the adequacy of representation of those values in the existing reserve system. The extension of the AHC/CALM review of national estate values into the remainder of the forest may lead to further proposals.

The increases proposed by CALM provide improved protection of conservation values.

#### **Recommendation 2**

**The Environmental Protection Authority supports the amendments to the conservation reserve estate and recommends that they be implemented.**

#### Protection of areas close to roads, river and streams

The CALM documents contain proposals for protecting other important areas and values in the forests, particularly buffers along roads, rivers and streams, as well as rare, endangered and locally restricted plant and animal species, and diverse ecosystems.

The revision of the existing system of road, river and stream reserves was forecast in 1987 by CALM. The Authority indicated its preparedness to consider a revision that provided for improved protection of environmental values within multiple use State Forest. The proposal put forward in 1992 is slightly different to that outlined in 1987. There are significant improvements to the existing system. The proposal seeks to:

- extend the system of river and stream reserves to all forested portions of the Swan, Central Forest and Southern Forest Regions;
- expand the protected reserves to all levels of streams within those regions
- retain the commitment to exclude harvesting within the river and stream reserves, and mature forest within the road reserves;

- confirm the principle objectives of the reserve system to be habitat protection, fauna linkage, water quality protection, and visual amenity;
- reduce the width of buffers along roads with identified social values; and
- provide for minimum reserve widths and recognise the importance of defining river and stream widths according to site characteristics, particularly ecological boundaries.

The Authority supports the implementation of a revised and protected system of road, river and stream reserves which is based on environmental values, including water quality and wildlife protection.

### **Recommendation 3**

**The Environmental Protection Authority recommends that the revised system of travel route (road), river and stream reserves should:**

- **be implemented, consistent with Recommendation 13 in relation to Intermediate and Low Rainfall Zones;**
- **have an effectiveness monitoring programme (see Recommendation 14);**
- **remain unharvested in perpetuity, except for those portions of regrowth forest within road zones where thinning can be undertaken in a manner consistent with the enhancement of visual objectives**

### Protection of other areas of high environmental value

Known sites within multiple use State Forest containing rare and/or endangered species of plants will be protected through management, and CALM's management proposals are intended to provide for protection of rare and/or endangered animal species. CALM has a statutory responsibility to protect animals and plants and has outlined specific objectives to achieve this. Management in State Forest to meet these objectives will include avoidance of harvesting and altered burning regime, where necessary.

Some portions of the multiple use State Forest contain sites of very high conservation value, such as wetlands, swamps, rock outcrops, and heathland. Many of these sites, which CALM has termed diverse ecotype conservation areas, have little or no timber value. Approximately 203 000ha of the karri and jarrah forest containing these sites are proposed to be protected from disturbance.

### **Recommendation 4**

**The Environmental Protection Authority supports the protection of the Diverse Ecotype Conservation areas and recommends that they:**

- **be implemented and identified on publicly available maps; and**
- **remain protected from timber harvesting and associated impacts in perpetuity.**

There are other portions of the State Forest that are important to people for many different reasons, including recreational spots, historic sites, and vantage points. In addition, other parts of the forest provide for corridors between areas of high conservation value, such as reserves or protected buffers. The Authority recognised these requirements in its WACAP Report and required CALM to address the protection and management of these special areas (EPA 1988).

CALM has proposed that, along with the revised road, river and stream reserve system, an additional 3 200ha of old growth karri forest will be protected as linkage areas or sites of high social or environmental value. However, it is very difficult for the Authority to make any judgement as to whether CALM's proposals for protecting and managing these special areas of high value old growth forest remaining within multiple use State Forest complies with the environmental conditions set on the WACAP proposal. CALM should provide information to and involve the community to demonstrate how its intentions would be applied locally.



## Recommendation 5

The Environmental Protection Authority recommends that the 3,200ha of outstanding old growth karri forest proposed by CALM for protection from logging should be identified on a regional basis and with the benefit of public involvement, and should include areas which are particularly valued by the community. These areas should:

- include those trees in Beavis, Carey and Giblett forest blocks protected from clearfelling by environmental conditions related to the Manjimup-Beenup power line proposal (EPA Bulletin 603);
- be identified publicly within three years from the adoption of the Management Plans;
- be managed to retain their social values and not be subject to harvesting in perpetuity; and
- should be subject to reporting by CALM on their implementation and management at the next Forest Management Plan review (see Recommendation 15).

CALM should retain sufficient contractual flexibility to ensure that the allocation of these areas is not excessively constrained.

## New Timber Strategy

The remainder of multiple use State Forest would be available for timber production. However, this is not to say that environmental protection and management should be restricted to protected areas. It is essential that environmental management be applied throughout the State Forest, and CALM has made proposals to comply with this objective.

When asked by the Authority to express the 1987 and proposed 1992 Timber Strategies in comparable terms CALM advised that it is very difficult to compare them because of changes in definition and improved assessment techniques. The Authority acknowledges the desirability of using the best methodology, but considers that some comparisons are essential to understand the implications of the new timber harvesting proposals. CALM needs to address comparability when introducing new resource assessment techniques so it can clearly explain to the broader community the implications of management changes.

Based on the Authority's best estimate, it would appear under CALM's proposals that the volume of jarrah logs classified as sawlogs would be harvested at a higher rate for the term of this Strategy than that proposed in the 1987 Timber Strategy. A consistently greater volume of karri sawlogs is also proposed to be available for harvesting. In addition, a substantial volume of jarrah and marri is identified for the first time as being available as residue material.

## Recommendation 6

The Environmental Protection Authority has noted that CALM's silvicultural prescriptions for the jarrah forest have been developed with incomplete knowledge of their long term consequences; and therefore concludes that the proposals to amend the 1987 Timber Strategy should be implemented cautiously. The Authority recommends that the annual sustainable yield estimates in the Timber Strategy should only be applied for the life of the Strategy (i.e. until 2002).

## Sustainable yield

The forests of the South-West represent a significant asset of the public. CALM's management plans identify the values the community expects from the forests. One of these is wood. In most of the multiple use forest, timber production is the primary objective.

The proposals represent a major change to management of both the karri and jarrah forest, especially the latter. For the karri forest, there are nominated rotation lengths for defined

portions of the forest. Outside of conservation reserves and other protected areas, there will be no current old growth forest remaining in about 40 years. In the jarrah forest, clearfelling will be the dominant regeneration treatment and this will result in a trend towards a younger forest over the first cutting cycle. As with the karri, old growth will largely disappear in the non-protected majority of the multiple use forest.

Management of the multiple use forests of the South-West must take account of the precautionary principle when specifying silvicultural practices and be applied in a flexible and adaptive manner.

#### **Recommendation 7**

**The Environmental Protection Authority recommends that the letting of wood supply contracts from the jarrah forest under the CALM Act;**

- **not commit all of the volumes in any class of log defined in the Timber Strategy for a term exceeding 10 years from 1992; and**
- **not exceed the annual levels of supply in any class of log or wood (residue) nominated in the 1992 Timber Strategy.**
- **recognise the possibility of the necessity to reduce wood supply beyond 2002 as a result of monitoring and adaptive management following the trial implementation of the jarrah silvicultural prescription.**

#### **Recommendation 8**

**CALM's inventory has identified classes of forest produce (other logs (jarrah) or forest residue (karri) in Tables 13 and 14 of the Timber Strategy) which had previously not been identified for commercial exploitation. There are uncertainties about the ecological implications of removing all of this biomass, so cautious, flexible management is warranted.**

**The Environmental Protection Authority recommends that no contract for a substantial portion of this newly identified resource should be entered into without prior referral of the proposal to the Environmental Protection Authority.**

#### **Changes to jarrah silvicultural prescription**

This Report presents the first major environmental assessment by the Authority of the management of the jarrah forest. While the karri forest has been considered at least two times previously, only elements of jarrah forest management have been considered and reported on previously by the Authority. The main issue on both occasions was mining within the forest areas.

The jarrah forest proposals involve a significant intensification of forest management, including the potential removal of volumes of wood greater than previously predicted. The proposals are very complex and interrelate closely. There is limited available information on the environmental implications resulting from the application of this jarrah forest management. This has caused the Authority to approach these proposals with some caution, and its recommendations for the jarrah forest reflect this situation.

The jarrah forest is a relatively large area, it has a wide range of site conditions and qualities, and its response to management will vary from site to site. The jarrah forest has already been subject to a variety of management strategies, from extensive clearfelling in the high rainfall zone earlier this century, to a broad harvesting regime based on selectively removing the best timber. Jarrah grows slowly in its relatively harsh natural environment. The forest has the capacity to regenerate provided external influence, including management, are not irreversible.

The Authority considers that there is sufficient information to suggest that the jarrah management proposals could proceed. However, there is a need to monitor and evaluate impacts on the environment and the attainment of silvicultural objectives in the medium to long

term. Consequently the Authority considers that the implementation of a modified jarrah forest silvicultural prescription should only apply for the normal period of the 1992 Forest Management Plans and Timber Strategy, that is 10 years. Furthermore, the impacts of the prescription need to be monitored during that period and the results presented as part of the review of the next Plans in ten years time. Monitoring should include impacts on soil and stream salinity, *Phytophthora cinnamomi* spread and management, stream and terrestrial fauna, the effect upon the litter layer and other forest components resulting from removal of the canopy, and success of habitat trees.

### **Recommendation 9**

**The Environmental Protection Authority recognises that the jarrah silvicultural prescription represents a significant change to former jarrah forest management and needs to be conservative. Therefore, the Environmental Protection Authority recommends that the jarrah silvicultural prescription should**

- **be implemented as a trial, to provide a basis for future adaptability of management. Treated sites should be dispersed throughout the range of sites and localities in the forest (see Recommendation 14);**
- **include long term monitoring which quantifies the impacts of silvicultural practices on environmental elements and values in the forest and provides bases to adjust management; and**
- **provide for the first major report on outcomes and modifications to be part of the next review of Forest Regions Management Plans and Timber Strategy, by 2002.**

### Forest ecology

Two major elements of CALM's environmental management in the jarrah forest relate to the exclusion from harvesting of a portion of most catchments for a period of time. At least 30 per cent of 2nd order catchments in the Intermediate And Low Rainfall Zones (i.e. less than 1100mm per annum) will remain unlogged for at least 15 years. Where clearfelling is the regeneration treatment, Temporary Exclusion Areas (TEAS) will be retained as buffers generally 100m wide around gaps, until they are no longer required.

These areas, which may be coincidental in part, are intended to protect water, visual resource and wildlife (i.e., movement and dispersal corridors and habitat) values.

The Authority has recommended specific management of portions of the multiple use forest, consistent with the precautionary approach, to ensure that ecological objectives are met.

### **Recommendation 10**

**The Environmental Protection Authority recommends that in the intermediate and low rainfall zones at least 30 per cent of second order catchments in the multiple use jarrah forest should be left untreated (i.e. undisturbed from harvesting, thinning, etc.) for a period of at least 15 years after harvesting or treatment of the remainder of the catchment. This untreated proportion should:**

- **include areas of multi-aged forest (including unlogged sites);**
- **be selected to emphasise wildlife, water resource and visual objectives;**
- **comprise sites with a minimum dimension of 100m: and**
- **be in addition to protected river and stream reserves and diverse ecotype conservation areas.**

**The status and effectiveness of this measure should be evaluated at the time of the next review of the Forest Regions Management Plans and Timber Strategy, by 2002 (see Recommendation 14).**

CALM has outlined management objectives for the forests which include protection of flora and fauna species and their habitat. The forms of protection range from exclusion of activities, through modification of activities to the provision of strategies aimed at allowing recolonisation following major disturbance, including habitat loss.

Within the jarrah forest, several CALM proposals relating to nature conservation were highlighted. There is the recognition of the need to retain particular types of habitat, many old trees with or having the potential for hollows and hollow logs on the ground, within areas that have been clearfelled. However, the Authority does not believe that there is sufficient research information to indicate if three retained trees per hectare are sufficient. The extension of river and stream reserves into the jarrah forest is another significant improvement. There is also the proposal to significantly reduce the presence of *Banksia grandis* (Bull Banksia) because of its link with dieback disease. The environmental implications of this have yet to be defined.

### **Recommendation 11**

**The Environmental Protection Authority recommends that the jarrah silvicultural prescription be modified in the following ways:**

- in providing for habitat trees CALM should ensure that sufficient selected trees are retained on sites subject to gap treatment which have the potential to provide this function throughout the lifecycle of the forest; and
- the reduction of the population of *Banksia grandis* be limited to specific areas with a high risk of *Phytophthora cinnamomi* impact, that a programme to identify and evaluate the environmental implications of the reduction be established as a priority, and that the results of that evaluation be subject to the next review of the Forest Regions Management Plans by 2002 (see Recommendation 14).

### Fire management

Fire has a major influence on the forest environment. It can be essential to some species at specific times of the year, and deleterious at other times and to other species. The Authority endorses CALM's commitment to the application of diverse fire regimes to meet a range of objectives. Nevertheless, submissions showed that the public continues to be concerned about the impact of fire prescriptions on the forests. This appears to be partly due to a lack of public understanding of CALM's fire management programme and the implicit judgements. Research and monitoring needs to continue on the consequences of fire to the forest, and CALM should ensure that the public is better informed about CALM's fire management.

Prescribed burns by CALM can lead to unacceptable smoke levels within urban areas. CALM's proposals include the application of more sophisticated fire management and prediction techniques. Associated with this should be better forecasting of climatic conditions, with the objective of not adversely affecting urban air quality.

### **Recommendation 12**

**The Environmental Protection Authority recommends that the fire management objectives related to the jarrah silvicultural prescription should be modified to:**

- include avoidance of air pollution in urban areas; and
- CALM should inform the public about its fire management (purposes of burns, areas burnt under different regimes of season and periodicity, escapes etc.) on a regional basis in its annual report each year.

### Salinity risk

In some catchments with high risk salt sites, harvesting could represent a significant threat to water quality. In these areas, the Water Authority has indicated that a different prescription, based on wider protected stream buffers and phased logging, should be adopted. It is not

expected that this prescription would apply to all of the salt sensitive zones, but the high risk sites need to be identified and managed accordingly.

### **Recommendation 13**

In Recommendation 10 several constraints on logging in the jarrah forest are outlined for the protection of water resources, wildlife and visual amenity. There are some sites, mostly in the Intermediate and Low Rainfall Zones (i.e. <1100mm per annum), where even with these constraints the risk of salt impacts following logging is still unacceptably high.

The Environmental Protection Authority recommends that the jarrah silvicultural prescription should be modified to provide for the identification by CALM, on advice from the Water Authority of Western Australia, of second order catchments with a high salt risk, within which

- permanently protected stream buffers, at least 50 metres wide, should be left on both sides of all streams and
- that part of the catchment which is to be left untreated as required by Recommendation 10 should be concentrated in the lower part of the catchment.

### **Monitoring and research**

For the proposed forest management to be properly evaluated as a trial, it is essential that an effective monitoring system be put in place. The scale and timing of the trial dictates that this effort, at the design, measuring and evaluating stages, be coordinated. This monitoring should be based on sound pre-logging information, to enable the identification of desirable and undesirable responses. Management should then be amended according to these findings. This means that research and monitoring should be related to operational practices.

This monitoring needs to be evaluated in time for the next major review of the forest management plans and Timber Strategy, expected in 2002. It is important that the community has an adequate opportunity to participate in this evaluation.

As with other proponents, CALM will be asked by the Environmental Protection Authority to provide reports from time to time on its compliance with the environmental conditions.

### **Recommendation 14**

The Environmental Protection Authority recommends that a Forest Monitoring and Research Committee be established. The Committee should;

- have objectives which include the identification and approval of monitoring and research programmes and projects on environmental impacts of forestry management, granting of funds towards such research, receipt of progress reports, reporting to the Environmental Protection Authority and publication of results;
- be established within 12 months;
- be funded principally from the proceeds of native forest product sales; and
- give brief annual progress reports to the Authority, with major reports in 1997 and 2002, at the time of the next review of Forest Management Plans and the Timber Strategy. The Authority shall report to the Minister for the Environment following the receipt of each major report.

### **Recommendation 15**

The Environmental Protection Authority recommends that CALM provide brief annual progress reports to the Authority, and major public reports in 1997 and 2002, on compliance with the environmental conditions.