

Implementing Ecologically Sustainable Forest Management

**An Explanatory Paper by
the Conservation Commission
of Western Australia
to accompany
the proposed Forest Management Plan
2004-2013**

September, 2003

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Contents

Executive Summary	1
1. Purpose of this Explanatory Paper	3
2. How the proposed FMP was developed.....	4
2.1 The Government's policy position	4
2.2 The new starting point – ESFM	5
Sustainability principle	5
Precautionary principle	6
Intergenerational equity principle	6
Biodiversity principle.....	7
Efficiency principle.....	7
2.3 How the proposed FMP links to on-ground implementation of ESFM.....	8
2.4 Social and economic issues	9
3. The Conservation Commission's overall approach.....	10
3.1 ESFM complementing CAR	10
3.2 Fauna Habitat Zones.....	11
3.3 Resourcing the implementation of ESFM.....	14
4. Response to Key Issues raised in Submissions.....	14
4.1 Identification and management of old-growth forest	15
4.2 Identification and reservation of high conservation value forest.....	17
4.3 The inclusion of regrowth forest in formal conservation reserves.	18
4.4 Additional reservation sought in submissions	18
4.5 Ecologically sustainable forest management	21
4.6 Silviculture	24
4.7 Determining the sustained yield of timber	26
4.8 Craftwood and salvage logs	29
4.9 Utilisation and pricing of logs.....	29
4.10 The social and economic study	31
4.11 Enforceability.....	31
5. Enforceability of the approved FMP	31
6. Conclusions and Recommendations.....	32
References.....	34

Executive Summary

This Explanatory Paper is an accompaniment to the proposed Forest Management Plan 2004-2013 (the proposed FMP) which has been prepared by the Department of Conservation and Land Management (the Department) for the Conservation Commission of Western Australia under the requirements of Part V of the *Conservation and Land Management Act 1984* (the CLM Act).

In its policy document *Protecting our old-growth forests* the Government outlined a major change of approach to the management of the State's jarrah and karri forests. This included commitments to end logging of old-growth forests, establish a large number of new parks and reserves, and manage the State's forests in accordance with the principles of ecologically sustainable forest management (ESFM).

Under section 19 of the CLM Act, the Conservation Commission has the function of advising the Minister on the application of the principles of ESFM to the management of State forest, so there is both statutory support and a policy imperative that the proposed FMP be consistent with the principles of ESFM.

The principles of ESFM are directed at the conservation of biological diversity and ecological integrity while ensuring that social and economic needs are also considered. An important focus is on providing for a value-added timber industry that is truly sustainable in both the short and long-term. To move to management practices that are clearly sustainable will require significant change.

This process of change can create difficulties for all those involved in the timber industry and the management of the State forest, especially given the length of the management planning process. In framing the proposed FMP the Conservation Commission has been acutely aware of those difficulties.

The Conservation Commission has recommended a management system to ensure on-the-ground delivery of the proposed FMP, through a series of subsidiary management guidelines, with key performance indicators monitored, evaluated and responded to for the delivery of continuous improvement.

The subsidiary management guidelines will be prepared or reviewed with public consultation.

In addition, the Conservation Commission will audit implementation of the approved FMP, focusing on key areas.

The adoption of ESFM has required a new approach, where the ecological sustainability of the management of the forest is the starting point. This then determines the ecologically sustainable level of timber extraction, with adjustments made to moderate the social and economic implications, and to develop a balanced FMP.

Submissions showed that there are differing views about whether or not the existing formal reserve system (with proposed additions) is truly comprehensive, adequate and representative. Additional biological surveys have been proposed as the next step in addressing this issue.

With proposed additions to the formal reserve system provided for in the proposed FMP, over 90% of old-growth forest will be protected in such reserves. For the remainder, within State forest, it is proposed to ensure protection through the informal reserve system and management prescriptions applied to the adjacent production forest. The preparation of Guidelines for the Management of Informal Reserves has been proposed to provide more details in this area.

In the proposed FMP, the Conservation Commission has largely focused on improvements to the management of the production forest to complement the formal reserve system with the broad objective of biodiversity returning to pre-logging levels within one rotation.

The Conservation Commission considers that to apply the ESFM principles in production forest means to accept an inevitable short-term loss of fauna, but that fauna should return to pre-logging levels within one rotation. To accept anything less could lead to a downward spiral towards the local extinction of vulnerable species. On the basis of expert advice on the protection of fauna, especially arboreal species, the proposed FMP includes the retention of fauna habitat zones (FHZs) of at least 200 hectares, within the production forest. These can and should be integrated and linked with the river and stream zones and other elements of the informal reserve system in the production forest thereby reducing their impact on timber yield.

The implementation of the proposed FMP, with its improved monitoring, reporting and auditing provisions, will require additional resources. This is the necessary cost of applying the principles of ESFM.

There has been a lot of interest in the enforceability of the approved FMP. It is a high-level document, and deliberately gives the implementing agencies (largely the Department and the Forest Products Commission) some discretion in on-the-ground implementation of the FMP. However, there is also a community expectation that these agencies are accountable for their implementation of the FMP. This would involve the Conservation Commission as auditor.

The proposed FMP represents a balanced package, implementing the principles of ESFM. It would be possible to adopt a different position that sought to provide a greater level of ecological protection or a greater level of timber production, but not without compromising the achievement of ESFM.

1. Purpose of this Explanatory Paper

This Explanatory Paper is an accompaniment to the proposed Forest Management Plan 2004-2013 (the proposed FMP) which has been prepared by the Department of Conservation and Land Management (the Department) for the Conservation Commission of Western Australia under the requirements of Part V of the *Conservation and Land Management Act 1984* (the CLM Act).

Section 19(1) of the CLM Act lists the Conservation Commission's functions, including:

- (h) to advise the Minister on the application of the principles of ecologically sustainable forest management in the management of –
 - (i) State forest and timber reserves; and
 - (ii) Forest produce throughout the State.

This Explanatory Paper is in partial fulfillment of this function. It also seeks to explain to stakeholders how the Conservation Commission has taken their submissions into account in reaching its recommended positions, and the considerations behind those positions.

This is the first Forest Management Plan since the Conservation Commission was established, under amendments to the CLM Act in November 2000, with new powers, functions and responsibilities, including the above statutory function of advising the Minister on the application of the principles of ecologically sustainable forest management (ESFM). It is also the first plan since the Government commenced implementation of its *Protecting our old-growth forests* policy, leading to major changes in forest management, including the stopping of logging in old-growth forests. To that extent the proposed FMP marks an important transition from a forest management regime that included logging in old-growth forests to one based on regrowth and two-tiered forests only.

It is important that readers of the proposed FMP have a clear understanding of these changes and the reasoning behind the decisions the Conservation Commission has taken, including the changes made in response to submissions received.

The first report of the Independent Panel on Calculating Sustained Yield for the Forest Management Plan 2004-2013 (the Independent Panel) recommended (Ferguson *et al.* 2001):

As part of the process involved in preparing the next Forest Management Plan, the Conservation Commission should ensure that recent changes in Government policy, the principles of Ecologically Sustainable Forest Management, and the key elements supporting the planning process and calculation of yield are widely promulgated and understood (Recommendation 2.1).

This Explanatory Paper will assist in meeting this recommendation.

The proposed FMP has been prepared under the requirements of Part V of the CLM Act, wherein the contents of an FMP are specified in Section 55. The Conservation Commission considered that while the scope of an FMP as specified in the CLM Act was

appropriate for its statutory purpose; it did not permit the necessary explanation of the wider context or the Conservation Commission's reasoning.

This Explanatory Paper has been prepared to accompany the proposed FMP to provide that wider context. A detailed Analysis of Public Submissions on the Draft FMP has also been prepared (Conservation Commission 2003). The final (Stage 3) report of the Independent Panel is also available (Ferguson *et al* 2003).

2. How the proposed FMP was developed

2.1 The Government's policy position

In its policy document *Protecting our old-growth forests* the Government outlined a major change of approach to the management of the State's jarrah and karri forests.

This policy acknowledges that "Western Australia's old-growth forests are an irreplaceable community asset" and commits to "the full protection of all our remaining old-growth and high conservation value forests" and "a holistic approach to forest policy".

Specific policy commitments include –

- immediately end logging in nearly 99 per cent of Western Australia's old-growth forests and place a moratorium on the remaining one per cent while reviewing forward logging plans and timber contracts;
- create 30 new national parks, covering approximately 200,000 hectares of new reserves and approximately 150,000 hectares of previously promised reserves, reinstate 17 revoked reserve proposals and reserve "icon" old-growth forests; and
- manage the forests in line with the principles of ecologically sustainable forest management (ESFM).

The first of these commitments has been implemented, including the Government's decision of November 2001 to also protect the one per cent of old-growth forests. Logging of old-growth forests has ceased both in those areas proposed for formal reservation and in those areas that will be protected through informal reserves. The second commitment is the subject of a long-term project under which the detailed design of the proposed parks and reserves is progressing with stakeholder consultation. Where feasible, reserve boundaries are being adjusted to include adjacent old-growth forests and, as a result, over 90 percent of old-growth forests will be in the formal reserve system with the remainder protected in informal reserves.

With regard to the third commitment, with the expiry of the FMP 1994-2003 (Department of Conservation and Land Management 1994) this year, the requirement for a new FMP provides a timely way to give effect to the Government's new policy.

The CLM Act now gives specific acknowledgement to the principles of ESFM. The Conservation Commission has therefore taken seriously the challenge of moving forest management into a new era. This new era will be based upon knowledge gained from past management practices and the progressive improvement of those practices.

The principles of ESFM are not solely directed at the conservation of biological diversity and ecological integrity, but also at ensuring a timber industry that is truly sustainable in both the short and long-term.

2.2 The new starting point – ESFM

Section 19(2) of the CLM Act lists the principles of ESFM as:

- (a) that the decision-making process should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations (the *sustainability principle*);
- (b) that if there are threats of serious or irreversible environmental damage, the lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation (the *precautionary principle*);
- (c) that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations (the *intergenerational equity principle*);
- (d) that the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making (the *biodiversity principle*); and
- (e) that improved valuation, pricing and incentive mechanisms should be promoted (the *efficiency principle*).

The decision-making process the Conservation Commission has used to develop the proposed FMP has given effect to these principles in the following ways.

Sustainability principle

The Draft FMP (Conservation Commission 2002a) presented two scenarios for public consideration. These presented alternative balances between conservation and socio-economic objectives, and were defined by varying different settings ranging from additions to the formal reserve system, the inclusion or not of mature habitat zones (now known as fauna habitat zones), to the allowances made for the spread and impact of *Phytophthora cinnamomi* (dieback). In inviting submissions on the Draft FMP the Conservation Commission encouraged people to comment on their preference for one of the scenarios, or a modification thereof. These submissions have now been considered and used to guide changes to the development of the proposed FMP.

The process adopted by the Commission has involved the development and refinement of management objectives and actions designed to ensure the conservation of biological diversity and ecological integrity and the maintenance or enhancement of health, vitality and productivity.

Through an iterative process the Commission has integrated both long-term and short-term economic, environmental, social and equitable considerations by requesting from the Department the modeling of variations to the scenarios beyond those described in the Draft FMP.

In this way, the cumulative impact of conservation measures on social and economic factors was identified and mitigated through amendments to the Draft FMP's

management actions. As a result, the proposed FMP represents, in the Commission's judgement, an effective integration of forest conservation and the various uses to which the forest is put, consistent with the sustainability principle. Later in this Explanatory Paper more specific details on how this integration was achieved can be found.

Precautionary principle

The precautionary principle is about decision-making under uncertainty. Considering the many variables associated with long-term forest management, it is a highly relevant tool. Again, the approach was to present the two scenarios (A and B) in the Draft FMP, representing different responses to uncertainty, and to seek comment on these.

One issue raised in the submissions in relation to the application of the precautionary principle was that the wording of that principle implies that the principle should only be applied "if there are threats of serious or irreversible environmental damage".

The submissions questioned whether the Conservation Commission has applied the principle too readily, without first clearly establishing that there are indeed "threats of serious or irreversible environmental damage". Applying the precautionary principle has significant social and economic consequences so it was not surprising that the Draft FMP was questioned in this way.

It is clearly a matter of judgment whether or not a "threat of serious or irreversible environmental damage" exists. The CLM Act (section 19(1)(h)) gives the Conservation Commission the task of advising the Minister on the application of the principles of ESFM and, by implication, interpreting them as they apply to the management of State forest, timber reserves and forest produce. The Conservation Commission has therefore exercised its judgment in the degree of precaution to be applied acknowledging the many natural and human induced changes to which the forest is subject, and adopting a prudent approach to management in the light of the progressive juvenilisation of the forests.

Submissions commented on both Scenarios A and B, as outlined in the Draft FMP. The Conservation Commission has used those responses in developing the proposed FMP in addition to the results of research and modeling to determine a final position that gives consideration not just to the precautionary principle but also to the sustainability principle.

Another tool in managing uncertainty is the initiation of adaptive management trials, where trials of forest management practices will be conducted and, where appropriate, applied more widely. This approach is separate from, and additional to, the normal monitoring and review processes built in to the proposed FMP.

Intergenerational equity principle

To be consistent with this principle, the proposed FMP must leave the health and productive capacity of the forest in at least as good a state as it found them. The principles of ESFM are closely inter-linked, therefore this principle can only be achieved if the biological diversity of the forest is maintained and soils protected from damage. In the long-term it is threats such as the spread and impact of *Phytophthora cinnamomi* and climate change that will need careful attention. The proposed FMP provides actions to address these issues.

The future productive capacity of the forest will require additional resources to be made available to implement the necessary management practices. For example, the proposed FMP commits to a schedule of thinning to ensure acceptable stand improvement. The implementation of commitments such as this are essential to the delivery of the sustained yield of sawlogs. Some forest uses, such as mining, are non-renewable, but for the rest, the Conservation Commission has sought, through the sustainability, precautionary and biodiversity principles to ensure that the proposed FMP is consistent with the principle of intergenerational equity.

Biodiversity principle

The National Strategy for the Conservation of Australia's Biological Diversity (Commonwealth of Australia 1996) contains nine principles for conserving biological diversity, two of which are directly relevant to the implementation of the biodiversity principle:

1. Biological diversity is best conserved *in-situ*.
8. Central to the conservation of Australia's biological diversity is the establishment of a comprehensive, representative and adequate system of ecologically viable protected areas integrated with the sympathetic management of all other areas, including agricultural and other resource production systems.

The second of these has two elements. The first element is a comprehensive, adequate and representative (CAR) reserve system. The second element is a requirement for management practices in the production forest to be sympathetic to the need to conserve biological diversity.

The proposed FMP approaches the first element by providing for the implementation of the proposed additions to the formal reserve system. As explained below, there is a need for additional data before a judgment can be made about whether or not the reserve system, with those additions, meets the CAR criteria (Commonwealth of Australia 1997), and if not, what adjustments are required. To address this need for data the proposed FMP includes an action to undertake additional biological surveys, as resources permit.

The proposed FMP approaches the second element by ensuring that operations in the production forest are consistent with the principles of ESFM. This means, for example, that there are areas within the production forest that are not logged in the short, medium or long-term. These areas (for example, temporary exclusion areas, fauna habitat zones and informal reserves) are protected by management, and they provide for the protection of many forest values. The proposed FMP also provides better protection than in the past for understorey species in areas subject to logging.

Efficiency principle

Once the other principles have established the objectives of the proposed FMP, it is consistent with those principles that implementation of the proposed FMP be as efficient as possible.

One aspect of achieving greater efficiency is to ensure that the right economic messages are being sent to the participants in the various markets. The implementation of the proposed FMP will need to encompass a number of valuation, pricing and incentive measures for the timber industry. It is important that these convey the true costs of the policies adopted.

Further advice regarding this principle will be provided to the Minister for the Environment in the future.

2.3 How the proposed FMP links to on-ground implementation of ESFM

The proposed FMP is a high-level strategic document. This is reflected in the objectives for the management of the forest applying at the whole-of-forest, landscape and operational scales, and actions consistent with those objectives.

To ensure the effective on-ground implementation of the FMP the Conservation Commission has adopted the management model shown in Figure 1.

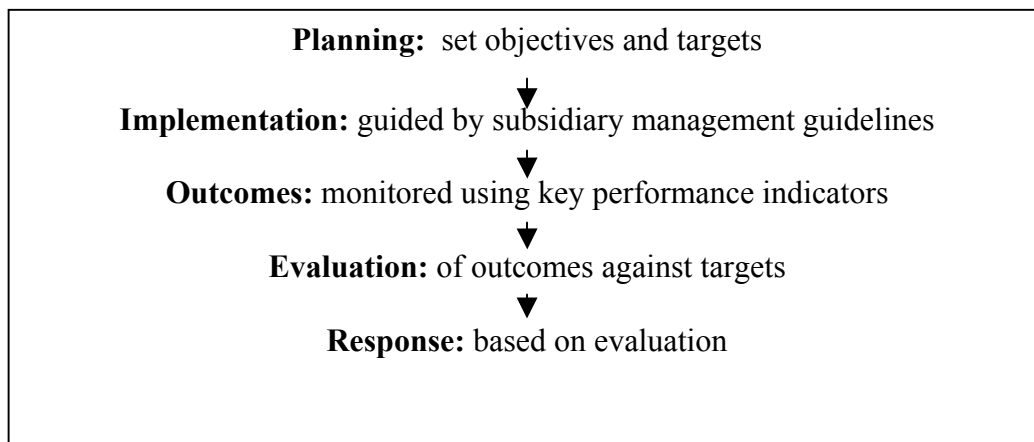
Under this model the Department will prepare or review, as required and with public consultation, a set of subsidiary management guidelines that clearly detail the actions required to deliver the objectives in the proposed FMP.

The Conservation Commission will be consulted and its advice sought as these subsidiary management guidelines are developed, to ensure that they are consistent with the proposed FMP and the Conservation Commission's interpretation thereof. Details of the requirements that these guidelines must meet are provided in the appendices of the proposed FMP.

These subsidiary management guidelines will then be implemented by the Department, the Forest Products Commission and the various contractors in the day-to-day management of the forest.

The proposed FMP includes a series of key performance indicators (KPIs). Using these, forest management outcomes will be monitored. The results of this monitoring will be evaluated against targets specified in the proposed FMP. Any shortfalls will be reported to the Conservation Commission and responded to as appropriate.

Figure 1: Continuous improvement model (after Raison *et al.* 2001)



At several of the public forums people questioned the approach of using KPIs as they are clearly a simplification and do not tell the whole story. The Conservation Commission accepts this point, but also considers KPIs to be a valuable guide for forest management. However, the use of KPIs does require supplementation in various ways. For example, the comprehensive monitoring system, FORESTCHECK (Department of Conservation and Land Management 2000), will be continued. Auditing, focused on significant issues, will be undertaken by the Conservation Commission, in addition to a detailed, comprehensive mid-term review.

An important element of the audit function is publication of the results, including performance outcomes against the KPIs and compliance with the subsidiary management guidelines, providing for enhanced public accountability.

Further, the Environmental Protection Authority (EPA) maintain a review role following environmental assessment of the proposed FMP under the *Environmental Protection Act 1986* (EP Act).

2.4 Social and economic issues

The Conservation Commission considers that the best way to ensure the long-term future of the timber industry is to ensure that the level, and method, of timber extraction is truly sustainable and will remain so in the long-term. The Conservation Commission is convinced that a sustainable level of timber extraction will ensure a more secure future for the industry overall.

Previously, forest management was, to some extent, driven by timber supply contracts. These determined how much timber had to be extracted from the forest, and operations were moderated by practices to reduce the environmental impacts of the contracted level of timber extraction. At times in the past an allowable cut greater than the sustained yield has been approved.

The adoption of ESFM has required a new approach, where the ecological sustainability of the management of the forest is the starting point. This then determines the ecologically sustainable level of timber extraction, with adjustments made to moderate the social and economic implications, and to develop a balanced FMP.

In this process of integration, the social and economic importance of the sawmilling and furniture industries, particularly to the Manjimup area, has been an important consideration for the Conservation Commission.

The use of gap creation and shelterwood techniques in the higher productive jarrah/marri forest is based, in part, upon the need to ensure effective jarrah regeneration for the long-term future of the timber industry.

The Conservation Commission considers that the proposed FMP represents the balanced position required by the principles of ESFM. A change to increase timber yield, for example, could only occur at the expense of, say, biodiversity in a way that would be inconsistent with the principles of ESFM. Equally, it would be possible to further restrict timber harvesting activities in the interests of the environment, but the Conservation Commission considers that to do so would be inconsistent with the requirement, under

the sustainability principle to integrate “economic, environmental, social and equitable considerations”.

3. The Conservation Commission’s overall approach

3.1 ESFM complementing CAR

As noted in Section 2.2, the National Strategy for the Conservation of Australia’s Biological Diversity lists the eighth principle for conserving biodiversity as:

Central to the conservation of Australia’s biological diversity is the establishment of a comprehensive, representative and adequate system of ecologically viable protected areas integrated with the sympathetic management of all other areas, including agricultural and other resource productions systems.

The formal reserve system includes nature reserves, national parks, conservation parks and reserves with a conservation purpose referred to in section 5(1)(g) and (h) of the CLM Act.

The Government’s *Protecting our old-growth forests* policy proposed many additions to the formal reserve system. In addition there are a number of reserves that were proposed in the 1987 Regional Forest Management Plans (Department of Conservation and Land Management 1987), the 1994-2003 Forest Management Plan (Department of Conservation and Land Management 1994) and the Regional Forest Agreement (Commonwealth of Australia and State of Western Australia 1999), but not yet gazetted. The proposed FMP provides for these reservations being finalised, subject to refinement of their boundaries after consultation with Government agencies, local governments and the community.

The Conservation Commission has reviewed the existing and proposed formal reserve system and considers that on the basis of present knowledge the formal reserve system proposed by the FMP is sufficiently comprehensive, adequate and representative for the majority of forest ecosystems. Consequently emphasis can shift in part to the implementation of the principles of ESFM throughout the forests.

However, decision-making about the CAR reserve system is presently constrained by the adequacy of biological data. The present reserve system is based largely on floristic assemblages (communities of flowering plants) and may not be fully comprehensive, adequate or representative for other parts of the biota. In addition, some minor adjustments may be required to produce the best system possible. However more complete biological information across a broader range of taxonomic groups is needed to underpin any review of the reserve system.

The proposed FMP therefore proposes targeted biological surveys to address the most significant information gaps and develop a more comprehensive information base, as a necessary precursor to further development of the formal reserve system in the plan area. As the information becomes available, it will be possible to determine whether there is a need for a more general review of the CAR criteria and reserve system. Any review will therefore not be possible in the short-term, and even then will need to take

place under an agreed set of assumptions designed to reduce the risk of community conflict being re-ignited. For example, assumptions regarding the net area and conservation value of the formal reserve system and the sustained yield of sawlogs will need to be set as fixed outcomes of any review.

In the meantime, the implementation of ESFM will protect biodiversity values outside of the formal reserve system. This will occur through the informal reserve systems for old-growth forest, river and stream zones, travel route zones, diverse ecotype zones, other informal reserves, and the fauna habitat zones.

3.2 Fauna Habitat Zones

The implementation of the Forest Management Plan 1994-2003 has been subject to conditions of approval set by the Minister following environmental assessment under Part IV of the EP Act. Condition 11.1 required the Department to monitor the environmental impacts of silvicultural treatments applied to jarrah forests. It has been incumbent on the Conservation Commission to respond to the findings of this monitoring.

To inform its report to the Environmental Protection Authority on implementation of the Forest Management Plan 1994-2003 the Department sought the advice of an expert panel chaired by Dr Neil Burrows. This Panel reviewed relevant research on possible impacts of the management regime.

In the first of its two reports, the Burrows Panel reviewed research and monitoring on the environmental impacts of silvicultural treatments in the jarrah forest and made a number of management recommendations (Burrows *et al* 2001). It observed:

The studies carried out as part of the Kingston Project have shown that ground dwelling fauna (invertebrates and vertebrates) appear little affected by logging and associated burning activities. However, logging has had some short-term adverse impacts on some arboreal fauna.

and recommended that:

There is good evidence for retaining a portion of the forest block as uncut, or with mature characteristics to provide refuge for birds and mammals that require this type of habitat... Western Ringtail Possums have a home range of about 3-5 ha, and using this species as an indicator, retaining mature (or old growth) patches of about 200ha (minimum) in a matrix of regrowth forest on a forest block, preferably continuous or connected (e.g. creek lines) should be considered until better information is available.

This is the origin of the mature habitat zones included in Scenario A of the Draft FMP and now included in the proposed FMP as fauna habitat zones.

The formal reserve system in Western Australia has been built up and added to partly by opportunistic acquisitions and partly through targeted acquisitions based on vegetation and flora values. Fauna values have received relatively less attention.

The targeted biological surveys will eventually enable the Conservation Commission to assess the adequacy of the formal reserve system for a wider range of values.

The Conservation Commission considers that to apply the principles of ESFM in production forests means that an inevitable short-term loss of fauna must be accepted, but that fauna should return to pre-logging levels within one rotation. To accept anything less could lead to a downward spiral towards the local extinction of vulnerable species.

The re-establishment of fauna in harvested areas depends on re-colonization from adjacent unharvested areas. Because of the uneven distribution of much fauna in 'hot spots' within the production forests, a network of fauna habitat zones at the landscape scale is a more appropriate strategy than a similar area of additional formal reserves in only a few locations.

The Conservation Commission also notes that the response of fauna to multiple disturbances is not well understood.

It is clear from the above considerations that these zones will perform a valuable function, and therefore they have been included in the proposed FMP.

In reviewing the proposal in Scenario A of the Draft FMP for a system of mature habitat zones, the Conservation Commission recognised that further work was needed to refine the proposal before it might be adopted. The refinement process has included an analysis of the public comments received in submissions in response to the Draft FMP, a series of workshops with a range of fauna experts, and consideration of the consequences of implementing the zones for the sustained yield of timber.

The workshops supported the concept of mature habitat zones. There was widespread agreement from the workshops that forest structure and floristics should not be a key selection element for the proposed zones, as these criteria have been used in the design of the existing and proposed formal reserve system and may not be the best indicator of fauna habitat value. It was agreed that it was better to distribute the zones across the landscape so that they could provide a range of habitat types for a broad range of fauna, although retaining an emphasis on mature, hollow-bearing trees as a key habitat element. In view of this development, the zones are now known as fauna habitat zones.

The Commission notes that a significant proportion of blocks contain less than 10% of mature forest and native vegetation within formal and informal reserves. Bradshaw (2002) reports 111 out of 399 blocks with between 1 and 10% as at December 2000. Some of these blocks will, of course, be affected by the proposed additions to the formal and informal reserve system. Nevertheless, the fauna habitat zones are required to ensure that additional forest with mature characteristics is maintained at the landscape (block) scale to meet biodiversity objectives and ESFM.

In proposing this landscape scale network of fauna habitat zones the Commission explored two separation distances between individual zones, and between a zone and formal and the larger informal reserves. The distances used were 2km and 3km. While the Commission was advised that a 2km separation was preferred on scientific grounds, a separation distance of 5km was canvassed in one of the options put forward in Burrows *et al.* (2002). Initial modeling based upon a 2km separation produced a network with little room to adjust the location of individual zones to produce the optimum outcome

for biodiversity and reduce the impact on sustained yield. In consideration of these matters the Commission settled on a 3km separation (as an average, with a range from 2-4km allowed).

On the basis of a 3km separation, a systematic distribution of fauna habitat zones identified 71,430ha of additional forest unavailable for timber harvesting. This area has been scaled back to between 50,000 and 55,000ha as a result of an initial review of the value of and need for individual fauna habitat zones. The network can be adjusted to complement existing formal and informal reserves better than the geographic distribution has done. For example, where there is an ample network of river and stream buffer zones the fauna habitat zones should be located higher in the landscape to sample upland habitat. In some portions of State forest and timber reserves over 20% of the area is already contained within existing and proposed formal and informal reserves. Fauna habitat zones may be less important in these areas.

Given the distribution of habitat values and the pattern of past cutting, mining and dieback extent, a hierarchy of preferences for selecting the zones will be applied iteratively as outlined in Appendix 4 of the proposed FMP.

Progressive examination of each block on a case-by-case basis and informed by ground data is appropriate as part of harvest planning. In this way the shape of each zone and its location in the landscape can be refined, taking into account operational considerations, such as the need for ready boundary identification in the field. This process will be set out in the Guidelines for the Selection and Management of Fauna Habitat Zones.

In arriving at its final proposal for the network of fauna habitat zones, the Conservation Commission sought to mitigate the impact on the sustained yield of timber, and hence on social and economic values.

The Independent Panel (Ferguson *et al.* 2003) expressed the view that fauna habitat zones should not be implemented until further work has been done to clarify the rationale for them and aspects of their selection and management. The proposed FMP has addressed the issues raised by ensuring that they are responded to within one year of commencement of the plan. The proposed FMP commits to the preparation of Guidelines for the Selection and Management of Fauna Habitat Zones. The Commission is of the view that this commitment provides an acceptable means to respond to the issues raised by the Independent Panel. To delay implementation of these zones until the guidelines have been completed and approved would be at odds with the precautionary principle, especially given the risk that implementation may then be difficult to achieve before the end of the period of the new plan if a sawlog volume that is dependent on logging in the zones has been committed. The alternative would have resulted in further juvenilisation of the forest at a landscape scale with consequential threats to arboreal species.

The fauna habitat zone strategy is one component of a forest management regime based upon a hierarchy of measures ranging from formal reserves, through informal reserves, to the fauna habitat zones themselves and temporary exclusion areas, ending with the retention of habitat elements such as hollow-bearing trees. In this way a variety of fauna habitat can be sampled and protected at the whole-of-forest and landscape scales.

More detail can be found in Appendix 4 in the proposed FMP.

3.3 Resourcing the implementation of ESFM

The implementation of ESFM, as outlined in the proposed FMP, involves additional planning considerations, data requirements, trials, supervision, monitoring and auditing. This higher level of management will be more resource intensive than in the past.

The Government's *Protecting our old-growth forests* policy identifies the irreplaceable asset that the State's forests represent and the fact that parts of the community have lost faith in the way this asset has been managed.

If this community faith is to be restored, and the outcomes of the policy are to be delivered and seen to be delivered, it is essential that adequate resources are directed towards the management of the forest, and the new monitoring and reporting arrangements. While the Conservation Commission acknowledges the many demands placed upon public expenditure, it nevertheless recommends in the strongest terms that additional resources be provided. These resources should not be drawn from those currently available for biodiversity conservation throughout the remainder of the State where threats are in many cases higher. That is, new resources are required from the public and private sectors.

Consistent with the principle of full life-cycle costing, it is reasonable for those who consume forest products to bear some of the cost of this improved management. However, many of the values protected by the proposed FMP are conserved on behalf of all Western Australians, and it is therefore also reasonable that some of the additional costs should be met from general revenue.

The Conservation Commission sees this issue as central to the effective implementation of the approved FMP.

4. Response to Key Issues raised in Submissions

The development of the proposed FMP has benefited from the input of a large number of public submissions. The first stage of public consultation was a series of public forums held in 2001. The next stage was in response to the Discussion Paper (Conservation Commission 2002b). Some 129 submissions were received, and the preparation of the Draft FMP was guided by the views expressed.

The most extensive stage of consultation was on the Draft FMP supported by a further series of public forums. Again there was a high level of interest among stakeholders and a total of 5,600 submissions were received (including 4,686 pro-forma submissions). A tabulation of over 800 of the issues raised has been prepared with responses (Conservation Commission 2003).

In this section the key issues are discussed in more detail.

4.1 Identification and management of old-growth forest

Definition of old-growth and its identification in the field.

Submission comments – There was considerable opposition to the criteria for defining old-growth, particularly with respect to the disturbance criterion infested with dieback and presence of “one or two” stumps that disqualify mature forest from being classified as old-growth. In addition, submissions expressed disquiet with the reduced area of old-growth forest reported in the Draft FMP from that stated in the *Protecting our old-growth forests* policy and the Department’s role in the remapping that contributed to that loss. Many submissions sought an independent review of old-growth mapping.

Conservation Commission response – The Conservation Commission has used criteria accepted by Government to define the extent of old-growth forest for the Draft and proposed FMPs. The Conservation Commission does not intend to undertake a comprehensive review of the extent of old-growth forest as it would appear that much of the concern about the accuracy of the current mapping relates to the criteria used rather than the application of those criteria. In addition it would be prohibitively expensive to do so.

The figure of 346,000 hectares of old-growth quoted in the *Protecting our old-growth forests* policy was derived from figures contained in the 1998 Comprehensive Regional Assessment (CRA) report (Commonwealth of Australia and State of Western Australia, 1998), with a nominal estimated discount to allow for the logging of old-growth forest that continued until February 2001.

The total area of old-growth forest within the forest ecosystems listed in the CRA report was 347,303 hectares. However, this included old-growth forest in the Department’s South Coast Region and on private land, consequently of the total area of old-growth forest given in the CRA report, the area of old-growth forest on public land within the same boundary as specified in the Draft FMP was 345,900 hectares. While the CRA report relied on harvest records to December 1997, it was based on actual harvest records to December 1996 and the presumption that all the coupes on the 1997 indicative harvest plan would be harvested. In practice this did not occur.

The Draft FMP, released in August 2002, reported the area of old-growth forest on public land within the plan area as 333,100 hectares (rounded to nearest 100 hectares), based on data as at December 2000. Old-growth forest area data have since been updated to reflect the situation as at December 2001, and the area reported in the proposed FMP is 331,500 hectares. The reduction of 14,400 hectares from the 345,900 hectares assumed to be in the plan area at the time of the CRA report is broadly accounted for as follows:

- Harvesting during the term of the previous Government, from January 1998 to immediately prior to the 2001 election reduced the area by 4,500 hectares.
- Refinement of records, including the reinstatement of those areas planned, but not harvested in 1997. The net result is a reduction of 5,800 hectares.
- Reclassification of dieback status leading to a reduction (net result) of 4,100 hectares.

The net reduction in old-growth forest area due to reclassification of dieback status has resulted from refinements affecting over 90 forest blocks that ranged from one hectare to a thousand hectares.

The loss of old-growth through logging ceased in early 2001. The Conservation Commission understands that there is likely to be little further change in the area identified as old-growth due to the refinement of records. However, the proposed FMP provides for any variations to be a matter of public record. The Conservation Commission remains concerned that the spread of dieback will remain an issue, both of significance in its own right and because of its implications for areas presently free of the pathogen and identified as old-growth. This important issue is presently under review. The proposed FMP will be amended as appropriate prior to its formal transmittal to the Minister for the Environment for approval under the CLM Act.

However, as individual areas of forest are subject to timber harvesting the current mapped extent of old-growth forest will be subject to on-ground review. This process will result in both additions and deletions to the extent of old-growth forest.

Inclusion of old-growth forest in formal reserves

Submission comments – Many submissions commented on the need for full protection of old-growth forest and that it should ideally be in formal conservation reserves. Particular mention was made of the need for adjacent formal reserves to be expanded to include old-growth in State forest in the following forest blocks: Bell, Bidella, Bottlebrush, Central, Mattaband, Red Gully, Rocky, Rosa, Russell, Spring and Telerah.

Conservation Commission response –The Department uses the following criteria in drawing the indicative boundaries of proposed reserves. The selected boundary should: capture the areas nominated in the *Protecting our old-growth forests* policy; capture as much mapped old-growth forest that is adjacent to the nominated areas as is considered reasonable; utilise operationally suitable existing management boundaries; and exclude regrowth forest wherever sensible.

Therefore, where old-growth forest occurs close to the nominated boundary of a proposed reserve and a suitable management boundary can be used to capture it that did not at the same time include an excessive amount of non-old-growth forest available for timber production, then the old-growth forest will be included in the reserve. Old-growth forest was not included where it was too far from the boundary of a proposed reserve, where there was no suitable management boundary to use to add the old-growth forest to an adjacent formal reserve and where the old-growth forest was mixed with a significant portion of non-old-growth forest. This approach has resulted in 91 per cent of the current mapped extent of old-growth forest being in a formal reserve although this level may rise as the finalisation of reserve boundaries is not yet complete. Those areas of old-growth forest falling outside of the final reserve boundaries will remain protected as informal reserves.

With respect to the forest blocks mentioned in submissions, using the above criteria:

- Bell has no more old-growth forest suitable for addition to the adjacent formal reserves.

- Additional old-growth forest was recommended to be included in adjacent formal reserves for Bidella, Red Gully and Central in the Conservation Commission's advice to the Minister for the Environment (Conservation Commission 2002c) when responding to the report of the assessment of high conservation value forest by Ecoscape Australia (2002).
- Bottlebrush, Rosa and Telerah had additional old-growth forest recommended to be included in the adjacent formal reserve when the reserve design was finalised.
- With Mattaband, one side is adjacent to the Walpole Wilderness Area, which has been subject to a public consultation process. The other sides of Mattaband and Spring blocks are respectively adjacent to, and part of, the proposed Lake Muir National Park for which fine scale reserve design is yet to be undertaken.
- The reserve design for Rocky is a reflection of Government policy and no more can be done with Russell because of its location in a mining lease area.

Buffers around patches of old-growth forest not in formal reserves

Submission comments – Comments on buffers on old-growth forest patches were divergent. Some submissions supported the concept of buffers, but expressed the view that they should be larger. On the other hand many submissions argued that buffers were an unnecessary and inflexible means of protecting the values in old-growth forest patches and that the application of management prescriptions to prevent adjacent operations impacting on the old-growth forest patch was a more reasonable approach.

Conservation Commission response - The Conservation Commission has accepted that the protection of informal reserves of old-growth forest should and can be protected without the inclusion of buffers. Therefore buffers around old-growth forest patches have not be included in the proposed FMP and the area has been made available for timber harvesting. The proposed FMP provides for the preparation of Guidelines for the Management of Informal Reserves which will (see Appendix 3 in the proposed FMP) contain special provisions for old-growth informal reserves. The Conservation Commission has also committed to auditing compliance with these guidelines as one of its priorities (see Action 31.2). That is, monitoring and auditing of compliance with the guidelines will be a focus during plan implementation.

4.2 Identification and reservation of high conservation value forest

Submission comments – Many submissions commented that they considered the high conservation value (HCV) study (Ecoscape Australia 2002) and the Conservation Commission's response to it (Conservation Commission 2002c) inadequate because of the limited outcome with respect to increased reservation and because the study was based on existing data which they considered inadequate. A common theme was the need to reassess what is HCV forest based on additional ground survey work unconstrained by time and budgets. In particular, one submission suggested that the forest ecosystem 'Jarrah south' had been incorrectly mapped resulting in a more extensive distribution being recorded than actually existed with the result that representation targets are more easily met.

Conservation Commission response – The Conservation Commission acknowledges that the HCV forest study undertaken by Ecoscape resulted in them recommending limited additions to the formal reserve system to the Minister for the Environment. The Conservation Commission has included the following HCV areas in the formal reserve

system in the proposed FMP: Stockyard block, Dalgarup block and the southern part of Witchcliffe block.

These additions should be seen in the context of the areas nominated in the *Protecting our old-growth forests* policy.

The Conservation Commission acknowledges that the best way to progress the question of what is HCV forest is to collect new data and has included an action to undertake targeted biological surveys of the forest in the proposed FMP that will provide additional data for evaluating the adequacy of the formal reserve system in capturing high conservation value forest. It should be noted that the Conservation Commission has modified that action from the comprehensive biological survey referred to in the Draft FMP in recognition of the fact that given the high cost of such a survey it is unlikely to be allocated the resources because of higher priorities in other areas of the State. The revised approach is for smaller more cost effective biological surveys that are targeted to particular areas of the forest and to particular values where data gaps are most acute.

4.3 The inclusion of regrowth forest in formal conservation reserves.

Submission comments – Many submissions commented on the “locking up” of large areas of karri and jarrah regrowth in the reserve proposals when the Government's *Protecting our old-growth forests* policy was directed at protecting old-growth forest. This was seen as unnecessarily reducing the potential socio-economic benefits from timber production.

Conservation Commission response – The Government's *Protecting our old-growth forests* policy specified forest blocks that were to be added to the formal reserve system. Where the policy stipulated the whole of the block was to be added to the formal reserve system this was implemented even though the blocks contained regrowth jarrah or karri forest resulting from past logging operations. Nevertheless, reserve design criteria do allow for the exclusion of regrowth near the boundary of a proposed reserve where existing roads allow for a sensible boundary and that option will be taken wherever possible to reduce the impact of the new reserves on the timber supply.

4.4 Additional reservation sought in submissions

Jarrahdale town surrounds

Submission comment – The Shire of Serpentine Jarrahdale sought the establishment of a ten-kilometre radius zone around the town of Jarrahdale to be managed primarily for ecotourism, education and recreation. The submission requested the deferment of logging in that zone indefinitely, although it recognised that selective logging would be needed some time in the future.

Conservation Commission response – With cooperation between the Shire, the community, the Department and the Forest Products Commission normal forest management guidelines will be applied in a manner more in keeping with the objectives of the Shire within the ten-kilometre radius around Jarrahdale. The planning process will be implemented at an early stage in the life of the plan.

Arcadia, Helms, Mungilup, Palmer and Yabberup

Submission comments – There were many calls for the boundaries to be reviewed by an independent person to ensure compliance with the Government policy on HCV forest protection.

Conservation Commission response – All of these blocks were assessed in the ‘moratorium’ block study of 2001 (URS Australia 2001). Government reviewed the assessment results and decided in January 2002 that Arcadia, Helms, Mungilup, Palmer and Yabberup would not be added to the reserve system, but be retained as State forest and be available for timber supply. Salinity concerns are to be addressed through research trials and the use of adaptive management where required.

An Aboriginal travel route identified in Helms block is to be protected through measures other than reservation of the block.

The Government decision on these blocks was reflected in the draft plan and has been carried into the proposed plan.

Dalgarup and Barrabup

Submission comments – there was strong support for the reservation of Dalgarup and just as strong opposition to its reservation on the basis of the unscientific social attachment criteria used to justify the reservation recommendation in the Conservation Commission’s advice to the Minister for the Environment (Conservation Commission, 2002c) and the need for the timber in it to support a viable industry.

Conservation Commission response – The Conservation Commission has previously recommended to Government that the remainder of Dalgarup be added to the formal reserve system and after considering the timber potential of the area still believes that position should be maintained. Consequently the proposed FMP incorporates the remainder of Dalgarup as a proposed national park.

The key values in Barrabup are recreation around the pool and Aboriginal sites and these have been directly addressed rather than adding the block to the formal reserve system. The pool and Aboriginal cultural values are protected by reservation and additional survey work completed to identify other Aboriginal cultural values.

Wellington pines

Submission comment - The Shire of Dardanup requested a section of proposed national park along Ferguson Road be traded for a piece of State forest currently planted with pines so that the State forest could be reserved following clearfelling of the pines. The piece of State forest planted with pines is in the Central Area Precinct of the Wellington Mills Structure Plan where the proposed uses are deemed to be incompatible with an industrial pine plantation.

Conservation Commission response – The Minister for the Environment has appointed a committee of community representatives to advise her on the appropriate boundaries for the Wellington National Park. The proposal has been referred to that committee for consideration in providing their advice to the Minister.

Greater Kingston National Park

Submission comment – Opposition was expressed at the reduction in area of approximately 16,000 hectares between the notional boundary in the *Protecting our old-growth forests* policy and the indicative boundary of the Greater Kingston National Park as in the Draft FMP. Calls were made for an explanation and the reinstatement of the “lost” area.

Conservation Commission response – The *Protecting our old-growth forests* policy committed to reservation of 19,000 hectares incorporating Corbal, Dudijup, Dwalgan, Kingston, Mersea, Walcott, Warrup, and Winnejup forest blocks. These forest blocks in their entirety cover an area of 34,840 hectares, considerably in excess of the policy commitment and including the Department’s fauna research site in Kingston block. The Government considered the policy commitments and decided to use the area figure and exclude the Kingston study site and other areas from the proposed park.

The remapped area now covers almost 21,000 hectares and incorporates all or part of each of the blocks quoted in the policy as well as part of Balban block to create a contiguous boundary with the proposed Tone-Perup National Park.

Easter

Submission comment – All of Easter should be protected to make the area proposed by Labor’s forest policy a truly viable nature reserve.

Conservation Commission response – The major conservation value in the block is the Darling Scarp forest ecosystem which does not meet the criterion that 15% of the pre-European extent is to be in formal reserves. The occurrence in Easter block is to be protected by informal reservation obviating the need to reserve the whole block. In addition linkages to other formal reserves in the area are established.

Warren 6

Submission comment – Warren 6 has never been logged but is not regarded as old-growth forest by the Department because it is thought to be regrowth from a wildfire 125 years ago. It is true virgin forest and should never be logged.

Conservation Commission response – The Government policy commitment is to protect old-growth forest that meets the accepted criteria. The status of old-growth forest in Warren 6 has been ground checked. This has resulted in an additional 18 hectares of old-growth forest being identified and protected through informal reservation.

Area bounded by the Gardner River, Riverway Road and Nelson locations 9863, 9866 and 9867.

Submission comment – The area was requested for reservation on the grounds that it is part old-growth forest and forms part of the visual amenity of the Bibbulmun track.

Conservation Commission response – The Minister for the Environment has previously considered a request for the addition of this area to the proposed Boorara-Gardner National Park. The Minister did not accede to the request on the basis that the indicative boundaries of the park have been mapped in line with the policy commitment and whereas boundaries prescribed in the policy have been amended to include adjacent areas of old-growth forest, in this case the area requested is not adjacent to the

boundary of the proposed national park. Nevertheless, the areas of old-growth forest and the visual amenity of the Bibbulmun track will be protected through the use of informal reserves.

Burnside, Mattaband and Wattle

Submission comments – The *Protecting our old-growth forests* policy stated that the proposed Walpole Wilderness Area would comprise “...and several thousand hectares of forest in Wattle, Mattaband and Burnside blocks”; however, this forest is still available for logging.

Conservation Commission response – The indicative boundary for the Walpole Wilderness Area in Wattle, Mattaband and Burnside was drawn up using criteria that sought to maximise the area of old-growth included in the park, but minimise the area of regrowth forest resulting from past cutting. The Minister for the Environment approved these criteria. On the roads available to define the boundary this meant that the total area of these blocks included in the Wilderness Area is 970 hectares rather than the “several thousand” quoted in the policy statement, which included regrowth forest.

The Walpole Wilderness Stakeholders Reference group has subsequently had an opportunity to consider the indicative boundaries and make recommendations on the proposed boundaries to the Minister for the Environment.

4.5 Ecologically sustainable forest management

Fauna (mature) habitat zones

Submission comments - The mature habitat zones, one significant component of Scenario A and hence determinant of timber yield, attracted considerable comment. There was support for the zones as a measure necessary for the maintenance of vertebrate fauna and the achievement of the biodiversity objectives. Conversely, there were many submissions objecting to the zones on the basis that:

- The proposed implementation was greater than that recommended in the report on which they were based.
- The scientific justification for them was weak.
- Although a good concept existing informal reserves already provided a similar function.
- Their impact on sustained yield was too great given the uncertainty in their effectiveness.
- They were unnecessary in karri.

Conservation Commission response – The Conservation Commission’s position with respect to fauna habitat zones was discussed earlier in this Explanatory Paper (section 3.2).

Fire management

Submission comments – The section on fire in the Draft FMP was widely criticised as being inadequate. Some submissions expressed concern at the impacts of burning on biodiversity but the majority of comments related to the inadequacy of the draft in addressing:

- The increasing build-up of fuel in the forests, the failure of past prescribed burning to control this build-up and the implications of this for the protection of life, property and biodiversity.
- The potential for the large increase in conservation reserves to exacerbate fuel build-up and consequently increase the fire suppression problem.
- The negative effect the reduction in the timber industry has had for the resources available for fire fighting.
- The financial and operational practicality of establishing and maintaining a mosaic of fuel ages for biodiversity purposes.

Conservation Commission response – The Conservation Commission acknowledges that the increasing build up of fuel in south-west forests is a concern to the community because of the increased risk that it poses to life and property values. However, the Conservation Commission believes that it is possible to find a better set of outcomes for both fuel reduction and the protection of biodiversity. In particular the Conservation Commission does not accept that the creation of additional national parks will necessarily further exacerbate the situation. The reserve system will be considered when planning broad strategic protection from wildfire for biodiversity conservation reasons integrated with burning for protection reasons.

While there are divergent views in the community on the appropriate balance between biodiversity maintenance and community protection, the issue will be further explored during the public EPA review of fire management.

The ability of the Department to achieve and maintain the level of protection seen as desirable in the south-west forests is affected by a range of factors including the level of resources available from external sources. The reduction in size of the native forest timber industry has already had and will continue to have a negative effect on resource availability for fire management. This is through a decrease in the traditional availability of heavy machinery and operators experienced in forest and fire situations and a decrease in the maintenance of access roads and associated infrastructure such as bridges and culverts that benefited fire management. As with the creation of formal reserves this does not necessarily mean fire management effectiveness will diminish because any resource problems can be overcome through a range of options such as contracting other private operators or having more machinery in-house. The key issue is that the Department identifies what is required to maintain biodiversity and achieve an adequate level of protection of community assets, the resources required to achieve the designated level and the mechanism to obtain those resources.

The actions in the proposed FMP to promote the maintenance of biological diversity by creating and maintaining diversity in understorey vegetation using fire is a new level of complexity in fire management and will not be achieved without additional resources. However, the actions reflect increased awareness of the role of fire in the maintenance of biodiversity and the desire to see that better implemented in field operations.

The Department has set in train a review of its fire management policy. A draft policy will be available for wide consultation, particularly during the Government's proposed review of fire management to be conducted by the EPA. The policy and consequent management actions will be finalised following Government consideration of the recommendations of the EPA review.

*Management of *Phytophthora cinnamomi* and dieback*

Submission comments – The major theme of comments on *Phytophthora* management were that the current management system, and its field implementation, was not precautionary enough. A number of submissions sought the cessation of the current policy based on protectable areas and many submissions sought greater monitoring of implementation and stricter penalties for non-compliance.

Conservation Commission response – The current management system was introduced as a result of Government acceptance of recommendations in the WA Dieback Review Panel report and the Conservation Commission does not have enough evidence to abandon that and revert to past management practices. However, the Conservation Commission recognises the seriousness of this issue and has proposed further action in the proposed FMP (see Actions 17.2 and 17.3).

Furthermore, the concerns expressed in the submissions are mirrored in the EPA's advice to the Minister for the Environment (Environmental Protection Authority 2001). This advice recognised the uncertainty in determining what are protectable areas and the likelihood that areas not deemed protectable would be infested, and a cautious approach was therefore recommended. The Minister for the Environment subsequently requested that an interagency liaison group review the EPA's advice and provide recommendations on implementation. This work has recently been completed.

Other advice to the Minister for the Environment from the EPA that remains relevant is to impose tighter restrictions on logging under wet soil conditions to lessen the risk of artificial spread of the pathogen. The proposed FMP limits the operation of heavy machinery under wet soil conditions. Although primarily designed to limit soil damage, these proposals will also have the effect sought in the EPA's recommendation.

The proposed FMP has introduced a new KPI (No.18) designed to monitor the effectiveness of dieback hygiene.

Dieback is a serious threatening process across much of the south-west of the State, well beyond the area covered by the proposed FMP. Other actions to address the issue more broadly are under development by agencies including the Dieback Consultative Council, the Department, the Environmental Protection Authority, and the Conservation Commission. For example, under its audit function the Conservation Commission is developing a strategic approach to measuring performance in relation to major conservation issues throughout the State such dieback.

Soil management

Submission comments – Views were expressed that logging and hauling should not take place during wet weather through to avoiding harvesting when the soil is wet does not take into account economic considerations.

Conservation Commission response – The Commission has sought to improve the level of protection afforded to soils by regulating activities involving the use of heavy machinery under conditions that risk unacceptable soil damage. That is by prohibiting defined activities under wet soil conditions, while permitting other activities that have a lower impact. For social and economic reasons the Conservation Commission has proposed a series of measures that allow some harvesting operations at the beginning

and end of the logging season so as to increase the number of days per year when in forest activities can occur.

4.6 Silviculture

Felling marri to waste

Submission comments – Many submissions objected to felling marri (and other species) when the log could not be commercially utilised. The reasons were a mixture of concern over waste and the loss of wildlife habitat. One submission, however, noted a reduction in the proportion of jarrah in stands as a result of the preferential harvesting of that species and advocated increased felling of marri to restore the balance.

Conservation Commission response – Jarrah and karri both require reduced competition in order for seedlings to establish and develop into future crop trees. Current silviculture achieves this by creating gaps in jarrah forest and clearfelling in mature karri forest. Where marri is intermixed with these species in order to establish or release regeneration the density of marri must be reduced otherwise it will dominate the site and prevent the jarrah and karri from re-establishing. Where marri is being considered for removal to facilitate jarrah and karri regeneration, and cannot be sold, there are three options available; the marri can be left and sub-optimal karri or jarrah regeneration accepted; the marri can be culled (felled to waste or killed standing) to provide for complete regeneration; or selective culling can be undertaken.

Culling is undesirable because it wastes a potential timber resource, reduces habitat options and is expensive. However, to not adequately regenerate large areas of the forest following a harvest that requires regeneration does not in the Conservation Commission's view, meet the principles of ESFM because timber productivity is impaired and species mix altered. The Conservation Commission has sought a compromise through the development of marri retention requirements within the jarrah and karri silviculture guidelines. The requirements use basal area limits of retained marri to limit culling where excessive waste and habitat loss would result. Details are in Appendix 5 of the proposed FMP.

Harvesting and regeneration in eastern jarrah forest.

Submission comments – The eastern jarrah forest was seen in some submissions as less able to recover from disturbance because of the drier conditions. A number of submissions called for a cessation of harvesting in the eastern part of the forest.

Conservation Commission response – This has been a long-standing concern and was reflected in Ministerial Condition 11 on the Forest Management Plan 1994-2003. This condition required the plan to be implemented as a trial and that monitoring of significant environmental elements, subsequently identified to include regeneration from shelterwood operations, be undertaken.

The current revision of the jarrah silviculture guideline recognises past problems in regeneration and the retained basal area in shelterwood treatments has been reduced from 15 square metres per hectare, to 8 to 10 square metres per hectare to reduce competition from the retained overstorey and allow more seedlings to establish successfully. In addition, the amendments propose a lower stocking level of regeneration, a uniform retention of retained tree cover, maximum use of existing

regeneration through coppice treatments, and a longer period of recruitment of seedlings through multiple regeneration events.

The EPA (1998) has reported on the Department's compliance with Ministerial Conditions, including Condition 11, and as a consequence of the Department's response to it (CLM 1998) the Codd report process was instigated to resolve the disagreement (Codd 1999). The parties agreed that an expert panel would report to the Conservation Commission and the Department in two stages on among other things, regeneration adequacy and the proposed amendments to the silviculture guidelines.

The two reports from the Ministerial Condition 11 expert panel are available on the Department's (Burrows *et al.* 2001) and the Conservation Commission's (Burrows *et al.* 2002) web sites.

Four of the recommendations from these reports relate to the adequacy of regeneration in the eastern forest. In particular, two recommendations sought documentation and analysis of existing regeneration survey information. The existing regeneration survey information was not collected in a format that allows trends over time to be identified. A new ground survey of areas treated for regeneration is being undertaken to determine:

- If new regeneration is establishing in areas cut to shelterwood.
- If stocking is meeting the revised silviculture guideline objective.
- The effects of timber harvesting, overstorey competition, fire intensity and soil disturbance and the effects of vegetation type, rainfall and evaporation gradients on stocking of pre-existing regeneration and establishment of new regeneration.

The survey will be completed and analysed by early 2004.

Gap creation in jarrah and clearfelling in karri

Submission comments – Opposition to gap creation in jarrah and clearfelling in karri was a strong theme of many submissions, including the widely used pro-formas. The practice was considered at odds with ESFM because of its impact on fauna and the structure of the forest.

Conservation Commission response – The creation of a gap in the jarrah canopy is necessary to provide the space for regeneration to develop. However, because jarrah is a smaller tree the size of the gap can be smaller than for karri. The size of gap used is a compromise between the minimum necessary to ensure regeneration development, the impact on wildlife and aesthetic values and operational and economic efficiencies. The maximum size of a gap under the previous FMP was 10 hectares and that has been retained for the proposed FMP. The jarrah silviculture guideline prescribes varying gap sizes between 0.2 hectares and the maximum 10 hectares depending on circumstances. The average gap size in recent years has been around five hectares with the maximum mainly utilised in the extensive areas of two-tiered forest in the Warren region. The average gap size will fall in future because logging of old-growth forest, where the larger gaps were used, no longer takes place.

In mature karri forest, clearfelling is preferred because the size of the trees makes selection systems unduly hazardous to the faller and areas that are too small are difficult and costly to regenerate and result in poor growth of regeneration due to the competition from surrounding trees. Therefore clearfelling has been retained in the karri silviculture

guideline. However, the size of the felled area can be varied considerably within the safety constraint. Large clearfelled areas are more efficient for economies in regeneration and felling operations, but have larger impacts on wildlife habitat and visual quality. A compromise has been sought by restricting the size of clearfelled areas. The maximum size of clearfell area set out in the proposed FMP is 40 hectares in two-tiered forest and 20 hectares in regrowth forest, but the average tends to be below the maximum, in the order of 10 to 15 hectares. In the future significant volumes of karri will come from regrowth thinning.

4.7 Determining the sustained yield of timber

Maps and data

Submission comments – The adequacy of the maps and data available to calculate the sustained yield was questioned, in some instances with specific examples of alleged mis-mapping of attributes such as old-growth forest. A common sentiment was that the data used in developing the Draft FMP was the same as the “discredited” data used in the Regional Forest Agreement process.

Conservation Commission response – In any field of natural resource management there is always room to improve the accuracy of maps and data. The critical question is whether any shortcomings are sufficiently significant to lead to unacceptable uncertainties in the calculation of sustained yield. To address this continuing concern the Conservation Commission appointed a consultant (Professor Ian Ferguson) to:

- Interview key stakeholders who have been critical of maps and data;
- Analyse the concerns raised and comment on the extent to which they may effect sustained yield calculations and whether adequate allowance has been made for them in calculations;
- Identify those that will be subject to detailed analysis within the terms of reference of the Independent Panel; and
- For others deemed to be significant make recommendations as to the most efficient way to review and correct them.

As most issues identified related to the validity of the calculation of sustained yield, the consultant referred them to the Independent Panel for their consideration when they reviewed the yield levels in the proposed FMP. The consultant’s report (Ferguson 2002) and the Conservation Commission’s response are available on the Conservation Commission’s website at www.conservation.wa.gov.au.

The Independent Panel considered the data issue in their review of sustained yield and concluded in their stage three report (Ferguson *et al.* 2003) that the geographic information system was excellent. They conducted spot checks of its capacity to accurately reflect the areas of various strata and were satisfied that it was very accurate. The Panel were also satisfied that well-developed protocols exist for checking and correcting identified errors in species and structural typing and appropriate allowances are made in calculating the sustained yield for the impact of these errors based on the historical experience of corrections. Overall the Panel reported satisfaction that the mapping and stratification systems are sufficiently accurate and robust for sustained yield calculations. Many of the recommendations made in earlier reports were found to have been implemented or were well advanced (Ferguson *et al.* 2001).

The Conservation Commission has responded to the issue of the comparison between strategic level predictions of the timber available within individual coupes and the actual level harvested by including a KPI (KPI 11) in the proposed FMP to identify and respond to any future trends.

Accounting for climate change

Submission comments – A number of submissions commented that the Draft FMP's treatment of climate change was inadequate. Specific concern was raised with respect to the impact the reduction in canopy cover resulting from logging might have on climate, the impact the current and forecast future drying trend would have on tree growth and hence sustained yield and the effect it might have on the establishment of regeneration. A common theme was the need to be precautionary, especially with the level of logging, in the face of forecast climate change.

Conservation Commission response – The Conservation Commission notes that the calculation of sustained yield is based upon conservative assumptions which have given rise to a buffer against uncertainties that arise due to forecast climate change.

The most recent research on climate variability and change in south-west Western Australia (Indian Ocean Climate Initiative 2001) suggests that the large scale clearing of the Wheatbelt is unlikely to be a contributor to the decline in rainfall experienced over the last 30 years, therefore the likelihood that the temporary change in evapotranspiration resulting from logging in south-west forests has played a part appears remote. They conclude that the decline in rainfall on the balance of probabilities has resulted from natural variation and the enhanced greenhouse effect.

It is apparent that some submissions considered that climate change has not been considered in determining the timber yield. The Conservation Commission acknowledges the potential for climate change to impact on the provision of all goods and services from forest ecosystems. The calculation of sustained yield has adopted a conservative approach by using growth data for the last 25 years that incorporates the current drying trend and assuming no growth on two-tiered jarrah and karri stands.

A drying trend may also affect seedling regeneration capability, particularly in the eastern jarrah forest. Therefore, the revised silviculture guidelines for jarrah increase the reliance on coppice and actively manage the coppice regeneration as a precautionary approach. This shift will require monitoring and review. The period of recruitment for shelterwood has been revised to schedule a nominal period of at least 25 years in the eastern forests before shelterwood removal is undertaken.

The impact of a prolonged drying trend on timber productivity is not considered to be a major problem in the medium-term because the major influence on tree growth rate is the number of trees competing for moisture and nutrients. Therefore, effects of reduced moisture availability for tree growth can be ameliorated to some extent by reducing the number of trees per hectare, as is done already with varying thinning regimes for drier sites. This provides a means of managing tree growth rates.

The overall approach recognises that in the face of major uncertainty associated with these events, rather than factor in particular allowances for all aspects, the preferred strategy is to develop and maintain systems for ongoing tracking and periodic

adjustment based on direct feedback. One of the factors that will be considered in the planned review of the sampling frame for permanent sample plots will be an improved capacity to monitor for climate-induced changes across the range of sites represented in the forests available for timber production.

The Independent Panel (Ferguson *et al.* 2003) concluded that the allowances made and the methods used to make the adjustments were reasonable.

Rotation lengths

Submission comments – There was one submission supporting the Draft FMP proposal to have shorter rotation lengths in part of the karri, but generally submissions commenting on rotation lengths sought extension of rotation lengths to 300 and 400 years to better achieve ESFM. A number of submissions inferred timber yields were based on rotation lengths between 50 and 100 years and commented that they should be longer.

Conservation Commission response – Rotation lengths used in the sustained timber yield calculations vary according to the forest strata but were a minimum of 175 years for regrowth jarrah forest and 100 years for regrowth karri forest. The rotation length for a small portion of the older karri regrowth (1,400 hectares) was shortened to provide additional sawlogs in the crucial period before available volumes increase significantly once the large areas of younger regrowth (i.e., areas clearfelled since the 1960s) reach sawlog size.

In the proposed FMP there is over 52 per cent of jarrah forest ecosystems and 66 per cent of karri forest ecosystems that are unavailable for timber harvesting. In light of this and other protection measures in the proposed FMP, the Conservation Commission believes the average rotation lengths of 175 years for jarrah and 100 years for karri and the areas of shorter rotations used to calculate sustained yields for the proposed FMP are justified to achieve a reasonable level of social and economic benefits from the harvesting of the areas available for timber production.

Unused prior allocation of jarrah and karri sawlogs

Submission comments – There was little support for the use of the unused prior allocations over a limited time period. Submissions either sought its cancellation because it was not sustainable or, in the case of the furniture industry, because the perception that it was additional to the sustained yield would make it difficult to market their products as being manufactured from timber coming from a sustainable harvest.

Conservation Commission response – In developing the timber yield for the proposed FMP the Conservation Commission has incorporated the unused prior allocations into the non-declining sustained yield; i.e., the unused prior allocations are no longer treated separately and made available in the short-term.

Species other than jarrah and karri

Submission comments – Some submissions criticised the Draft FMP for failing to calculate a sustained yield for marri, wandoo, blackbutt and other minor species such as sheoak.

Conservation Commission response – As jarrah and karri are the main commercially desirable species the focus of sustained yield calculations has been on these species. There is insufficient inventory information available to calculate a sustained yield for wandoo and blackbutt, and in any case the quantities available for harvest are very small because of the limited extent of forest types containing them and because those forest types are now predominantly in the formal or informal reserve system. Wandoo and blackbutt will be harvested incidentally where they occur in jarrah or karri forest and the proposed FMP has set a maximum limit on their average annual harvest.

The level of harvest of marri will also be as a consequence of the harvest of jarrah and karri sawlogs, however, the volumes available will be considerably larger than for wandoo or blackbutt. The Independent Panel (Ferguson *et al.* 2001) have already advised the Conservation Commission that the calculation of sustained yield for marri sawlogs is not warranted based on the high level of uncertainty in the conversion of marri bole volume to sawlog volume, nevertheless the maximisation of the recovery of marri sawlogs from felled trees remains an objective. The Conservation Commission and the Independent Panel reviewed the data on marri availability and growth, and were satisfied that there is no problem in sustaining current demand for sawlogs and other logs.

4.8 Craftwood and salvage logs

Submission comments – The failure of the Draft FMP to address the issue of access to craftwood and salvage logs was heavily criticised. Although the Draft FMP did not propose stricter requirements than currently exist, the large increase in reserves and consequent reduction in general logging highlighted the likely future problems of access to this material. Some submissions commented that the craftwood and salvage industry were of a greater social benefit than normal sawmill operations because they employed more people for the volume of wood processed and produced more value per cubic metre processed.

Conservation Commission response – The Forest Products Commission and the Department have been working on a review of the current system for access to craftwood to implement the commitment in the *Protecting our old-growth forests* policy to “create a craftwood licencing system for local craftspeople and artisans”. The proposed FMP incorporates an action to ensure that the new licensing system is brought to conclusion.

4.9 Utilisation and pricing of logs

Submission comments – The low price of native forest logs, the small proportion that first and second grade logs make up of the total cut and the loss in sawing were a common theme of submissions. Many submissions sought large increases (doubling to ten fold) in log prices, especially as a means to encourage better utilisation of felled trees and recovery in the sawmill. Much concern was expressed in submissions with regard to “waste” left in the bush and a strong desire to see it reduced through a variety of mechanisms including the immediate introduction of bole sawlogs. Some submissions wanted legally binding utilisation and recovery standards built into contracts.

A general theme of submissions on utilisation was that native forest timber should not be used for low value uses. In particular, its use in trusses and roofing material was opposed, as was the use of non-sawlog material for woodchips, firewood and bioenergy.

Conservation Commission response – The timber industry has been subject to significant restructuring in recent years with increased utilisation and recovery as one goal. As supply moves to smaller log sizes and potentially greater haulage distances economic pressures will continue. The Conservation Commission acknowledges these pressures on the industry.

Amendments to the CALM Act in 2000 removed the responsibility for the pricing of native forest logs from the Minister for the Environment, the Department and the Conservation Commission and passed it to the Minister for Agriculture, Forestry and Fisheries, and the Forest Products Commission. Because of this the proposed FMP cannot address pricing as a mechanism to deliver desired management outcomes. However, as the Forest Products Act requires that timber prices be set to recover the full cost of management, the Conservation Commission expects that management initiatives in the proposed FMP designed to protect biodiversity in timber harvesting operations will be fully funded.

As already noted, the Conservation Commission has a responsibility to advise the Minister for the Environment on the application of the principles of ESFM. One of the principles of ESFM is that improved valuation, pricing and incentive mechanisms should be promoted. The Conservation Commission will provide advice regarding this principle in the future.

For the present, the Conservation Commission believes that utilisation can be improved and has included an action in the proposed FMP to continue this process (see Action 14.2).

The utilisation of trees felled to produce first and second grade sawlogs and the utilisation efficiency of their conversion to sawn product is, as for log pricing, the responsibility of the Forest Products Commission. However, the Conservation Commission does have an interest in the utilisation of the trees felled under the plan as compliance with the sustained yield harvest is not only dependent on the volume of logs removed but also on ensuring that all logs that meet the specifications and are available are removed and included in the total volume. The Conservation Commission has conducted and published an audit on this (Conservation Commission 2002d).

The figures on log volumes made available show that in addition to the first and second grade sawlogs that form the sustained yield there are large volumes of other grade sawlogs (short sawlogs, small sawlogs, third grade sawlogs) that have been little utilised in the past due to the economics of their use. These are the logs that are often left standing in the bush or stacked on landings when no buyer can be found. Many submissions sought a higher sustained yield, particularly for the expansion of the furniture industry, than the Conservation Commission could deliver within its interpretation of the principles of ESFM. The opportunity for the furniture industry to expand is now dependent on the development of ways to economically utilise the large quantity of sawlogs below first and second grade standard. The proposed FMP commits the Forest Products Commission to explore this opportunity by, for example, the introduction of bole sawlog contracts.

4.10 The social and economic study

Submission comments – The social and economic study was criticised from all sides of the debate for its limited scope, lateness, inadequate consultation and poor data.

Conservation Commission response – The Conservation Commission acknowledges that the initial study (Coakes Consulting 2002) was inadequate and sought to rectify the problems by commissioning follow-up work to address the need to expand on the stakeholder consultation, the need to obtain a clearer picture of the impact of proposed timber yields and the identification of additional impact management strategies.

The additional work was completed (Alison Day and Associates 2002) and passed to the Conservation Commission and Forest Products Commission in late November 2002. The report is supplemental information to the social and economic study completed by Coakes Consulting and the overview report prepared by the Social and Economic Impact Steering Committee (Conservation Commission and Forest Products Commission 2002).

The Conservation Commission used the three parts of the social and economic impact study along with social and economic comments provided in submissions to inform its decision-making when adopting the management settings that led to the sustained yield in the proposed FMP. As indicated in this Explanatory Paper, environmental management decisions have often been adjusted to mitigate their social and economic consequences. For example, buffers around patches of old-growth forest in informal reserves have been deleted, the separation of fauna habitat zones increased, and the details of the soil protection measures proposed adjusted to mitigate the social and economic consequences of the proposed FMP.

4.11 Enforceability

Submission comments – Many submissions, particularly pro-forma submissions, wanted the plan and its associated documents such as silviculture guidelines to be legally binding on Government and industry.

Conservation Commission response – The Conservation Commission's response appears in the next section.

5. Enforceability of the approved FMP

There is a great deal of interest in ensuring that the measures to ensure sustainability are legally binding on those responsible for implementing the approved FMP.

Section 19(1)(g) of the CLM Act gives the Conservation Commission the role of setting performance criteria and assessing and auditing the performance of the Department and the Forest Products Commission in carrying out and complying with management plans, including an approved FMP. Sections 33(1) and (3) of the CLM Act, read together, make it a function of the Department to manage land “where there is a management plan, in accordance with that plan”. Submissions have pointed out that these links between planning and implementation are relatively weak as a means of enforcing compliance with the FMP.

To be effective, an FMP needs to be targeted at a high level, and to give the Department and the Forest Products Commission some discretion in day-to-day on-ground implementation. In a changing environment, with finite resources, the uncertainties and long time-frames of forest management, and as new information comes to hand, the management agencies will need to have some flexibility within which to operate.

Nevertheless, the Conservation Commission has concluded that the wording of the CLM Act could be improved to strengthen the relationship between the content of a management plan and its subsequent implementation and to provide a stronger mechanism for ensuring compliance. Similar comments apply to the Forest Products Commission and its legislation.

One way to address this issue without requiring legislative amendments, would be to prepare plans that are much more prescriptive and therefore potentially enforceable. In some measure the proposed FMP has followed this option by distinguishing between aspirational objectives on the one hand and specific management actions on the other hand. However, the Conservation Commission does not recommend this approach as the only response to the question of enforceability, since it does not conform to best practice.

The Conservation Commission believes that there is merit in exploring the greater use of administrative instruments.

One such option would be to grant the Conservation Commission the power to issue a direction to either the Department or the Forest Products Commission to require the recipient to take certain action, or refrain from certain actions. This power should only be exercised where there is an immediate and significant threat of serious or irreversible environmental damage. The approval of the Minister could be required, or alternatively there could be a right for the recipient to appeal to the Minister.

Another administrative option would be to make use of the existing provision of section 19(10) of the CLM Act. Under this provision, if the Conservation Commission advises the Minister to take, or refrain from certain action and the Minister decides to not accept that advice, the Minister must table the Conservation Commission's advice in Parliament within 14 days of making the decision. The provision could be extended to cover advice, initiated by the Conservation Commission, where there is an immediate and significant threat of serious or irreversible environmental damage.

It may be that different mechanisms are required for the Department and the Forest Products Commission to reflect the different relationships between the Conservation Commission and those two bodies and their respective Ministers. The Conservation Commission recommends that there be further discussions involving interested parties to develop a preferred approach.

6. Conclusions and Recommendations

The proposed FMP represents the Conservation Commission's advice to the Minister for the Environment on how the State's forests within the plan area should be managed for the next ten years, consistent with the principles of ESFM. In doing so, it incorporates

those commitments in the Government's *Protecting our old-growth forests* policy that can be implemented through a forest management plan, including commitments for the cessation of logging in old-growth forests and additions to the formal reserve system.

The proposed FMP has been developed with comprehensive consultation with stakeholders and the wider public. The final outcome owes much to matters raised in submissions and public forums, as well as expert scientific research, advice and modeling and the Conservation Commission's own deliberations.

Most of the Conservation Commission's proposals are included in the proposed FMP, but two specific recommendations made in this Paper are listed below:

1. Parts of the community have lost faith in the way the State's forests are managed. If this community faith is to be restored, and the outcomes of the Government's *Protecting our old-growth forests* policy are to be delivered and seen to be delivered it is essential that extra resources are directed towards the management of the forest, and the new monitoring and reporting arrangements. The Conservation Commission **recommends in the strongest terms** that these additional resources be provided.
2. Legislative amendments are needed to strengthen provisions for enforcement of the approved FMP. It may be that different mechanisms are required for the Department and the Forest Products Commission to reflect the different relationships between the Conservation Commission and those two bodies and their respective Ministers. The Conservation Commission **recommends** that there be further discussions involving interested parties to develop a preferred approach.

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