Guidelines for Protection of the Values of Informal Reserves and Fauna Habitat Zones

Sustainable Forest Management Series

Department of Environment and Conservation
SFM Guideline No. 4
2009

Department of
Environment and Conservation
Our environment, our future

Approved on: 28 October 2009 (Noted)
Last updated: 7 July 2009
Custodian: Manager Forest Policy and Practices Branch
Approved by: Minister for Environment

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Warren River, fringing vegetation and karri forest (Chris Garnett / CALM).

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ABBREVIATIONS AND ACRONYMS

BRM	Basic Raw Materials
CALM	Department of Conservation and Land Management
CALM Act	*Conservation and Land Management Act 1984*
CAR	Comprehensive, Adequate and Representative ï as applied to the conservation reserve system
CP	Conservation park
DEC	Department of Environment and Conservation
DEZ	Diverse Ecotype Zone
DFA	Deferred Forest Assessment
DoW	Department of Water
ISO	International Organisation for Standardisation
EMS	Environmental Management System
EPA	Environmental Protection Authority
ESFM	Ecologically Sustainable Forest Management
FCA	Forest Conservation Area
FHZ	Fauna Habitat Zone
FMB	Forest Management Branch
FMIS	Forest Management Information System
FMP	Forest Management Plan (2004 -2013)
FP Act	*Forest Products Act 2000*
FPC	Forest Products Commission
IMB	Information Management Branch
JANIS	Joint Australian and New Zealand Environment and Conservation Council/ Ministerial Council on Forestry Fisheries and Aquaculture National Forest Policy Statement Implementation Sub-Committee
KPI	Key Performance Indicator
MMP	Mining and Management Programs
MMPLG	Mining and Management Program Liaison Group
MOG	Mining Operations Group
NP	National Park
NR	Nature Reserve
NRS	National Reserve System
PDWSA	Public Drinking Water Source Area
RFA	Regional Forest Agreement
RIWI Act	*Rights in Water and Irrigation Act 1914*
RPZ	Reservoir Protection Zone
SDI	Soil Dryness Index
SILREC	Silviculture Recording system
TR	Timber Reserve
UCL	Unallocated Crown Land
VLM	Visual Landscape Management
WRC	Water and Rivers Commission

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1 Background

1.1 Purpose and scope

The purpose of this guideline is to provide guidance on practices for Department of Environment and Conservation (DEC) and Forest Products Commission (FPC) staff regarding the management of informal reserves and fauna habitat zones (FHZ).

In relation to informal reserves, this guideline has been developed to provide a strategy to meet the objective of the Forest Management Plan 2004-2013 (FMP) ó of seeking to conserve biodiversity outside of formal reserves and forest conservation areasô and in particular to meet the requirements of proposed action 3.1.2 of the FMP:

3.1 The Department and the Forest Products Commission will conduct their operations within the informal reserves established by Appendix 3:

3.1.1 in a manner that has regard to the requirements set out in Appendix 3 where the operation occurs prior to the approval of the Guidelines referred to in the following paragraph; and

3.1.2 in accordance with the Guidelines for the Management of Informal Reserves which are to:

- *be prepared by the Department with public consultation;*
- *provide for the manner in which the requirements of Appendix 3 are to be met; and*
- *be submitted to the Conservation Commission for advice and approved by the Minister for the Environment by 31 December 2004, when they will take effect and supersede Appendix 3.*

In relation to fauna habitat zones, this guideline has been developed to assist in achievement of the objective of the FMP ó seeking to prevent any species moving to a higher category of threat or, in particular, declining to irretrievably low levels as a result of management actions:ô and in particular to meet the requirements of proposed action 7.2.2 of the FMP:

7.2 The Department may change the locations and areas of indicative fauna habitat zones in a manner that:

7.2.1 has regard to the criteria specified in Appendix 4, where the change occurs prior to the approval of the Guidelines referred to in the following paragraph; and

7.2.2 is in accordance with Guidelines for the Selection and Management of Fauna Habitat Zones, which are to be:

- *prepared by the Department with public consultation; and*
- *submitted to the Conservation Commission for advice and approved by the Minister for the Environment by 31 December 2004, when they will take effect and supersede Appendix 4.*

Whilst proposed action 7.2.2 above indicated that the Guidelines for FHZ would cover both their selection management it has been decided that it is more effective to cover the management of FHZ in this Guideline together with the management of informal reserves. This is because many of the management requirements are similar to informal reserves and the document will provide a

consolidated approach for management issues for management issues associated with areas in State forest to be excluded from disturbance operations.

This Guideline is applicable to the management of State forest and timber reserves as under the FMP these are the land categories on which informal reserves and FHZ are established. The part of this Guideline addressing old-growth forest will also assist the management of old-growth forest on DEC-managed land outside of State forest and timber reserves.

This Guideline is a controlled document. It applies to all activities unless there is an authority that overrides the provisions of the *Conservation and Land Management Act 1984* (CALM Act) or the FMP.

1.2 Context

The primary purpose of this document is to provide operational guidelines. For the field user to effectively resolve the complex series of interacting factors he or she is faced with, application of the Guideline needs to be supported with training, enhanced by field experience and tempered by informed judgement and the advice of senior staff.

1.3 Legislative and policy requirements

The FMP was prepared in accordance with the CALM Act for land vested in the Conservation Commission within the Swan, South West and Warren regions of the Department of Conservation and Land Management (CALM ï now DEC). The CALM Act and the *Forest Products Act 2000* (FP Act) require the Department and the FPC respectively to operate in accordance with an approved forest management plan. Once these Guidelines are approved, it a requirement of the FMP that DEC and the FPC will conduct their operations within the informal reserves in accordance with these Guidelines.

The ñRegional Forest Agreement for the South-West Forest Region of Western Australiaò (RFA), which was ratified on the 4 May 1999, prescribes the requirement to identify and manage comprehensive, adequate and representative informal reserves (CAR) specifically for conservation purposes. The definition for these reserves is provided in Attachment A.

1.4 Custodianship and management of the guideline

The custodian of this document is the Manager of the Forest Policy and Practices Branch of the Sustainable Forest Management Division of the Department of Environment and Conservation.

Where the types, definitions and management principles described in the FMP for informal reserves and FHZ that are stated in this document are reviewed and require revision they will be subject to proposed actions 3.1.2 and 7.2.2 of the FMP which require guidelines ćto be prepared by the Department with public consultation, submitted to the Conservation Commission for advice and approved by the Minister for the Environmentĉ. It is anticipated that this will occur on about a five yearly cycle. Other parts of this document, including the more procedural elements, will be subject to review and revision as required, with approval by the Director of Sustainable Forest Management so as to provide timely continuous improvement to better meet the overall objective of the FMP whilst also better meeting the biological diversity objective of the FMP.

1.5 How to use the guidelines

The Guidelines have been structured to address each of the informal reserve types and fauna habitat zones that have been specified in the FMP. It is intended that the reader refer to each chapter to locate the details for that type of informal reserves. Within each chapter the advice is subdivided into five main categories:

- Characteristics;
- Planning;
- Implementation;
- Monitoring; and
- Management of data.

2 Old-growth forest

2.1 Characteristics of old-growth forest

2.1.1 Definition

The basis for the mapping of old-growth forest is the definition adopted nationally through the National Forest Policy Statement (1992):

> ñForest that is ecologically mature and has been subjected to negligible unnatural disturbance such as logging, roading and clearing. The definition focuses on forest in which the upper stratum or overstorey is in the late mature to over-mature growth phases.ò

This definition was subsequently refined by the Joint Australian and New Zealand Environment and Conservation Council / Ministerial Council on Forestry, Fisheries and Aquaculture report (JANIS 1997) to be:

> ñOld-growth forest is ecologically mature forest where the effects of disturbance are now negligibleò.

The FMP defines old-growth forest as;

> ñEcologically mature forest where the effects of unnatural disturbance are now negligible. The definition focuses on forests in which the upper stratum or overstorey is in a late mature to senescent growth stage.ò

The working definition for classification as old-growth forest (Comprehensive Regional Assessment Volume 1) has been linked to the forest type and is:

(1) karri and karri / tingle forest ï uncut forest which is mature or senescent;

(2) jarrah and jarrah / tingle forest ï uncut forest or forest which is subject to minimal disturbance and which is not known to be affected by *Phytophthora cinnamomi*;

(3) jarrah woodland(with <20%overstorey) which is not known to be affected by *Phytophthora cinnamomi*, and;

(4) wandoo forest and woodland (with <20% overstorey) ï uncut forest or woodland.

As part of the RFA process, the level of previous disturbance was mapped across the south-west forest region. Areas considered to have undergone sufficient disturbance to be excluded as old-growth forest are where;

(1) there has been past clearing for agriculture;

(2) there has been logging in the karri forest including heavy cutting resulting in even-aged regeneration (pre-1940), group selection cutting (1940-1960), clearfelled areas resulting in even-aged regrowth (post ï 1970), and;

(3) there has been logging in the jarrah forest including intensively cut areas (pre-1940), and areas cut to gaps or group selection (post ï 1960);

(4) there has been logging in the jarrah forest between 1940 ï 1960 which as resulted in persistent regrowth in the canopy at the time of assessment;

(5) there are symptoms of *Phytophthora cinnamomi* infection;

(6) there has been clearing for mining; and

(7) there has been a significant impact from grazing.

2.1.2 Disease status

2.1.2.1 Infested by Phytophthora cinnamomi

Areas of jarrah forest known to be infested by the introduced pathogen *Phytophthora cinnamomi* which are considered to be more than negligibly disturbed, and are excluded from being classified as old-growth forest.

The areas excluded from being classified as old-growth forest were based on the existing maps of known infestations, which incorporated data held by DECôs Forest Management Branch (FMB) from extensive and intensive mapping of disease since the 1970ôs. Where there is contemporary mapping of disease occurrence, then this should be incorporated into the planning process.

2.1.2.2 Other

There may also be instances where the effects of other forest diseases or conditions have affected the forest structure sufficiently so that the patch is significantly disturbed. There were none of these situations used in the existing classification and mapping.

2.1.3 Dimensions

To be classified as old-growth forest the individual patch must be greater than or equal to 2.0 ha in size.

2.2 Planning in relation to old-growth forest

2.2.1 Introduction

Where disturbance operations are proposed it is necessary to ensure that the areas of mapped old-growth forest are located and defined. During the planning of any disturbance operation base plans of the target area will be produced as part of the pre-disturbance assessment. These plans are developed directly from the Departmentôs corporate database. The plans show those areas of forest identified as old-growth forest and other informal reserve types. This base plan provides the first level of identification of old-growth forest patches for field operations staff.

2.2.2 Field inspection

The proponent of a disturbance operation must ensure that areas adjacent to mapped old-growth forest are inspected to determine whether they meet the criteria for old-growth forest. This inspection will focus on the old-growth forest patches as depicted on the base plan, and areas adjacent will be inspected, where practicable, by applying a systematic grid survey spaced at approximately 100-metre intervals. During this inspection the proponents should look for the presence of stumps, old snig tracks or signs of disturbance, the presence of a regenerating cohort from earlier harvesting and for signs of a significant break in the canopy structure.

Findings from the preliminary survey are used to determine whether a more detailed ground survey is required. The proponent should maintain records of these inspections, and these decisions.

If the field inspections of the boundaries of the old-growth forest patch are found to be more extensive than the previously mapped extent, the survey is to be extended until the true boundaries are determined.

In some forest areas particularly in the southern forests the dense nature of the understorey makes it difficult for a complete survey for the presence of old-growth forest to occur during the planning stage. It is important that operational staff remain alert for opportunities to identify old-growth forest at all stages of the preparation of a proposed disturbance operation. For example in the case of road construction an opportune time for further inspection to occur is at the time of field verification of road alignments prior to roads being cleared and constructed. In forests with a heavy understorey, verification of proposed new road alignments is achieved through blade up scrub rolling of understorey (Schedule 1). This allows for improved access for inspection for old-growth forest before permanent disturbance such as road building activity takes place.

2.2.2.1 Opportunities for field identification of old-growth forest

Operational planning

During site planning staff should be alert to identify significant patches with old-growth characteristics and report these for further assessment. This phase is the most practical and efficient time to identify old-growth forest that may be affected by disturbance operations such as recreation sites, infrastructure development and fire. At this early stage the widest range of options exist to relocate or alter the plans to ameliorate the effects on old-growth forest values.

Dieback interpretation

Areas proposed for significant ground disturbance have a dieback interpretation completed at an early stage of the harvest planning process. The interpreters should be alert to identify significant patches with old-growth characteristics and report these for further assessment.

Lignotuber surveys

Lignotuber surveys may be carried out in the jarrah forest as part of the harvest planning process. This work is commissioned by the FPC as part of their silvicultural planning requirements. This field assessment provides an opportunity for old-growth characteristics to be integrated as part of the survey output. The officer completing the survey should be alert to identify significant patches with old-growth characteristics and report these for further assessment.

Road / trail selection

Staff selecting roads should be alert to identify significant patches with old-growth characteristics and report these for further assessment. Every attempt should be made to avoid the need for identification of old-growth forest this late in the planning process, because the proponent will have expended significant effort by this stage, and in some instances the alteration of the alignment to avoid any old-growth forest that is identified will require a duplication of planning work associated with the alignment.

Treemarking

Treemarkers should be alert to identify significant patches with old-growth characteristics and report these for further assessment. Although there is an opportunity to identify and protect old-growth forest areas at this phase of the operation, this may have major operational and financial impact on proponent. All of the costs of planning and preparation of the harvesting cell will have been spent at this stage and the late removal of ñavailableò areas will reduce cost effectiveness of the operation.

2.2.3 Application of buffers

The retention of buffers around old-growth forest is not required.

2.2.4 Management boundaries

Boundary tracks will generally not be required. However there will be instances where boundary tracks are necessary around old-growth forest, and small areas of forest which is available for disturbance operations, may be included inside the track with the old-growth forest. Disturbance operations will not intrude into the old-growth forest.

2.2.5 Responsibilities

It is the responsibility of the proponent of any disturbance operation to identify and protect old-growth forest during the disturbance operation, by undertaking the following:

- Field survey the area to confirm the existing boundary and / or extend the boundary outward from the defined location;
- Maintain records of the inspections;
- If necessary, complete and submit and ñInformal Reserve Amendmentò form;
- Demarcate the old-growth boundary in the field;
- Manage the operations outside the old-growth forest.

2.3 Implementation of disturbance activities in old-growth forest

There are a wide range of activities that are currently undertaken in State forest and timber reserves that have the potential to impact on the values of old-growth forest. The level of risk that these present and the management requirements and options associated with them vary considerably. The management issues associated with these activities are outlined below. Where a manager cannot resolve the issue by using these Guidelines, or where the manager is unsure of the consequences, then the proposal should be referred to a more senior relevant officer for consideration and approval.

2.3.1 Demarcation

Demarcation of old-growth forest in conjunction with any disturbance operation will be achieved by painting white crosses on trees, with the cross facing away from the old-growth forest. The demarcation may be on the boundary of the old-growth forest or on the management boundary for the old-growth forest which may include areas of non old-growth forest.

All informal reserves are to be identified and demarcation completed before the disturbance phase of the operation is allowed to commence.

2.3.2 Flora and fauna management activities

2.3.2.1 Apiary sites

Where apiary sites are currently located within old-growth forest then they may continue to be used, providing that the apiarist does not create new tracks, damage standing trees or clear additional understorey. Apiary sites that are located in old-growth forest will be periodically inspected to ensure that their continued use is not degrading the values of the old-growth forest. Existing apiary sites may be relocated out of old-growth at the discretion of the relevant Regional Manager of the Department.

In general the Department will not relocate current apiary sites, or create new apiary sites within old-growth forest. The FMP requires that proposals to locate an apiary site in an informal reserve will be assessed on a case-by-case basis and require the approval in writing of the relevant Regional Manager of the Department. The Regional Manager will need to be satisfied that the proposal will not significantly impact on the values for which the informal reserve was established.

2.3.2.2 Wildflower harvesting

Wildflower harvesting is not permitted in old-growth forest.

2.3.2.3 Seed collection

Seed collection is not permitted in old-growth forest.

2.3.2.4 Predator and feral animal control

Existing predator and feral animal control activities such as baiting and trapping may be continued in old-growth forest. The authority for approving the continuation of these activities is the Departmental District Manager or their delegated officer.

New predator and feral animal control activities which involves site disturbance such as construction of tracks or clearing of the understorey should not be located in old-growth forest.

2.3.2.5 Weed control

Existing weed control activities such as spraying or grubbing may be continued in old-growth forest. The authority for approving the continuation of these activities is the Departmental District Manager or their delegated officer.

Where tree weeds have established in old-growth forest, especially adjacent to plantations or exotic species plots, then these trees should be considered for removal in conjunction with the harvest of the plantation or plot. Where they can be felled and extracted without machine intrusion into the patch, then commercial removal may be approved by the Regional Manager. For wider reserves where the logs are not accessible without machine intrusion into the old-growth forest then the commercial removal of the trees should not be approved.

Remedial treatment for weed control not involving machine entry may be considered and approved by Regional Manager. Weed control activities that involve construction of tracks or clearing of the understorey in old-growth forest must be referred to Director, Sustainable Forest Management for approval.

2.3.3 Fire management activities

The objectives for prescribed burning will be set taking into account the purpose and values sought to be protected in the burn. The burn prescription for an area that includes an old-growth forest must identify the old-growth forest and any other informal reserve and any special requirements for these areas with respect to prescribed burning.

2.3.3.1 Community protection burning

The inclusion of old-growth forest in areas burnt by low intensity prescribed fire to meet community protection or biodiversity objectives is generally acceptable with no special precautions to be applied.

2.3.3.2 Biodiversity management burning

Biodiversity management burning using low intensity prescribed fire is generally acceptable with no special precautions to be applied.

Where biodiversity management burning with high intensity fire is proposed in old-growth forest this may result in significant death in the overstorey and commence regeneration. Burns of this type and intensity should be clearly defined within the prescribed fire plan and may be approved on a case-by ï case basis by the Director, Sustainable Forest Management.

2.3.3.3 Wildfire management

Suppression

In the event of wildfire, the Incident Management Team should ensure that the Situation Officer is aware of SFM requirements and check for protection of the values contained in the old-growth forest. The protection of old-growth forest must receive consideration however this must be taken in the context of broader environmental values and other values threatened by the fire. For example it is not sensible to protect old-growth forest from fire, if this would require track construction with greater long-term environmental consequences or lead to higher value losses elsewhere.

Fire-line construction

Disturbance of old-growth forest by fire-line construction during wildfire suppression activities is to be avoided where possible, and the identification of old-growth forest in wildfire suppression planning must take high priority.

Felling for burn security

The felling of burning trees for burn security reasons during fire suppression old-growth forest requires the approval of the Incident Controller. The approval should be recorded in the Incident Log.

Rehabilitation

Disturbance from fire-line construction and felling for burn security within old-growth forest will be rehabilitated in the post-fire recovery process. Rehabilitation of fire-lines will be aimed at ameliorating erosion and compaction, minimising future erosion, restoring understorey cover and preventing future damage to trees by completing tops disposal. The particular requirements will be site specific and will be detailed in a Rehabilitation Plan for the incident.

All trees that have intersected with the fire-line will be considered for log salvage however the log should only be salvaged if it can be removed without further damage to standing trees and without the machine needing to leave the fireline. Log extraction along the centreline of the log is permitted as it should not create a new corridor of disturbance within the old-growth forest.

The rehabilitation work associated with trees felled for burn suppression, will be the cutting and stacking of tops and debris within 20 metres of the edge, tops disposal around trees, the cutting of stumps close to the ground, and other works required for management of biodiversity and visual amelioration of the disturbance.

The use of harvesting machinery to assist with removal of the logs and stacking of tops is permitted. The use of a machine in the old-growth may be appropriate due to rapid recovery of understorey following the burn. The use of such machines should comply with appropriate hygiene management protocols. Care should be taken to minimise the amount of soil that is moved in this operation, as this will affect the regeneration of understorey following the fire. Any decision to allow harvesting machinery or earthmoving equipment to enter old-growth forest to rehabilitate disturbance during an incident must be approved by the Incident Controller and recorded in the Incident Log.

2.3.3.4 Silvicultural burning

The inclusion of old-growth forest in regeneration burns is to be avoided where practicable. Where this is not practical, due to burn security or the need for excessive disturbance to keep fire out of the old-growth forest, then burning of the area is acceptable. This should be clearly defined within the prescribed fire plan for approval by the relevant Department Regional Manager.

Under no circumstances should the old-growth forest be subjected to a high intensity regeneration burn, unless it is intended to be regenerated. Regeneration of senescent old-growth forest may be approved on a case-by ï case basis by the Director, Sustainable Forest Management.

2.3.3.5 Hazardous trees

It is important for DEC staff to manage public safety and burn security issues that are related to hazardous trees on public roads, facility developments and burn boundaries in the old-growth forest prior to burning. Consideration of these issues prior to burning will enable the implementation of techniques that will have the least impact on the values of old-growth forest. The options for managing these trees are outlined in Schedule 2 - ï ñManaging hazardous treesò.

2.3.3.6 Construction and maintenance of water points

The construction of new water points for fire suppression is not generally permitted in old-growth forest. However where river and stream zones are also classified as old-growth, and a new water point is required to meet the required turn-around time for fire appliances, then the construction of a new water point may be approved on a case-by ï case basis by the Director, Sustainable Forest Management.

The requirements for the maintenance of water point and its associated infrastructure will be as per Fire Operations Guideline 28- *"Water point construction and maintenance*ò or its replacement.

2.3.4 Timber harvesting activities

2.3.4.1 Timber harvesting

Timber harvesting is excluded from old-growth forest, and harvesting machinery is prohibited from crossing the boundaries except for:

- access to a harvest site along an established road;
- removal of trees resulting from the clearing for an authorised road construction or upgrading; and
- removal of individual trees for safety reasons along public access roads, around recreation sites or adjacent to work sites.

Where the location of informal reserves has been altered as a result of planning inspections, an ñInformal Reserve Amendmentò form should be approved and **a new harvest coupe base plan issued** before harvesting can commence in areas adjoining old-growth.

A tree within the old-growth forest that presents a safety hazard to workers in the adjacent timber harvesting area **must** not be felled. The hazard will be avoided by establishing an adequate buffer around the hazardous tree in the harvest area. The relevant District office will retain a record of the decision.

Trees within the harvesting area should not be felled if they will fall into the old-growth forest. In instances where the tree accidentally falls into old-growth forest, such trees may only be salvaged according to the requirements outlined in Schedule 3 ï ñSalvage of logs in association with informal reservesò.

Even when salvage is not permitted the faller is required to carry out manual cross cutting of crown material and manual tops disposal of crown material from the base of trees in the old-growth forest to a distance of 1m for material less than 75mm in diameter, and 5m for material greater than 75mm in diameter or piles of debris. The use of harvesting machinery to assist with tops disposal within the old-growth forest is not permitted.

2.3.4.2 Craftwood

The collection of craftwood from old-growth forest is not permitted.

2.3.4.3 Firewood

The collection of domestic or commercial firewood from old-growth forest is not permitted.

2.3.4.4 Salvage of logs

Where trees or logs do not affect management access then they may not be salvaged.

2.3.5 Recreation activities

2.3.5.1 Recreation sites

There are many existing recreation sites that are situated within or adjacent to old-growth forest. The ongoing use and maintenance of these facilities will generally be continued and work may be approved by the District Manager. Any maintenance activity that requires the removal of trees, an expansion of the area of influence or permanent change to the understorey composition or structure on existing sites, must be referred to the Director, Sustainable Forest Management for approval.

The siting of permanent infrastructure associated with new recreation site development may occasionally be proposed in or adjacent to old-growth forest. These proposals will not generally be permitted if they will affect the core of the patch, but may be acceptable on the boundary of the patch. The proposal should be located so that it does not put any area of old-growth forest at higher risk of infestation by *Phytophthora cinnamomi*, during either the construction stage, or through its ongoing use.

It is generally not acceptable that trees be felled as part of the construction of new facilities unless this is unavoidable. It is preferred that the new infrastructure be relocated at the planning stage to avoid the need to fall trees for subsequent safety reasons. Proposals for new recreation site disturbance in old growth forest will be assessed on a case-by-case basis, and require approval in writing from the Director, Sustainable Forest Management.

2.3.5.2 Tracks / trails

Schedule 4 ï ñManagement of Access in Informal Reserves and Other Protected Areas within State Forest and Timber Reservesò should be used as reference to determine the appropriate conditions for construction and maintenance work on tracks / trails in informal reserves.

The continued use of existing trails in old-growth forest will generally be permitted, and the District Manager may approve ongoing low level maintenance. Any maintenance activity which requires the removal of trees, an expansion of the area of influence or permanent change to the understorey composition or structure on existing sites, must be referred to the Director, Sustainable Forest Management for approval.

The construction of new permanent walk trails or boardwalks through old-growth forest will be considered using a risk-based approach, and require approval from the Director, Sustainable Forest Management. This risk-based approach should include assessment of the risk to trail users from trees off the alignment (profile falling for safety will not generally be approved), overhead hazards (since management of dead material in crowns may result in significant ñchangeô to old growth forest values), and risk from wildfire in long unburnt old-growth forest.

2.3.5.3 Interpretation

The installation of new permanent infrastructure associated with interpretation will not generally be permitted if it will affect the core of the patch, but may be acceptable on the boundary of the patch. Proposals for such disturbance will be assessed on a case-by-case basis, and in conjunction with the cumulative effect of the associated trails.

2.3.6 Access roads

In general, new road construction should not occur in old-growth forest. Schedule 4 ï ñManagement of Access in Informal Reserves and Other Protected Areas within State Forest and Timber Reservesò should be used as reference to determine the appropriate conditions.

2.3.6.1 Existing roads

Existing well-formed roads may continue to be used through old-growth forest. It is important that any maintenance work (maintenance grading, slashing of verges and maintenance of pipes, sumps and offshoot drains) is carried out in such a way that it protects the values of the old-growth forest. The proponent should ensure that maintenance crews, machine operators and other contractors are closely supervised.

The relevant District Manager may approve all road maintenance works on the existing alignment after the preparation of a detailed works prescription.

The decision to upgrade an existing track through old-growth forest should not be treated lightly, and it must be demonstrated to be more environmentally acceptable than other options. Where upgrading an existing track within old-growth forest is contemplated the circumstances require assessment on a case-by-case basis and approval from the relevant Departmental Regional Manager.

2.3.6.2 New roads

In general, new road construction is not permitted in old-growth forest. However, in some cases new roading is necessary and where road construction within an old-growth forest patch is contemplated the circumstances require assessment on a case-by-case basis and approval from the relevant Departmental Regional Manager.

Roads and trails are significant potential sources for the introduction of *Phytophthora* and the placement of new roading will impact long-term management of protectable areas. The placement of new roads up-slope from old-growth forest is to be avoided to minimise the risk of infestation and should be located so that it does not put any area of old-growth forest at higher risk of infestation by *Phytophthora cinnamomi*, during either the construction stage, or through its ongoing use.

Roads through old-growth forest will be constructed and maintained in a manner that minimises the environmental impact on the conservation and landscape values.

2.3.6.3 Disease implications

Where existing roads are up-slope from old-growth forest, opportunities for the closure and rehabilitation should be sought, to minimise the risk of infesting the old-growth forest.

2.3.6.4 Closure / rehabilitation

In all cases the decision regarding the continued use or closure of any road is the responsibility of DEC, and the decision to close the road should be made by a DEC authorized person before any action is taken in the field. Where existing roads are identified for closure, then the road will be closed and rehabilitated to the standard required by DEC.

Where roads or tracks are closed, it is important that the rehabilitation techniques are carefully considered, and that the type and extent of work does not increase the magnitude of the disturbance. Detailed prescriptions outlining the extent of machine activity and proposed earthworks are required for rehabilitation of roads within old-growth forest. The proponent will closely supervise these activities, and the completed works will be inspected and signed off by the District Manager to ensure that the prescribed standards are achieved.

2.3.7 Research and inventory

2.3.7.1 Research plots

Where research plots are currently located in areas of forest that has been classified as old-growth forest these plots may remain in use, and plot maintenance activity which does not require the removal of trees, an expansion of the area of influence or permanent change to the understorey composition may continue, following advice by the research scientist to the relevant District Manager.

New research plots that may impact the values of old-growth forest and are not related to the study of old-growth forest characteristics or values should be located outside old-growth forest.

2.3.7.2 Inventory plots

Where inventory plots are currently located in areas of forest that have been classified as old-growth forest these plots may remain in use, and plot maintenance activity which does not require the removal of trees, an expansion of the area of influence or permanent change to the understorey composition may continue, following advice by the Manager, Forest Management Branch to the relevant District Manager.

Where plot maintenance is likely to require removal of standing trees, or major and periodic changes to the understorey structure (such as slashing of the understorey) then this will require the review of the inventory purpose, and endorsement by the Manager, Forest Management Branch, and the relevant Regional Manager.

New inventory plots that may impact the values of old-growth forest should be located outside old-growth forest.

2.3.8 Public utilities

The siting of new permanent infrastructure associated with pubic utilities (such as powerlines, pipelines, roads or other easements) may occasionally be required in or adjacent to old-growth forest. The proximity of the proposed utility to the old-growth forest may be important especially in the case of powerlines, because of the need to profile fall trees in the adjoining forest for line security. Proposals for such disturbance will be assessed through an environmental impact assessment process under the Environmental Protection Act on a case-by-case basis, and will need to be approved by the Minister for the Environment.

The Department will make submissions in relation to proposals for the establishment of new infrastructure submitted to it for comments or advice which seek to reduce the impact of those proposals on old-growth forest.

2.3.9 Basic raw materials

The extraction of basic raw materials is not permitted in old-growth forest. Exploration for BRM is not permitted in old-growth forest and vehicles involved in extraction of basic raw material are not permitted to leave the road through the old-growth forest unless the approval of the relevant Regional Manager has been obtained.

The operation of existing pits will be at the discretion of the Regional Manager, and all activities will be confined to the access roads and established pit area. Existing extraction sites in old-growth forest should, where reasonable and practicable, be closed and rehabilitated.

2.3.10 Mining

For existing operations the arrangements for protection the values contained in informal reserves vary for each individual company, tenement and types of mine. Different arrangements often exist for the

extensive exploration phase than for the intensive and highly disturbing infrastructure construction, mining, transport or processing phase.

The siting of mining or infrastructure associated with mining may occasionally be proposed in or adjacent to old-growth forest. Proposals for such disturbance will be assessed through an environmental impact assessment process under the Environmental Protection Act on a case-by-case basis, and will need to be approved by the Minister for the Environment.

For new operations, the Department will make submissions in relation to mining and petroleum proposals submitted to it for comments or advice which seek to reduce the impact of those proposals on old-growth forest.

Schedule 5 outlines the process used by Alcoa Australia to manage proposed disturbances in CAR informal reserves within their tenement.

2.3.11 Public safety

A tree within the boundary of an old-growth forest may be felled if it presents a safety hazard to workers in the area (except for workers involved in timber harvesting), or to the public, according to the following requirements:

- The proponent should request approval to fell trees in old-growth forest because of safety concerns, by providing a description of the tree, a map, and a photograph of the tree;
- The proponent must demonstrate that they have considered non-destructive methods to make the tree safe, as part of the request to fell the tree;
- The relevant Departmental Regional Manager should authorise in writing the felling of a dangerous tree prior to the work commencing;
- The tree must be tree-marked by a forest officer of the Department; and
- The relevant District office will retain a record of the decision.

2.4 Monitoring

The Department will periodically monitor compliance with the requirements for management of old-growth forest, in accordance with the principles of the ñForest Monitoring Guidelineò. WIN / MLs will be used to monitor non-compliance with forest management requirement of the FMP or approved conditions for disturbance activities.

Wildfire rehabilitation activities in old-growth will be inspected by Departmental staff, and signed off by the District Manager to ensure that the prescribed standards are achieved.

2.4.1 Audit

Management Audit Branch will periodically audit compliance with the requirements for management of old-growth forest.

2.5 Management of old-growth forest data

Old-growth forest data was generated within the Forest Management Information System (FMIS) by the intersection of databases that identify forest species, previous harvesting history, dieback status (jarrah), and development stage (karri).

The authority for amending old-growth forest data is dependent on a number of factors, as described below:

1. Areas not classified as old-growth forest in the Departmentôs corporate database at the commencement of the FMP.

    a. Areas classified as old-growth forest in the Departmentôs corporate database in 1997 but which were not classified as old-growth at the commencement of the FMP; and
    b. Areas on an indicative timber harvest plan where persons request the Conservation Commission to assess whether areas should be classified as old-growth forest.

        In these cases the Conservation Commission will advise the Department whether a change to old-growth forest data is warranted and the Department will amend the corporate data accordingly.

    c. Any other areas where as a result of updates to corporate databases that contribute to old-growth forest criteria.

        Where updates to corporate databases that contribute to old-growth forest criteria, such as disease status, are undertaken and mean that an area now meets the criteria for old-growth forest then areas can be classified as old-growth forest. In this case the Department has the authority to amend the corporate data.

2. Areas classified as old-growth forest in the Departmentôs corporate database at the commencement of the FMP.

    See Section 3.6 below.

2.5.1 Amending old-growth forest data

Once a new patch shape or location has been proposed then FMB use the following process to determine the validity of the nomination:

- Check the FMIS existing data themes (forest species, previous harvesting history, dieback status in jarrah forest, and development stages in karri forest);
- Check the current hygiene status;
- Complete a gridline assessment of stump location and verify forest typing;
- Plot the stump locations and any changes to mapped forest type;
- Assess the combination of factors against the criteria, and provide a recommendation of status.

2.5.1.1 Maps

Interim maps are generated using global positioning system (GPS) track files of the old-growth boundary using hand held GPS by FMB staff.

Final maps are generated using post-harvest photography. The location of the old-growth forest is digitised from the photographs and GPS track files, and imported into both FMIS and SILREC databases.

Where a change to the location or status of old-growth forest has been identified then FMB **must issue an amended operational base plan** before operational planning can be finalised and the operational approval granted.

2.5.2 Records

The following records will be retained;

- Initial recommendation;
- ñInformal Reserve Amendmentò form;
- Amended harvest coupe base plans or other operational base plan;
- Desktop summary of existing data;
- Field assessments; and
- Conservation Commission decision.

Records of source data (e.g. harvest history) in FMIS are subsequently amended so that old-growth status will result from future theme generation in FMIS.

The old-growth theme is generated from FMIS data. There is a gradual conversion of this information from raster (pixillated) format to a linear which will better reflect the location and shape of the patch in the field. This conversion occurs in an ongoing basis as disturbance activities occur adjacent to the mapped occurrence of old-growth.

Contributing datasets will continue to be refined and routinely updated on an annual basis with the subsequent generation of an old-growth forest dataset.

2.5.3 Custodianship

The custodianship of the FMIS, SILREC and associated databases assigned to the Manager, FMB.

3 Areas previously classified as old-growth forest

3.1 Characteristics of areas previously classified as old-growth forest

3.1.1 Definition

The FMP defines areas previously classified as old-growth forest as:

"Areas in the corporate database classified as old-growth forest on the commencement of the plan that are subsequently determined not to be old-growth forest or any other type of informal reserve (see Actions 3.2 and 3.3)."

The purpose being "to protect and retain these areas as informal reserves despite their reclassification from old-growth forest".

3.2 Planning

3.2.1 Introduction

The extent of old-growth forest is generated periodically by the desktop analysis of source datasets. Changes to old-growth classification may occur following update or refinement of source datasets. Areas previously classified as old-growth but which no longer have the characteristics of old-growth are identified.

On tenures available for timber production all informal reserves documented in Appendix 3 of the Forest Management Plan are intersected in a pre-determined hierarchy to create a composite layer. Areas previously classified as old-growth are the lowest in the hierarchical chain.

3.2.2 Source information

This dataset is derived from an intersection of the old-growth classifications at the commencement of the Forest Management Plan and the present.

3.3 Implementation of disturbance activities in areas previously classified as old-growth forest

These areas are to be managed as if they are old-growth as outlined in Section 2.3 (above).

3.3.1 Demarcation

Demarcation of the areas previously classified as old-growth forest in conjunction with timber harvesting operations will be as for other informal reserves in the *"Contractors' Timber Harvesting Manual"*. This requires white crosses to be painted on trees, with the cross facing away from the informal reserve. The demarcation will be around the management boundary for the previously classified as old-growth forest, and will include the patch and any buffer that has been included for management convenience.

All areas previously classified as old-growth are to be identified and demarcation completed before operations commence.

3.4 Monitoring

The Department will periodically monitor compliance with the requirements for management of areas previously classified as old-growth forest as a part of any monitoring in relation to old-growth forest.

3.4.1 Audit

Management Audit Branch may periodically audit compliance with the requirements for management of areas previously classified as old-growth forest as a part of any monitoring in relation to old-growth forest.

3.5 Management of areas previously classified as old-growth forest data

Where updates to corporate databases that contribute to old-growth forest criteria, such as disease status, are undertaken and mean that an area no longer meets the criteria for old-growth forest then areas can be declassified from being old-growth forest. However, areas identified in the corporate database at the commencement of the plan as old-growth forests that are subsequently assessed as non old-growth will remain excluded from timber harvesting and be reclassified as another type of informal reserve. Where no other type (e.g. stream zone) is appropriate, the area will be reclassified to the informal reserve type ñAreas previously classified as old-growth forestò.

In this case the Department has the authority to amend the corporate data.

3.5.1 Custodianship

The custodianship of the FMIS, SILREC and associated databases assigned to the Manager, FMB.

4 River and stream zones

4.1 Characteristics of river and stream zones

4.1.1 Definition

The FMP does not provide a definition of river and stream zones; however the Australian Standard All States (ATSAS) definition of a watercourse is ña natural channel or channels formed on a slope by surface fluvial erosion and depositionò. Additionally DEC incorporates areas where there is ñevidence of seasonal or perennial flow and / or the existence of riparian vegetationò.

The FMP does describe the purpose of river and stream zones as follows;

*"*Areas of forest including watercourses and riparian vegetation that has been set aside to;

- *Provide forest undisturbed by timber harvesting;*
- *Protect water quality;*
- *Protect aesthetic and social values; and*
- *Protect productive capacity, soil values and carbon pools."*

There is an additional subset that has been created by the RFA. Under this agreement all river or streams of a width equal to or greater than 150metres (4th order or higher) have been accredited under as a CAR informal reserve (RFA Agreement, Attachment 1, Clause 12(a), page 52).

4.1.2 Disease status

River and stream zones are identified on the basis of hydrological values and disease status is not used as a parameter in the selection of these reserves.

4.1.3 Dimensions

The FMP requirements for river and stream zone width are contained in Table 1.

Table 1 – River and stream zone widths

Stream Order	Total width (m)	Minimum Width (m)	Comment
1 - 3	60	At least 20 metres from the bank of the stream	
4	150	At least 50 metres from the bank of the stream	Accredited in RFA as CAR reserves.
5 +	400	At least 100 metres from the bank of the stream	Accredited in RFA as CAR reserves.

4.2 Planning in relation to river and stream zones

4.2.1 Introduction

During the planning stage of any disturbance operation base plans of the target area will be produced. These plans are developed directly from the Departmentôs corporate database, and show those areas of

forest zoned in the approved forest management plan as river and stream zones. This will provide the first level of identification of river and stream zones for field operations staff.

4.2.2 Field inspection

At the reconnaissance stage of planning, the proponent must inspect the target area to determine whether there are additional first order streams. Initially this inspection will focus on the river and stream zones as depicted on the base plan to determine whether there are:

(a) any areas which the proponent consider will meet the criteria for inclusion in the Departmentôs corporate database as a river and stream zone, but are not identified in that database; or

(b) any areas that are identified in the Departmentôs corporate database as river and stream zones that the proponent consider does not meet the criteria for inclusion in that database; and

(c) should maintain records of these inspections.

In some forest areas, particularly in the southern forests, the dense nature of the understorey makes it difficult for a complete survey for the presence of river and stream zones to occur during the planning stage. It is important that operational staff remain alert for the potential variation between mapped and actual stream location to occur, at all stages of the preparation of a proposed disturbance operation. In forests with a heavy understorey, blade up scrub rolling of understorey may be used to assist with stream location. This allows for an increased area to be accessible for inspection before more permanent disturbances takes place. The requirements for managing this work are outlined in Schedule 1 ï ñBlade-up Access on State Forest and Timber Reservesò.

In defining the stream zone only the prescribed width, according to its order, is required to be demarcated as river or stream zone. Where the forest both sides of the zone is dominated by a mature structure, and the width of the zone on one side of the stream is proposed to be less than the average width required, then the proponent must advise DEC as part of the operational plan, and the width must be adjusted on the other side and fixed as mandatory to ensure that the total width of mature forest is maintained.

In areas where there has been previous harvesting on the other side of the watercourse, the proponent should check the width of the retained buffer on both sides of the watercourse, and ensure that the total width of the river and stream zone is appropriate. Where the width of the undisturbed forest on the harvested side is less than the prescribed minimum or incorporates regrowth forest, then the minimum width on the unharvested side must be as indicated in Table 2.

Table 2 – Variations to river and stream zone widths

Stream Order	Width of mature forest on harvested side (m)	Minimum Width for current proposal (m)	Comment
1 - 3	Ò20	At least 30 metres from the bank of the stream	Not accredited as CAR reserve.
4	Ò50	At least 75 metres from the bank of the stream	Accredited in RFA as CAR reserves.
5 +	Ò100	At least 200 metres from the bank of the stream	Accredited in RFA as CAR reserves.

Where the prescribed zone width does not encompass all the non-forest riparian vegetation, the additional area must be excluded from the operation and be reclassified as another informal category (e.g. DEZ). Detail of the full extent of the category, including the component within the stream zone, is to be provided if it has not previously been mapped.

4.2.2.1 Opportunities

Operational planning

During site planning, staff should be alert to identify river and stream zones and report these for further assessment. This phase is the most practical and efficient time to identify river and stream zones that may be affected by disturbance operations such as recreation sites, infrastructure development and fire. At this early stage the widest range of options exist to relocate or alter the plans to ameliorate the effects on river and stream zone values.

Dieback interpretation

Areas proposed for significant ground disturbance have a dieback interpretation completed at an early stage of the harvest planning process. The interpreters should be alert to identify areas with river and stream zone characteristics and report these for further assessment.

Road / trail selection

Staff selecting roads or carrying out field verification of planned road alignments prior to roads being cleared and constructed should be alert to identify areas with river and stream zone characteristics and report these for further assessment. In forests with a heavy understorey, verification of proposed new road alignments is achieved through blade up scrub rolling of understorey. This allows for an increased area to be accessible for inspection before permanent disturbance takes place.

4.2.3 Application of buffers

There is no requirement to retain buffers to protect river and stream zones in the FMP.

4.2.4 Management boundaries

Boundary tracks will generally be required along river and stream zones in association with timber harvesting and the application of regeneration burning in the karri forest. Where boundary tracks are created for regeneration burning or other purposes then the tracks must have effective surface water management structures installed and maintained.

4.2.5 Responsibilities

It is the responsibility of the proponent of any operation to identify river and stream zones and protect them during their activities, by undertaking the following:

- Field survey the area to confirm the location of the river and stream zone;
- Maintain records of the inspections;
- If necessary, complete and submit and ñInformal Reserve Amendmentò form;
- Demarcate the river and stream zone in the field;
- Manage the operations outside the river and stream zone.

4.3 Implementation of disturbance activities in river and stream zones

There are a wide range of activities that are currently undertaken in river and stream zones and that have the potential to disturb the values that the river and stream zones exhibit. The level of risk that these present and the management requirements and options associated with them vary considerably. The management issues associated with these activities are outlined below. Where a manager cannot

resolve the issue by using these Guidelines, or where the manager is unsure of the consequences, then the proposal should be referred to a more senior officer for consideration and approval.

4.3.1 Demarcation

Demarcation of confirmed river and stream zones in conjunction with timber harvesting operations or other disturbance activities will be achieved by painting white crosses on trees, with the cross facing away from the river and stream zone. The demarcation may be on the boundary for the river and stream zone, or on the management boundary which may include areas outside the river and stream zones.

All river and stream zones are to be identified and demarcation completed before operations commence.

4.3.2 Flora and fauna management activities

4.3.2.1 Apiary sites

Where apiary sites are currently located within river and stream zones then they may continue to be used, providing that the apiarist does not create new tracks, damage standing trees or clear additional understorey. Apiary sites that are located in river and stream zones will be periodically inspected to ensure that their continued use is not degrading the values of the river and stream zone. Existing apiary sites may be relocated out of river and stream zones at the discretion of the relevant Regional Manager of the Department. The priority for relocating apiary sites will be given to those sites in CAR accredited river and stream zones, ahead of those stream zones which do not have CAR accreditation.

In general the Department will not relocate current apiary sites, or create new apiary sites within river and stream zones. The FMP requires that proposals to locate an apiary site in a river and stream zone be assessed on a case-by-case basis and require the approval in writing of the relevant Regional Manager of the Department. The Regional Manager will need to be satisfied that the proposal will not significantly impact on the values of the river and stream zone.

4.3.2.2 Wildflower harvesting

The harvesting of wildflowers is not permitted in 4th or higher order river and stream zones, as the RFA conditions identify that CAR informal reserves have been set aside specifically for conservation purposes.

In 1st, 2nd and 3rd order river and stream zones wildflower harvesting may be permitted. The Departmental District Manager may provide endorsement of the pickers licence for specific species and areas in which wildflower harvesting may occur. This endorsement will be for a limited number of wildflower species that occur naturally in stream zones or diverse ecotype zones. The Forest Management Plan (2004 ï 2013) Appendix 3 (page 91) indicates that the Department will prepare a list of such species and District Managers may endorse harvesting in stream zones for these species, where it is considered that harvesting would not significantly impact on the values of the stream zone.

Where approved, the activities of pickers in these areas will be monitored to ensure that picking does not lead to unnecessary disturbance of the values of the river and stream zone. Where there are signs of inappropriate harvesting technique, or excessive disturbance, the District Manager or their delegated officer will discuss the situation with the endorsed picker. If the inappropriate harvesting or disturbance continues then the District Manager will withdraw endorsement for the picker to harvest wildflowers in the river and stream zones for one or any of the species being picked.

4.3.2.3 Seed collection

Seed collection in 1st, 2nd and 3rd order river and stream zones may be endorsed by the Departmental District Manager or their delegated officer, as outlined above for wildflower harvesting.

4.3.2.4 Predator and feral animal control

Existing predator and feral animal control activities such as baiting and trapping may be continued in river and stream zones. The authority for approving the continuation of these activities is the Departmental District Manager or their delegated officer.

New predator and feral animal control activities which involve construction of tracks, traps or clearing of the understorey in river and stream zones must be referred to Regional Managers for approval, prior to the work commencing.

4.3.2.5 Weed control

Existing weed control activities such as spraying or grubbing may be continued in river and stream zones. The authority for approving the continuation of these activities is the Departmental District Manager or their delegated officer.

New remedial treatment for weed control not involving machine entry may be considered and approved by the District Manager. New weed control activities that involve construction of tracks or clearing of the understorey in river and stream zones must be referred to Regional Managers for approval.

Where tree weeds have established in river and stream zones, then these trees may be removed. When harvesting is proposed for an adjacent native forest coupe, plantation or exotic species plot, then the removal of the trees weeds should be considered in conjunction with the adjoining harvest. Where the tree weeds can be felled and extracted without machine intrusion into the river or stream zone, the non-commercial or commercial removal of the trees may be approved by the Regional Manager. For wider reserves, where the tree weeds are not accessible without machine intrusion into the river and stream zone, the non-commercial or commercial removal of the trees may be approved on a case-by-case basis by the Director, Sustainable Forest Management.

Eucalyptus muelleriana (Yellow stringy-bark) was inter-planted with karri in a number of coupes in the Warren Region during the 1980ôs, as a potential transmission pole resource. At the time different requirements were in place for the protection of river and stream zones. A more comprehensive network was subsequently introduced, culminating with the FMP requirements. As a result a number of areas that were previously inter-planted are now informal reserves. It is the Departmentôs intention that the E. *muelleriana* is progressively removed from the forest using a range of commercial and non-commercial options. In situations where a river or stream zone has been overlaid over a mixed *E. muelleriana* stand it is intended that the *E. muelleriana* be removed from the river or stream zone at the time of harvest of the adjoining stand. FMB and the relevant Regional Manager should ensure that any harvest approvals for these mixed *E. muelleriana* cells incorporates the requirement to remove the *E. muelleriana* from the adjoining river and stream zones, and that the harvesting is appropriately timed. Harvesting machinery may be required to enter the river and stream zones to harvest and process logs. This activity must be limited to the Low and Medium soil risk period, and be undertaken according to any other specific criteria required by the Director, Sustainable Forest Management.

4.3.3 Fire management activities

The objectives for prescribed burning will be set taking into account the purpose and values sought to be protected in the burn. The burn prescription for an area that includes a river and stream zone must identify the river and stream zone and any special requirements with respect to prescribed burning. The burn objectives must take account of those special requirements.

4.3.3.1 Community protection burning

The inclusion of river and stream zones in areas burnt by low intensity prescribed fire to meet community protection or biodiversity objectives is generally acceptable with no special precautions to be applied.

4.3.3.2 Biodiversity management burning

Biodiversity management burning using low intensity prescribed fire is generally acceptable with no special precautions to be applied. Where biodiversity management burning with high intensity fire is proposed this may be approved by the relevant Department Regional Manager providing it is clearly defined within the prescribed fire plan.

4.3.3.3 Wildfire management

Suppression

In the event of wildfire the Incident Management Teams should ensure that the Situation Officer is aware of SFM requirements and check for protection of the values contained in the river and stream zones. The protection of river and stream zones must receive consideration; however, this must be taken in the context of broader environmental values and other values threatened by the fire. For example, it is not sensible to protect river and stream zones from fire, if this would require track construction with greater long-term environmental consequences or lead to higher value losses elsewhere.

Fire-line construction

Disturbance of river and stream zones by fire-line construction during wildfire suppression activities is to be avoided where possible, and the identification of river and stream zones in wildfire suppression planning must take high priority.

Felling for burn security

The felling of burning trees for burn security reasons during fire suppression in a river and stream zone requires the approval of the Incident Controller. The approval should be recorded in the Incident Log.

Rehabilitation

Disturbance from fire-line construction and felling for burn security within river and stream zones will be rehabilitated in the post-fire recovery process. Rehabilitation of fire-lines will be aimed at ameliorating erosion and compaction, minimising future erosion, restoring understorey cover and preventing future damage to trees by completing tops disposal. The particular requirements will be site specific and will be detailed in a Rehabilitation Plan for the incident.

All trees that have intersected with the fire-line will be considered for log salvage however the log should only be salvaged if it can be removed without further damage to standing trees within the river and stream zone, and without the machine needing to leave the fireline. Log extraction along the centreline of the log is permitted as it should not create a new corridor of disturbance within the river and stream zone.

The rehabilitation work associated with trees felled for burn suppression, will be the cutting and stacking of tops and debris within 20 metres of the edge, tops disposal of trees and other works required for management of biodiversity and visual amelioration of the disturbance.

The use of harvesting machinery to assist with removal of the logs and stacking of tops on the edge of the river and stream zone may be appropriate due to rapid recovery of understorey following the burn. The use of such machines should comply with appropriate hygiene management protocols. Care

should be taken to minimise the amount of soil that is moved in this operation, as this will affect the regeneration of understorey following the fire. Any decision to allow harvesting machinery or earthmoving equipment to enter a river and stream zone to rehabilitate disturbance during an incident must be approved by the Incident Controller and recorded in the Incident Log.

4.3.3.4 Silvicultural burning

The inclusion of river and stream zones in low intensity silvicultural burns is acceptable. This should be outlined within the prescribed fire plan and approved by the relevant Department Regional Manager.

The inclusion of river and stream zones in regeneration burning is to be avoided where practicable. This requirement is targeted at increasing the short-term biodiversity benefits of retained vegetation undisturbed by harvesting. Where this is not practical, due to burn security or the need for excessive disturbance to keep fire out of the river and stream zones, then prescribed burning of the area is acceptable. Under no circumstances should the river and stream zones be subjected to a high intensity silvicultural burn without the written approval of the relevant Regional Manager.

4.3.3.5 Managing hazardous trees

It is important for DEC staff to manage public safety and burn security issues that are related to hazardous trees on public roads, facility developments and burn boundaries in the river and stream zones prior to burning. Consideration of these issues prior to burning will enable the implementation that will have the least impact on the river and stream zone values. The options for managing these trees are outlined in Schedule 2 - ñManaging hazardous treesò.

4.3.3.6 Construction and maintenance of water points

The construction and maintenance of water points for fire suppression is permitted. The requirements for the water point and its associated infrastructure will be as per Fire Operational Guideline No. 28- *"Water point construction and maintenance"* or its replacement Fire Operations Guideline.

4.3.4 Timber harvesting activities

4.3.4.1 Timber harvesting

Timber harvesting is excluded from river and stream zones and harvesting machinery is prohibited from crossing the boundaries except for:

- access to harvest along an established road;
- removal of trees resulting from the clearing for an authorised road construction or upgrading;
- removal of individual trees for safety reasons along public access roads, around recreation sites or adjacent to work sites; or
- removal of tree weed species as provided for in sub-section 4.3.2.5 (above).

Where the location of a river and stream zone has been added or altered as a result of planning inspections, an ñInformal Reserve Amendmentò form should be approved and **a new harvest coupe base plan issued** before harvesting can commence in areas adjoining river and stream zones.

A tree within the boundary of a river and stream zone that presents a safety hazard to workers in the adjacent timber harvesting area may be felled, providing it has been tree-marked by a forest officer of the Department before it is felled. The relevant District office will retain a record of the decision.

Trees within the harvesting area should not be felled if they will fall into the river and stream zone. In instances where the tree accidentally falls into a river and stream zone, such trees may only be

salvaged according to the requirements outlined in Schedule 3 ï ñSalvage of logs in association with informal reservesò.

Even when salvage is not permitted the faller is required to carry out manual cross cutting of crown material and manual tops disposal of crown material from the base of trees to a distance of 1m for material less than 75mm in diameter, and 5m for material greater than 75mm in diameter or piles of debris. The use of harvesting machinery to assist with tops disposal within the river and stream zone is not permitted.

4.3.4.2 Craftwood

The collection of craftwood from river and stream zones is not permitted.

4.3.4.3 Firewood

Collection of domestic or commercial firewood from river and stream zones is not permitted.

4.3.4.4. Salvage of logs

Conditions for the salvage of logs are outlined in Schedule 3 ï ñSalvage of logs in association with informal reservesò.

4.3.5 Recreation activities

4.3.5.1 Recreation sites

There are many existing recreation sites that are situated within or adjacent to river and stream zones. The ongoing use and maintenance of these facilities will generally be continued and work may be approved by the District Manager. Any maintenance activity that requires the removal of trees, an expansion of the area of influence or permanent change to the understorey composition or structure on existing sites, must be referred to the Director, Sustainable Forest Management for approval.

The siting of permanent infrastructure associated with new recreation site development may occasionally be proposed in river and stream zones. Proposals for such disturbance will be assessed on a case-by-case basis, and require approval in writing from the Director, Sustainable Forest Management.

4.3.5.2 Tracks / trails

Schedule 4 ï ñManagement of Access in Informal Reserves and Other Protected Areas within State Forest and Timber Reservesò should be used as reference to determine the appropriate conditions for construction and maintenance work on tracks / trails in informal reserves.

The continued use of existing trails in river and stream zones will generally be permitted, and the District Manager may approve ongoing low level maintenance. Any maintenance activity which requires the removal of trees, an expansion of the area of influence or permanent change to the understorey composition or structure on existing sites, must be referred to the Director, Sustainable Forest Management and require approval in writing.

The construction of new permanent walk trails or boardwalks through river and stream zones will be considered using a risk-based approach, and require approval from the Director, Sustainable Forest Management. This risk-based approach should include assessment of the risk to trail users from overhead hazards from trees, soil stability and erosion risk, and risk from wildfire.

If a new track or trail is proposed to cross a watercourse, within an area proclaimed under *Rights in Water and Irrigation (RIWI) Act 1914* as a ñSurface Water Areaò then an application to *"Interfere with Bed and Banks"* may be required from the Department of Water (DoW).

4.3.5.3 Interpretation

The installation of new permanent infrastructure associated with interpretation will not generally be supported. Proposals for such disturbance will be assessed on a case-by-case basis, and in conjunction with the cumulative effect of the associated trails.

4.3.6 Access roads

In general, new road construction should not occur in river and stream zones. However, in some cases new roading is necessary, for example where stream crossings are required in timber harvesting operations or when the upgrade of an existing track through a river and stream zone may be more environmentally acceptable than other options. Where road construction or upgrading within a river and stream zone is contemplated the circumstances require assessment on a case-by-case basis and written approval from the relevant Departmental Regional Manager. Schedule 4 ï ñManagement of Access in Informal Reserves and Other Protected Areas within State Forest and Timber Reservesò should be used as reference to determine the appropriate conditions.

4.3.6.1 Existing roads

Existing well-formed roads may continue to be used through river and stream zones. It is important that any maintenance works (maintenance grading, slashing of verges and maintenance of pipes, sumps and offshoot drains) is carried out in such a way that it protects the values of the river and stream zone. The proponent should ensure that maintenance crews, machine operators and other contractors are closely supervised when working in these sensitive areas.

The relevant District Manager may approve all road maintenance works on the existing alignment, after the preparation of a detailed works prescription.

The decision to upgrade an existing track through river and stream zone should not be treated lightly, and it must be demonstrated to be more environmentally acceptable than other options. Where upgrading an existing track within a river and stream zone is contemplated the circumstances require assessment on a case-by-case basis and approval from the relevant Departmental Regional Manager. In all instances the proponent will be responsible for maintaining and installing surface water management structures to control turbidity and erosion.

4.3.6.2 New roads

New road construction across a river and stream zone is permitted, and may be approved where the risks or consequences of this activity are considered to be more environmentally acceptable than other options to locate the road or provide access. In all instances the proponent will be responsible for installing and maintaining surface water management structures to control turbidity and erosion.

If a new road is proposed to cross a river and stream zone, within an area proclaimed under RIWI Act as a ñSurface Water Areaò then an application to *"Interfere with Bed and Banks"* may be required from the DoW.

Roads and trails are significant potential sources for the introduction of *Phytophthora* and the placement of new roading will impact long-term management of protectable areas. The placement of new roads up-slope from protectable forest in river and stream zones is to generally be avoided, particularly for roads to be used in all weather conditions. Where it cannot be avoided the road should be located to minimise **both** the area of protectable, dieback free forest put at risk, and the risk of infesting the river and stream zone.

Roads through river and stream zones will be constructed and maintained in a manner that minimises the environmental impact on the conservation and landscape values.

4.3.6.3 Disease implications

Where existing roads are up-slope from uninfested forest in river and stream zones, opportunities for the closure and rehabilitation should be sought, to minimise the risk of infesting the river and stream zone.

4.3.6.4 Closure / rehabilitation

In all cases the decision regarding the continued use or closure of any road is the responsibility of DEC, and the decision to close the road should be made by a DEC authorized person before any action is taken in the field. Where existing roads are identified for closure, then the road will be closed and rehabilitated to the standard required by DEC.

Where roads or tracks through river and stream zones are closed, it is important that the rehabilitation techniques are carefully considered, and that the type and extent of work does not increase the magnitude of the disturbance. Detailed prescriptions outlining the extent of machine activity and proposed earthworks are required. The proponent and Departmental staff will closely supervise these activities, and the completed works will be inspected and signed off by the District Manager to ensure that the prescribed standards are achieved.

4.3.7 Research and inventory

4.3.7.1 Research plots

Where research plots are currently located in river and stream zones, then plots based on low key monitoring, or observation, may remain in use. Plot maintenance activity which does not require the removal of trees, an expansion of the area of influence or permanent change to the understorey composition may continue, following advice by the research scientist to the relevant District Manager.

In some cases such as silvicultural research plots, there may be the expectation for a silvicultural treatment to be applied to the area that may include falling of trees, notching, or significant disturbance to the understorey structure or composition. These proposals are inconsistent with the management objectives for river and stream zones, and new research plots of this type should not be located in river and stream zones.

Where an existing plot of this nature forms part of a long-term project or there are limited options for alternative areas then these may be approved. This will require the review of the Research Management Plan, and endorsement by the Director DEC Science Division, and the relevant Regional Manager.

New research plots, other than stream hydrology or aquatic species research, should be located outside river and stream zones.

4.3.7.2 Inventory plots

Where inventory plots are currently located in river and stream zones, then plots based on low key monitoring, or observation, may remain in use. Plot maintenance activity which does not require the removal of trees, an expansion of the area of influence or permanent change to the understorey composition may continue, following advice by the Manager, Forest Management Branch to the relevant District Manager.

Where plot maintenance is likely to require removal of standing trees, or major and periodic changes to the understorey structure (such as slashing of the understorey) then this will require the review of the inventory purpose, and endorsement by the Manager, Forest Management Branch, and the relevant Regional Manager. New inventory plots of this nature should be located outside river and stream zones.

4.3.8 Public utilities

The siting of new permanent infrastructure associated with pubic utilities (such as powerlines, pipelines, roads or other easements) may occasionally be required in river and stream zones or adjacent to them. The proximity of the proposed utility to the zone may be important especially in the case of powerlines, because of the need to profile fall trees in the adjoining forest for line security. Proposals for such new disturbance will be assessed on a case-by-case basis, and will need to be approved by the Minister for the Environment.

If a new road associated with a public utility is proposed to cross a river and stream zone, within an area proclaimed under RIWI Act as a ñSurface Water Areaò then an application to *"Interfere with Bed and Banks"* may be required from the DoW.

The Department will make submissions in relation to proposals for the establishment of new infrastructure submitted to it for comments or advice which seek to reduce the impact of those proposals on river and stream zones.

4.3.9 Basic raw materials

The extraction of basic raw materials is not permitted in river and stream zones. Vehicles involved in extraction of basic raw material are not permitted to enter the river and stream zones unless the approval of the relevant Regional Manager has been obtained. Existing extraction sites in river and stream zones should, where reasonable and practicable, be closed and rehabilitated.

Pits proposed in a public drinking water source area (PDWSA) must leave a buffer strip between the pit and the stream as required in Table 3, and must be discussed with the DoW prior to the preparation of the final pit management plan.

Table 3 - Minimum distance to streams[1] below BRM pits

	Within PDWSA	Outside PDWSA[2]
Stream order	**Outside RPZ**	
1	20m	20m (total width 60m)
2	30m	20m (total width 60m)
3	30m	20m (total width 60m)
4	75m	50m (total width 150m)
5+	200m	100m (total width 400m)

1 Measured from the pit boundary.
2 Widths as specified in the Forest Management Plan (2004 -2013).

4.3.10 Mining

For existing operations the arrangements for protection the values contained in informal reserves vary for each individual company, tenement and types of mine. Different arrangements often exist for the extensive exploration phase than for the intensive and highly disturbing infrastructure construction, mining, transport or processing phase.

The siting of mining or permanent infrastructure associated with mining may occasionally be proposed in or adjacent to river and stream zones that are not intended to be mined. Proposals for such disturbance will be assessed on a case-by-case basis, and will need to be approved by the Minister for the Environment.

For new operations, the Department will make submissions in relation to mining and petroleum proposals submitted to it for comments or advice which seek to reduce the impact of those proposals on river and stream zones.

Schedule 5 outlines the process used by Alcoa Australia to manage proposed disturbances in CAR informal reserves within their tenement.

4.3.11 Public safety

Dangerous trees within the boundary of a river and stream zone may be felled if it presents a safety hazard to workers in the area, or to the public, according to the following requirements:

- The proponent should request approval to fell trees in a river and stream zone because of safety concerns, by providing a description of the tree, a map, and a photograph of the tree;
- The proponent must demonstrate that they have considered non-destructive methods to make the tree safe, as part of the request to fell the tree;
- The relevant Departmental Regional Manager should authorise in writing the felling of a dangerous tree prior to the work commencing;
- The tree must be tree-marked by a forest officer of the Department; and
- The relevant District office will retain a record of the decision.

4.4 Monitoring

The Department will periodically monitor compliance with the requirements for management of river and stream zones, in accordance with the principles of the ñForest Monitoring Guidelineò. WIN / MLs will be used to monitor non-compliance with forest management requirement of the FMP or approved conditions for disturbance activities.

4.4.1 Audit

Management Audit Branch will periodically audit compliance with the requirements for management of river and stream zones.

4.5 Management of river and stream zone data

The authority to amend the river stream zone data is reserved for the Manager FMB, and no major changes can be made without authorization. The ñInformal Reserve Amendmentò form provides the record of the recommendation. These original forms are held and processed at FMB (Bentley).

4.5.1 Amending river and stream zone data

Before amendments to the boundary of mapped rivers and streams can be made to corporate data the following process should be used;

- The proponent should inspect the mapped location in the field during operational planning;
- Where changes to river and stream zones, as depicted on base plans prepared from the Departmentôs corporate database, are identified an ñInformal Reserve Amendmentò form must be completed and submitted to the relevant Regional Manager.
- Regional staff will field check the variation and make a recommendation to Manager FMB for approval;
- Following approval the new location of the stream is to be corrected in the ñStream Bufferò database and FMIS database;

- Where the width of the zone on one side of the stream is less that the average width required, then the width must be adjusted on the other side and fixed as mandatory to ensure that the total width is achieved.
- Where changes to river and stream zones, as depicted on base plans prepared from the Departmentôs corporate database, are identified during harvest planning an ñInformal Reserve Amendmentò form must be completed and submitted to the relevant Regional Manager.
- A new harvest coupe base map is issued for use by the proponent;

4.51.1 Maps

Operational map products are developed incorporating the variation in location, but no specific river and stream zone map is produced.

4.5.1.2 Accuracy

Initial mapping is done from hand-held GPS track files, which are completed by FMB staff.

Final location and verification of the river zone is done by FMB, following the disturbance, from aerial photography.

Where a change to the location or status of a river and stream zone has been identified then FMB **must issue an amended operational base plan** before operational planning can be finalised and the operational approval granted.

4.5.2 Records

The following records will be retained by FMB;

- ñInformal Reserve Amendmentò form; and
- Amended harvest coupe base plans or other operational base plan.

Data records in the ñStream Bufferò database and FMIS are subsequently amended by FMB to reflect the approved changes following digitization of map information. These contributing datasets will continue to be refined and routinely updated on an annual basis. There will be periodic amendment to the data held by IMB to reflect major changes to the river and stream theme.

4.5.3 Custodianship

The custodianship of the FMIS and stream zone databases is assigned to the Manager, FMB.

5 Travel route zones

5.1 Characteristics of travel route zones

5.1.1 Definition

The FMP defines travel route zones as;

"The Level 1 and Level 2 travel routes in the corporate database as at December 2001 are shown in the table appearing in this appendix."

Travel routes in the Department's corporate database (December 2001) #

Level 1 travel routes (all or part of the following roads)	
Andrew Road	Mordalup Road
Bibbulmun Track	Muir Highway
Big Tree Road	Old Vasse Road
Boorara Road	Pemberton North Road
Cascades Track	Pemberton-Northcliffe Road
Channybearup Road	Pemberton-Northcliffe Tramway
Chindalup Trail	Perup Road
Collins Road	Pine Creek Road
Cormint Road/un-named track	Peppermint Grove Road
Coronation Road	Ritter Road
Cutting Road	River Road
Diamond Tree Road	Rainbow Trail
Davidson/Graphite Road	Sears Road
Deeside Coast Road	Seven Day Road
Dog Road	Smith Road
Donnelly Mill Road	South West Highway
Donnelly Drive (Panda, Gordon, Mobil Roads)	Spencer Road
Eastbourne Road	Stirling Road
Eastbrook Road	Tom Road
Glauders Road	Tramway Trail
Kuranda Road	Vasse Highway
Middlesex Road	Wheatley Coast Road
Mockerdillup Road	

Level 2 travel routes (all or part of the following roads)	
Allis Road	Pozzi Road
Corballup Road	Richardson Road
Grays Road	River Road
Hughes Road	Seaton Ross Road
Malimup Track	Scott Road
Moons Crossing Road	Thompson Road
Nornalup Road	West Palgarup Road
Orchid Road	

(# Taken from FMP ï ñAppendix 3 ï Informal Reservesò pages 92-93)

The purpose of the travel route zones is to protect aesthetic and social values within them.

5.1.2 Disease status

Travel route zones are specified in the FMP and disease status is not used as a parameter in the selection of these reserves.

5.1.2 Dimensions

5.1.2.1 Level 1 travel routes in Warren Region

The travel route zone comprises a corridor that extends at least 200 metres from each side of Level 1 travel routes in the Warren Region.

5.1.2.2 Level 2 travel routes in Warren Region

The travel route zone comprises a corridor that extends at least 100 metres from each side of Level 2 travel routes in the Warren Region.

5.1.2.3 Bibbulmun Track

The travel route zone comprises a corridor that extends at least 200 metres from each side of the Bibbulmun Track along the entire length of the Track.

5.2 Planning and identification of travel route zones

5.2.1 Introduction

No additional field checking of travel route zones is required.

The Bibbulmun Track travel route reserve (400 metres wide) has been accredited under the RFA as a CAR informal reserve (RFA Agreement, Attachment 1, Clause 12(e), page 52) and timber harvesting, including silvicultural thinning, is excluded from the reserve.

Portions of the Level 1 travel route zones have been accredited as CAR informal reserves, and timber harvesting, including silvicultural thinning, is excluded from the reserve. The areas accredited as CAR are displayed on the Departmental database.

In addition the RFA identified that 400 m wide travel route reserves in the area containing Karri Yellow Tingle ecosystem (RFA Agreement, Attachment 1, Clause 12(d), page 52) would also be accredited as CAR informal reserves, however these have now been absorbed into the formal reserve network via the Walpole Wilderness proposal.

5.2.2 Source information

The travel route zone corridors were established as a condition of the wood chip licence Agreement. They were reconfirmed as part of the formal review of the FMP.

The classification system for viewer sensitivity levels was as follows:

Level one - includes highways and other main roads (sealed or unsealed) with high (e.g. greater than 75 vehicles per day) levels of usage.

Level two - includes main roads with moderate levels of usage (sealed or unsealed).

5.2.3 Application of buffers

No additional buffers are required for travel route zones.

5.2.4 Responsibilities

It is the responsibility of the proponent of any operation to identify and demarcate the travel route zones shown on operational plans and protect them during their activities. Incompatible disturbance operations will not intrude into the travel route zone. There is no requirement for the proponent to field check for variations in the location of these zones.

5.3 Implementation of disturbance activities in travel route zones

There are a wide range of activities that are currently undertaken in travel route zones and that have the potential to disturb the values that the travel route zones exhibit. The level of risk that these present and the management requirements and options associated with them vary considerably. The management issues associated with these activities are outlined below. Where a manager cannot resolve the issue by using these Guidelines, or where the manager is unsure of the consequences, then the proposal should be referred to a more senior officer for consideration and approval.

5.3.1 Demarcation

Demarcation of travel route zones will be as described in the specifications, (as amended from time to time), in the ñ*Manual of Management Guidelines for Timber Harvesting in WA*ò. Specified distances are to be measured from the edge of the road formation for travel route zones.

All travel route zones are to be identified and demarcation completed before operations commence.

5.3.2 Flora and fauna management activities

5.3.2.1 Apiary sites

Where apiary sites are currently located within travel route zones then they may continue to be used, providing that the apiarist does not create new tracks, damage standing trees or clear additional understorey. Apiary sites that are located in travel route zones will be periodically inspected to ensure that their continued use is not degrading aesthetic or social values.

Existing apiary sites may be relocated out of travel route zones at the discretion of the relevant Regional Manager of the Department, and where this opportunity arises then the priority should be to move sites located in CAR accredited travel route zones first.

Apiary sites should not be created or relocated into CAR accredited travel route zones.

In general the Department will not relocate current apiary sites, or create new apiary sites within travel route zones. The FMP requires that proposals to locate an apiary site in a travel route zone will be assessed on a case-by-case basis and require the approval in writing of the relevant Regional Manager of the Department. Proponents will need to demonstrate that the proposal will not significantly impact on the values for which the travel route zone was established.

5.3.2.2 Wildflower harvesting

Wildflower harvesting should not be approved in travel route zones.

5.3.2.3 Seed collection

Seed collection should not be approved in travel route zones.

5.3.2.4 Predator or feral animal control

Existing predator and feral animal control activities such as baiting and trapping may be continued in travel route zones. The authority for approving the continuation of these activities is the Departmental District Manager or their delegated officer.

New predator and feral animal control activities which involve construction of tracks, traps or clearing of the understorey in travel route zones must be referred to Regional Managers for approval, prior to the work commencing.

5.3.2.5 Weed control

Existing weed control activities such as spraying or grubbing may be continued in travel route zones. The authority for approving the continuation of these activities is the Departmental District Manager or their delegated officer.

New remedial treatment for weed control not involving machine entry may be considered and approved by the District Manager. New weed control activities that involve construction of tracks or clearing of the understorey in river and stream zones must be referred to Regional Managers for approval.

Where tree weeds have established in travel route zones, especially adjacent to plantations or exotic species plots, then these trees should be considered for removal in conjunction with the commercial harvest of the plantation or plot, or in conjunction with approved silvicultural thinning of the regrowth forest in the travel route zone.

In CAR accredited travel route zones then commercial removal may be approved by the Regional Manager, where they can be felled and extracted without machine intrusion into the zone. For CAR reserves where the logs are not accessible without machine intrusion into the travel route zone then the commercial removal of the trees may be approved on a case-by-case basis by the Director, Sustainable Forest Management.

5.3.3 Fire management activities

The objectives for prescribed burning will be set taking into account the purpose and values sought to be protected in the burn. The burn prescription for an area must identify any travel route zone and any special requirements with respect to prescribed burning. The burn objectives must take account of those special requirements.

5.3.3.1 Community protection burning

The inclusion of travel route zones in areas burnt by low intensity prescribed fire to meet community protection or biodiversity objectives is generally acceptable with no special precautions to be applied.

5.3.3.2 Biodiversity management burning

Biodiversity management burning using low intensity prescribed fire is generally acceptable with no special precautions to be applied.

Where biodiversity management burning with high intensity fire is proposed this may be approved by the relevant Department Regional Manager providing it is clearly defined within the prescribed fire plan.

5.3.3.3 Wildfire management

Suppression

In the event of wildfire, the Incident Management Teams should ensure that the Situation Officer is aware of SFM requirements and check for protection of the values contained in the travel route zone.

The protection of travel route zones must receive consideration; however, this must be taken in the context of broader environmental values and other values threatened by the fire. For example it is not sensible to protect travel route zones from fire, if this would require track construction with greater long-term environmental consequences or lead to higher value losses elsewhere.

Fire-line construction

Disturbance of travel route zones during wildfire suppression activities is to be avoided where possible, and the identification of travel route zones in wildfire suppression planning must take high priority.

Felling for burn security

The felling of burning trees for burn security reasons during fire suppression in travel route zone requires the approval of the Incident Controller. The approval should be recorded in the Incident Log.

Rehabilitation

Disturbance from fire-line construction, felling for burn security within travel route zones will be rehabilitated in the post-fire recovery process. Rehabilitation of fire-lines will be aimed at ameliorating erosion and compaction, minimising future erosion, restoring understorey cover and preventing future damage to trees by completing tops disposal. The particular requirements will be site specific and will be detailed in a Rehabilitation Plan for the incident.

All trees that have intersected with the fire-line will be considered for log salvage however the log should only be salvaged if it can be removed without further damage to standing trees within the travel route zone, and without the machine needing to leave the fireline. Log extraction along the centreline of the log is permitted as it should not increase damage within the travel route zone or create a new corridor of disturbance.

The rehabilitation work associated with trees felled for burn suppression, will be the cutting and stacking of tops and debris within 20 metres of the edge, tops disposal of trees and other works required for management of biodiversity and visual amelioration of the damage.

The use of harvesting machinery to assist with removal of the logs and stacking of tops is permitted. The use of harvesting machinery may be appropriate due to rapid recovery of understorey following the burn. The use of such machines should comply with appropriate hygiene management protocols. Care should be taken to minimise the amount of soil that is moved in this operation, as this will affect the regeneration of understorey following the fire. Any decision to allow harvesting machinery or earthmoving equipment to enter a travel route zone to rehabilitate disturbance during an incident must be approved by the Incident Controller and recorded in the Incident Log.

5.3.3.4 Silvicultural burning

The inclusion of travel route zones in both jarrah and karri regeneration burning is to be avoided where practicable. This requirement is targeted at to increasing the short-term biodiversity benefits of retained vegetation undisturbed by harvesting. Where this is not practical, due to burn security or the need for excessive disturbance to keep fire out of the travel route zone, then prescribed burning of area is acceptable. This should be clearly defined within the prescribed fire plan for approval by the relevant Department Regional Manager.

Under no circumstances should the travel route zone be subjected to a high intensity silvicultural burn, without the written approval of the relevant Regional Manager.

5.3.3.5 Managing hazardous trees

It is important for DEC staff to manage public safety and burn security issues that are related to hazardous trees on public roads, facility developments and burn boundaries prior to burning. Consideration of these issues at the early stage will enable the implementation of non-destructive techniques to manage these trees. The options for managing these trees are outlined in Schedule 2 ï ñManaging hazardous treesò.

5.3.3.6 Construction and maintenance of water points

The construction and maintenance of water points for fire suppression is permitted. The requirements for the water point and its associated infrastructure will be as per Fire Operational Guideline No. 28- *"Water point construction and maintenance"* or its replacement Fire Operations Guideline.

5.3.4 Timber harvesting activities

5.3.4.1 Timber harvesting

The following timber harvesting or log salvage operations are permitted within travel route zones;

(ii) permitted thinning in travel route zones that:

- are not identified on the Departmentôs corporate database as being accredited in the RFA as contributing to the representativeness of the reserve system;
- contain regrowth forest; and
- in the opinion of the relevant Regional Manager of the Department, will occur in a manner that will enhance in the long term the visual quality of the landscape;

(iii) salvage from road clearing and salvage of individual trees removed for safety reasons;

Where the location of a travel route zone has been added or altered as a result of planning inspections, an ñInformal Reserve Amendmentò form should be approved and **a new harvest coupe base plan issued** before harvesting can commence in areas adjoining the travel route zone.

A tree within the boundary of a travel route zone that presents a safety hazard to workers in the adjacent timber harvesting area may be felled, providing it has been tree-marked by a forest officer of the Department before it is felled. The relevant District office will retain a record of the decision.

In instances where the tree accidentally falls into a travel route zone, such trees may only be salvaged according to the requirements outlined in Schedule 3 ï ñSalvage of logs in association with informal reservesò.

A faller is required to carry out remedial action even when salvage is not permitted when a tree is felled into the travel route zone. The faller is required to manually cross cut of crown material and manually tops dispose of crown material from the base of trees to a distance of 1m for material less than 75mm in diameter, and 5m for material greater than 75mm in diameter or piles of debris. The use of harvesting machinery to assist with tops disposal within the travel route zone is not permitted.

5.3.4.2 Craftwood

The collection of craftwood is not permitted from travel route zones.

5.3.4.3 Firewood

Collection of domestic or commercial firewood is not permitted from travel route zones.

5.3.4.4 Salvage of logs

Conditions for the salvage of logs are outlined in Schedule 3 ï ñSalvage of logs in association with informal reservesò.

5.3.5 Recreation activities

5.3.5.1 Recreation sites

There are many existing recreation sites that are situated within or adjacent to travel route zones. The ongoing use and maintenance of these facilities will generally be continued and work may be approved by the District Manager. Any maintenance activity that requires the removal of trees, an expansion of the area of influence or permanent change to the understorey composition or structure on existing sites, must be referred to the Director, Sustainable Forest Management for approval.

The siting of permanent infrastructure associated with new recreation site development may occasionally be proposed in travel route zones. These proposals may be acceptable on the boundary of the zone. Proposals for such disturbance will be assessed on a case-by-case basis, and require approval in writing from the Director, Sustainable Forest Management.

5.3.5.2 Tracks / trails

Schedule 4 ï ñManagement of Access in Informal Reserves and Other Protected Areas within State Forest and Timber Reservesò should be used as reference to determine the appropriate conditions for construction and maintenance work on tracks / trails in informal reserves.

The continued use of existing trails in travel route zones will generally be permitted, and the District Manager may approve ongoing low level maintenance. Any maintenance activity which requires the removal of trees, an expansion of the area of influence or permanent change to the understorey composition or structure on existing sites, must be referred to the Director, Sustainable Forest Management and require approval in writing.

The construction of new permanent walk trails or boardwalks through travel route zones will be considered using a risk-based approach, and require approval from the Director, Sustainable Forest Management.

5.3.5.3 Interpretation

The installation of new permanent infrastructure associated with interpretation may be acceptable on the boundary of the travel route zone. Proposals for such disturbance will be assessed on a case-by-case basis, and in conjunction with the cumulative effect of the associated trails.

5.3.6 Access roads

In general, new road construction is prohibited in travel route zones. However, in some cases new roading is necessary to provide access to a harvest coupe from a public road or when the upgrade of an existing track through a travel route zone may be more environmentally acceptable than other options. Where road construction or upgrading within a travel route zone is contemplated the circumstances require assessment on a case-by-case basis and written approval from the relevant Departmental Regional Manager. Schedule 4 ï ñManagement of Access in Informal Reserves and Other Protected Areas within State Forest and Timber Reservesò should be used as reference to determine the appropriate conditions.

5.3.6.1 Existing roads

Existing well-formed roads through travel route zones may continue to be used. It is important that any maintenance works (maintenance grading, slashing of verges and maintenance of pipes, sumps and offshoot drains) are carried out in such a way that they protect social and aesthetic values. The

proponent should ensure that maintenance crews, machine operators and other contractors are closely supervised when working in these sensitive areas.

DEC may realign access roads. Where this occurs on a road identified as having a travel route zone, the travel route zone will transfer to the new alignment. The relevant District Manager may approve all road maintenance works on the existing alignment, after the preparation of a detailed works prescription.

The decision to upgrade an existing track through a travel route zone should not be treated lightly, and it must be demonstrated to be more environmentally acceptable than other options.

5.3.6.2 New roads

In general, new road construction should not occur in travel route zones. However, in some cases new roading is necessary and where road construction within a travel route zone is contemplated the circumstances require assessment on a case-by-case basis and approval from the relevant Departmental Regional Manager.

Roads and trails are significant potential sources for the introduction of *Phytophthora* and the placement of new roading will impact long-term management of protectable areas. New roads up-slope from uninfested forest in travel route zones is to generally be avoided, particularly for roads to be used in all weather conditions, to minimise the risk of infesting the travel route zone.

Roads through travel route zones will be constructed and maintained in a manner that protects social and aesthetic values and minimises the environmental impact on the conservation and landscape values.

5.3.6.3 Disease implications

Where existing roads are located above uninfested forest in travel route zones opportunities for realignment or surfacing may be considered to assist the long-term management of protectable areas.

5.3.6.4 Closure / rehabilitation

In all cases the decision regarding the continued use or closure of any road is the responsibility of DEC, and the decision to close the road should be made by a DEC authorized person before any action is taken in the field. Where existing roads are identified for closure, then the road will be closed and rehabilitated to the standard required by DEC.

Where roads or tracks are closed, it is important that the rehabilitation techniques are carefully considered, and that the type and extent of work does not increase the magnitude of the disturbance. Detailed prescriptions outlining the extent of machine activity and proposed earthworks are required. The proponent and Departmental staff will closely supervise these activities, and the completed works will be inspected and signed off by the District Manager to ensure that the prescribed standards are achieved.

5.3.7 Research and inventory

5.3.7.1 Research plots

Where research plots are located in travel route zones, then plots based on low key monitoring, or observation, which will not result in the changes to the level of disturbance, may remain in use. Plot maintenance activity which does not require the removal of trees or permanent change to the understorey composition may continue, following advice by the research scientist to the relevant District Manager.

In some cases such as silvicultural research plots, there may be the expectation for a silvicultural treatment to be applied to the area that may include falling of trees, notching, or significant disturbance to the understorey structure or composition. All proposals, except silvicultural thinning of regrowth forest in non-CAR travel route zones, are inconsistent with the management objectives for travel route zones, and new research plots of this type should not be located in travel route zones.

Where an existing plot of this nature forms part of a long-term project or there are limited options for alternative areas then these may be approved. This will require the review of the Research Management Plan, and endorsement by the Manager DEC Science, and the relevant Regional Manager.

New research plots should not be located in CAR travel route zones, or the Bibbulmun track buffer zone.

5.3.7.2 Inventory plots

Where inventory plots are located in travel route zones, then plots based on low key monitoring, or observation, which will not result in the changes to the level of disturbance, may remain in use. Plot maintenance activity which does not require the removal of trees or permanent change to the understorey composition may continue, following advice by the Manager, Forest Management Branch to the relevant District Manager.

Existing plots where maintenance involves thinning of regrowth stands in non-CAR travel route zones may remain. Other plots where maintenance is likely to require removal of standing trees, or major and periodic changes to the understorey structure (such as slashing of the understorey), as is the case with regrowth plots, will require the review of their Inventory purpose, and endorsement by the Manager, Forest Management Branch, and the relevant Regional Manager. New inventory plots of this nature should not be located in CAR travel route zones, or the Bibbulmun track buffer zone.

5.3.8 Public utilities

5.3.8.1 General

The siting of new permanent infrastructure associated with pubic utilities (such as powerlines, pipelines, roads or other easements) may occasionally be required in travel route zones. The proximity of the proposed utility to the travel route zone may be important especially in the case of powerlines, because of the need to profile fall trees in the adjoining forest for line security. Proposals for such new disturbance will be assessed on a case-by-case basis, and will need to be approved by the Minister for the Environment.

5.3.9 Basic raw materials

Extraction of basic raw material is not permitted from travel route zones. Machinery involved in extraction of basic raw materials is prohibited from crossing travel route zone boundaries, unless the approval in writing of the relevant Regional Manager has been obtained.

Existing extraction sites in travel route zones should, where reasonable and practicable, be closed and rehabilitated.

5.3.10 Mining

For existing operations the arrangements for protection the values contained in informal reserves vary for each individual company, tenement and types of mine. Different arrangements often exist for the extensive exploration phase than for the intensive and highly disturbing infrastructure construction, mining, transport or processing phase.

The siting of mining or permanent infrastructure associated with mining may occasionally be proposed in or adjacent to travel route zones, particularly the Bibbulmun Track. Proposals for such disturbance will be assessed on a case-by-case basis, and will need to be approved by the Minister for the Environment.

For new operations, the Department will make submissions in relation to mining and petroleum proposals submitted to it for comments or advice which seek to reduce the impact of those proposals on travel route zones.

Schedule 5 outlines the process used by Alcoa Australia to manage proposed disturbances in CAR informal reserves within their tenement.

5.3.11 Public safety

Dangerous trees within the boundary of a travel route zone may be felled if it presents a safety hazard to workers in the area, or to the public, according to the following requirements:

- The proponent should request approval to fell trees in a travel route zone because of safety concerns, by providing a description of the tree, a map, and a photograph of the tree;
- The proponent must demonstrate that they have considered non-destructive methods to make the tree safe, as part of the request to fell the tree;
- The relevant Departmental Regional Manager should authorise in writing the felling of a dangerous tree prior to the work commencing;
- The tree must be tree-marked by a forest officer of the Department; and
- The relevant District office will retain a record of the decision.

5.4 Monitoring

The Department will periodically monitor compliance with the requirements for management of travel route zones, in accordance with the principles of the ñForest Monitoring Guidelineò. WIN / MLs will be used to monitor non-compliance with forest management requirement of the FMP or approved conditions for disturbance activities.

5.4.1 Audit

Management Audit Branch will periodically audit compliance with the requirements for management of travel route zones.

5.5 Management of travel route zone data

The authority to amend the travel route zone data is reserved for the Manager FMB, and no major changes can be made without authorization. The ñInformal Reserve Amendmentò form provides the record of the recommendation. These original forms are held and processed at FMB (Bentley).

The corridors that are currently assigned as travel route zones were established as part of the formal review of the FMP. Changes to the corridor assignment based on analysis of usage etc may occur as part of the next review and the travel route zones will be reassigned for the life of the new FMP.

5.5.1 Amending travel route zone data

Where the position of a road that has a travel route zone assigned to it is altered by upgrading or realignment by Main Roads Western Australia, the Local Government Authority or DEC then the

travel route zone will move to reflect the new location. The original travel route zone will no longer be recognised as a travel route zone, and will be available for harvest unless it is suitable for inclusion as another informal reserve type. These changes will occur whenever an inter-government land transfer occurs to allow the new road to be constructed, and will be treated as such, as soon as the transfer is agreed in principle between Department or with the LGA.

In the case of movement in the Bibbulmun Track alignment, a temporary re-alignment will not activate the establishment of a harvest exclusion zone along the new alignment. This will only occur with the approval of the Director, Sustainable Forest Management, once the new alignment has been established by negotiation with the Director, Parks and Visitor Services.

Where changes to the location or status of a travel route zone have been identified then FMB **must issue an amended operational base plan** before operational planning can be finalised and the operational approval granted.

5.5.2 Records

The following records will be retained by FMB;

- ñInformal Reserve Amendmentò form;
- Amended harvest coupe base plans or other operational base plan.

Data records in FMIS are subsequently amended by FMB to reflect the approved changes following digitization of map information. These contributing datasets will continue to be refined and routinely updated on an annual basis. There will be periodic amendment to the data held by IMB to reflect changes to the travel route zone theme.

5.5.3 Custodianship

Custodianship of the FMIS database is assigned to the Manager, FMB.

6 Diverse ecotype zones (DEZ)

6.1 Characteristics of diverse ecotype zones

6.1.1 Definition

The FMP defines diverse ecotype zones in the Glossary as;
"Areas of the forest, generally but not always with little tree cover, that are identified at the operational management scale to be protected from activities associated with timber harvesting because of their importance for the conservation of biodiversity. They include sedge and herb vegetation, rock outcrops, heath, wetlands, etc."

6.1.2 Structural Characteristics

The aerial photography interpretation (API) codes used to develop the DEZ dataset are outlined in Table 4.

Table 4 – DEZ types and API codes

DEZ type	API code
Rock outcrops greater than 0.2 hectares	API symbol ï cross hatch of varying density.
Wetlands	API map symbol ï reeds with, or without underline (Underline indicates permanent inundation).
Heath, sedge, and herb communities	API types ï F, D, Sc.
Low-density woodland communities	API map notation ï Pômt, Pômt Sc, Pômt sand, and by intersection of the forest type and total density crown cover themes.
Sand dunes	API map notation ï sand dunes, sand.

6.1.3 Disease status

Diverse ecotype zones are identified on the basis of their geological and ecotype values and disease status is not used as a parameter to include or exclude these from the informal reserve network.

6.2 Planning in relation to diverse ecotype zones

6.2.1 Introduction

The DEZ theme originated from the 1:25000 scale maps that were produced from API between 1951 and 1965. The term DEZ was first used in the FMP 1994-2003 and subsequently in the RFA analysis and negotiations. It includes the API categories of swamp, non-forest, rock, peppermint, dunes, sand and jarrah forest <30% total canopy density. Where disturbance operations are proposed it is necessary to ensure that the areas of mapped DEZ are located and defined.

All DEZ patches of an area equal to or greater than 40 hectares have been accredited under the RFA as a CAR informal reserve (RFA Agreement, Attachment 1 Clause 12(c), page 52).

6.2.2 Source information

The DEZ theme was developed from:

- Aerial photography circa 1950-60ôs was the source for the original API mapping;

- API maps and their digitised derivatives have provided the basis for DEZ mapping; and
- The API data themes are held in FMIS. DEZ are defined in the Departmentôs corporate database by vegetation codes. Some of this data is held in raster format and other has been captured or corrected using lineal digitization.

In forested categories of DEZ, the source dataset used to define the boundary of woodland DEZ relies upon an interpretation of relative crown cover from historical aerial photographs. In some instances, the crown cover recorded at that time reflected the impact of dieback disease on the forest structure rather than the underlying environmental characteristics of the site. The status of such areas can be reviewed and amended (if necessary) through the Informal Reserve Amendment process associated with pre-disturbance planning of operations.

6.2.3 Field inspection

Operational staff must inspect the target area to determine the presence or absence of mapped DEZ as identified in the corporate database. Field confirmation of DEZ must first consider the mapped occurrence generated for the operation. Ecological characteristics will be generally be used to determine the boundary of these zones, however in the case of low-density woodland communities the location of these has been determined and digitised from API types, and the boundaries will be located in the field by GPS, and no further assessment for this type is required of DEC or the proponent.

At the reconnaissance stage of planning, operational staff are required to inspect the area to determine whether there are:

(a) any areas which they consider meet the criteria for inclusion in the Departmentôs corporate database as a DEZ, but are not identified in that database; or

(b) any areas that are identified in the Departmentôs corporate database as DEZ that they consider do not meet the criteria for inclusion in that database; and

(c) maintain records of these inspections.

6.2.3.1 Opportunities

Operational planning

During site planning staff should be alert to identify areas with DEZ characteristics and report these for further assessment. This phase is the most practical and efficient time to identify DEZ that may be affected by disturbance operations such as recreation sites, infrastructure development and fire. At this early stage the widest range of options exist to relocate or alter the plans to ameliorate the effects on DEZ values.

Dieback interpretation

Areas proposed for significant ground disturbance have a dieback interpretation completed at an early stage of the harvest planning process. The interpreters should be alert to identify areas with DEZ characteristics and report these for further assessment.

Lignotuber surveys

Lignotuber surveys may be carried out in the jarrah forest as part of the harvest planning process. This work is commissioned by the FPC as part of their silvicultural planning requirements. This field assessment provides an opportunity for DEZ characteristics to be integrated as part of the survey output. The officer completing the survey should be alert to identify areas with DEZ characteristics and report these for further assessment.

Road / trail selection

Staff selecting roads or carrying out field verification of planned road alignments prior to roads being cleared and constructed should be alert to identify areas with DEZ characteristics and report these for further assessment. In forests with a heavy understorey, verification of proposed new road alignments is achieved through blade up scrub rolling of understorey. This allows for an increased area to be accessible for inspection before permanent disturbance takes place.

Treemarking

Treemarkers should be alert to identify significant patches with DEZ characteristics and report these for further assessment. Although there is an opportunity to identify and protect DEZ areas at this phase of the operation, this may have major operational and financial impact on proponent. All of the costs of planning and preparation of the harvesting cell will have been spent at this stage and the late removal of ñavailableò areas will reduce cost effectiveness of the operation.

6.2.4 Application of buffers

All DEZ are to incorporate a buffer of undisturbed vegetation around them. Ecological characteristics will used to determine the boundary of these zones, from which the buffers are to be applied. The recommended buffer widths from the edge of the DEZ types are shown on Table 5.

Table 5 – DEZ types and buffer widths

DEZ type	Buffer width / requirement
Rock outcrops greater than 0.2 hectares	Use furthest of either 10m; or the edge of the forest.
Wetlands	30m (reflects 50% of first order stream zone width)
Heath, sedge, and herb communities	30m (reflects 50% of first order stream zone width)
Low-density woodland communities	5m (based on no water related issues and no clear species change)
Sand dunes	Use furthest of either 20m; or 1x tree height (use co-dominant height of adjoining forest)

6.2.5 Management boundaries

Boundary tracks will generally not be required. However there will be instances where boundary tracks are necessary, and small areas of forest, which is available for disturbance operations, may be included inside the track with the DEZ. All tracks must have effective surface water management structures installed and maintained.

6.2.6 Responsibilities

It is the responsibility of the proponent of any operation to identify DEZ values and protect them during disturbance activities by undertaking the following:

- Field survey the area to confirm the existing boundary and / or extend the boundary outward from the defined location;
- Maintain records of the inspections;
- If necessary, complete and submit and ñInformal Reserve Amendmentò form;
- Demarcate the DEZ boundary in the field;
- Manage the operations outside the DEZ.

6.3 Implementation of disturbance activities in diverse ecotype zones

There are a wide range of activities that are currently undertaken in DEZ and that have the potential to disturb the values that the DEZ exhibit. The level of risk that these present and the management requirements and options associated with them vary considerably. The management issues associated with these activities are outlined below. Where a manager cannot resolve the issue by using these Guidelines, or where the manager is unsure of the consequences, then the proposal should be referred to a more senior officer for consideration and approval.

6.3.1 Demarcation

Demarcation of confirmed DEZ in conjunction with timber harvesting operations will be as defined for other informal reserves in the *"Contractors' Timber Harvesting Manual*ö. This requires white crosses to be painted on trees, with the cross facing away from the DEZ. The demarcation will be around the management boundary of the DEZ, and will include the DEZ, its buffer and any additional area that has been included for management convenience.

All DEZ are to be identified and demarcation completed before operations commence.

6.3.2 Flora and fauna management activities

6.3.2.1 Apiary sites

Where apiary sites are currently located within DEZ then they may continue to be used, providing that the apiarist does not create new tracks, damage standing trees or clear additional understorey. Apiary sites that are located in DEZ will be periodically inspected to ensure that their continued use is not degrading DEZ values. Existing apiary sites may be relocated out of DEZ at the discretion of the relevant Regional Manager of the Department.

In general the Department will not relocate current apiary sites, or create new apiary sites within DEZ. The FMP requires that proposals to locate an apiary site in a DEZ will be assessed on a case-by-case basis and require the approval in writing of the relevant Regional Manager of the Department. Proponents will need to demonstrate that the proposal will not significantly impact on the values for which the DEZ was established.

6.3.2.2 Wildflower harvesting

Wildflower harvesting of specific species that occur naturally in DEZ is permitted. The FMP Appendix 3 (page 91) requires the Department to prepare a list of such species and District Managers may endorse harvesting in DEZ for these species, where harvesting would not significantly impact on the values of the informal reserve. This should only be approved on a case-by-case basis where the proponent has demonstrated that the harvesting will not significantly impact on the values of the DEZ.

Where approved in DEZ, the activity of pickers in these areas will be monitored to ensure that wildflower picking does not lead to unnecessary disturbance of the values of the DEZ. Where there are signs of inappropriate harvesting technique, or excessive disturbance, the District Manager or their delegated officer will discuss the situation with the endorsed picker. If the inappropriate harvesting or disturbance continues then the District Manager will withdraw endorsement for harvesting in the DEZ for one or any of the species being picked.

6.3.2.3 Seed collection

Seed collection activities in DEZ will be endorsed and managed as outlined above for wildflower harvesting.

6.3.2.4 Predator and feral animal control

Existing predator and feral animal control activities such as baiting and trapping may be continued in DEZ. The authority for approving the continuation of these activities is the Departmental District Manager or their delegated officer.

New predator and feral animal control activities which involve construction of tracks, traps or clearing of the understorey in DEZ must be referred to Regional Managers for approval, prior to the work commencing.

6.3.2.5 Weed control

Existing weed control activities such as spraying or grubbing may be continued in DEZ. The authority for approving the continuation of these activities is the Departmental District Manager or their delegated officer.

New remedial treatment for weed control not involving machine entry may be considered and approved by the District Manager. New weed control activities that involve construction of tracks or clearing of the understorey in DEZ must be referred to Regional Managers for approval.

Where tree weeds have established in DEZ, especially adjacent to plantations or exotic species plots, then these trees should be considered for removal in conjunction with the harvest of the plantation or plot. Where they can be felled and extracted without machine intrusion into the DEZ, then commercial removal may be approved by the Regional Manager. For wider reserves where the logs are not accessible without machine intrusion into the DEZ, or for DEZ accredited as CAR informal reserves, then the commercial removal of the trees may be approved on a case-by-case basis by the Director, Sustainable Forest Management.

6.3.3 Fire management activities

The objectives for prescribed burning will be set taking into account the purpose and values sought to be protected in the burn. The burn prescription for an area that includes a DEZ must identify the DEZ and any other informal reserve and any special requirements with respect to prescribed burning. The burn objectives must take account of those special requirements.

6.3.3.1 Community protection burning

The inclusion of DEZ in areas burnt by low intensity prescribed fire to meet community protection or biodiversity objectives is generally acceptable with no special precautions to be applied.

6.3.3.2 Biodiversity management burning

Biodiversity management burning using low intensity prescribed fire is generally acceptable with no special precautions to be applied. Where biodiversity management burning with high intensity fire is proposed this may be approved by the relevant Department Regional Manager providing it is clearly defined within the prescribed fire plan.

6.3.3.3 Wildfire management

Suppression

In the event of wildfire, the Incident Management Teams should ensure that the Situation Officer is aware of SFM requirements and check for protection of the values contained in the DEZ. The protection of DEZ must receive consideration; however, this must be taken in the context of broader environmental values and other values threatened by the fire. For example it is not sensible to protect DEZ from fire, if this would require track construction with greater long-term environmental consequences or lead to higher value losses elsewhere.

Fire-line construction

Disturbance of DEZ during wildfire suppression activities is to be avoided where possible, and the identification of DEZ in wildfire suppression planning must take high priority.

Felling for burn security

The felling of burning trees for burn security reasons during fire suppression in DEZ requires the approval of the Incident Controller. The approval should be recorded in the Incident Log.

Rehabilitation

Disturbance from fire-line construction and felling for burn security within DEZ will be rehabilitated in the post-fire recovery process. Rehabilitation of fire-lines will be aimed at ameliorating erosion and compaction, minimising future erosion, restoring understorey cover and preventing future damage to trees by completing tops disposal. The particular requirements will be site specific and will be detailed in a Rehabilitation Plan for the incident.

All trees that have intersected with the fire-line will be considered for log salvage however the log should only be salvaged if it can be removed without further damage to standing trees within the DEZ, and without the machine needing to leave the fireline. Log extraction along the centreline of the log is permitted as it should not increase damage within the DEZ or create a new corridor of disturbance.

The rehabilitation work associated with trees felled for burn suppression, will be the cutting and stacking of tops and debris within 20 metres of the edge, tops disposal of trees and other works required for management of biodiversity and visual amelioration of the damage.

The use of harvesting machinery to assist with removal of the logs and stacking of tops is permitted. The use of harvesting machinery in the DEZ may be appropriate due to rapid recovery of understorey following the burn. The use of such machines should comply with appropriate hygiene management protocols. Care should be taken to minimise the amount of soil that is moved in this operation, as this will affect the regeneration of understorey following the fire. Any decision to allow harvesting machinery or earthmoving equipment to enter a DEZ to rehabilitate disturbance during an incident must be approved by the Incident Controller and recorded in the Incident Log.

6.3.3.4 Silvicultural burning

The inclusion of DEZ in both jarrah and karri silvicultural burning is to be avoided where practicable. Where this is not practical, due to burn security or the need for excessive disturbance to keep fire out of the DEZ, then burning of area is acceptable. This should be clearly defined within the prescribed fire plan for approval by the relevant Department Regional Manager.

Under no circumstances should the DEZ patch be subjected to a high intensity jarrah or karri silvicultural burn, without the written approval of the relevant Regional Manager.

6.3.3.5 Managing hazardous trees

It is important for DEC staff to manage public safety and burn security issues that are related to hazardous trees on public roads, facility developments and burn boundaries in the DEZ prior to burning. Consideration of these issues at the early stage will enable the implementation of non-destructive techniques to manage these trees. The options for managing these trees are outlined in Schedule 2 ï ñManaging hazardous treesò.

6.3.3.6 Construction and maintenance of water points

The construction and maintenance of water points for fire suppression is permitted. The requirements for the water point and its associated infrastructure will be as per Fire Operational Guideline No. 28- *"Water point construction and maintenance"* or its replacement Fire Operations Guideline.

6.3.4 Timber harvesting activities

6.3.4.1 Timber harvesting

Timber harvesting is excluded from DEZ and buffers, and harvesting machinery is prohibited from crossing the boundaries except for:

- removal of trees resulting from the clearing for an authorised road construction or upgrading; and
- removal of individual trees for safety reasons along public access roads, around recreation sites or adjacent to work sites.

Where the location of a DEZ has been added or altered as a result of planning inspections, an ñInformal Reserve Amendmentò form should be approved and **a new harvest coupe base plan issued** before harvesting can commence in areas adjoining the DEZ.

A tree within the boundary of a DEZ that presents a safety hazard to workers in the adjacent timber harvesting area may be felled, providing it has been tree-marked by a forest officer of the Department before it is felled. The relevant District office will retain a record of the decision.

Trees within the harvesting area should not be felled if they will fall into the DEZ. In instances where the tree accidentally falls into a DEZ, such trees may be salvaged according to the conditions outlined in Schedule 3 ï ñSalvage of logs in association with informal reservesò.

The faller is required to carry out manual cross cutting of crown material and manual tops disposal of crown material from the base of trees in the DEZ to a distance of 1m for material less than 75mm in diameter, and 5m for material greater than 75mm in diameter or piles of debris. The use of harvesting machinery to assist with tops disposal within DEZ is not permitted.

6.3.4.2 Craftwood

The collection of craftwood is not permitted from DEZ.

6.3.4.3 Firewood

Collection of domestic or commercial firewood is not permitted from DEZ.

6.3.4.3 Salvage of logs

Conditions for the salvage of logs are outlined in Schedule 3 ï ñSalvage of logs in association with informal reservesò.

6.3.5 Recreation activities

6.3.5.1 Recreation sites

There are many existing recreation sites that are situated within or adjacent to DEZ. The ongoing use and maintenance of these facilities will generally be continued and work may be approved by the District Manager. Any maintenance activity that requires the removal of trees, an expansion of the area of influence or permanent change to the understorey composition or structure on existing sites, must be referred to the Director, Sustainable Forest Management for approval.

The siting of permanent infrastructure associated with new recreation site development may occasionally be proposed in or adjacent to DEZ. These proposals will not generally be supported if they will affect the core of the patch, but may be acceptable on the boundary of the patch or in a buffer. Proposals for such disturbance will be assessed on a case-by-case basis, and require approval in writing from the Director, Sustainable Forest Management.

6.3.5.2 Tracks / trails

Schedule 4 ï ñManagement of Access in Informal Reserves and Other Protected Areas within State Forest and Timber Reservesò should be used as reference to determine the appropriate conditions for construction and maintenance work on tracks / trails in informal reserves.

The continued use of existing trails in DEZ will generally be permitted, and the District Manager may approve ongoing low level maintenance. Any maintenance activity which requires the removal of trees, an expansion of the area of influence or permanent change to the understorey composition or structure on existing sites, must be referred to the Director, Sustainable Forest Management and require approval in writing.

The construction of new permanent walk trails or boardwalks through DEZ will be considered using a risk-based approach, and require approval from the Director, Sustainable Forest Management.

If a new track or trail is proposed to cross a wetland DEZ, within an area proclaimed under RIWI Act as a ñSurface Water Areaò then an application to *"Interfere with Bed and Banks"* may be required from the DoW.

6.3.5.3 Interpretation

The installation of new permanent infrastructure associated with interpretation will not generally be supported in DEZ, but may be acceptable on the boundary of the DEZ or in the buffer. Proposals for such disturbance will be assessed on a case-by-case basis, and in conjunction with the cumulative effect of the associated trails.

6.3.6 Access roads

In general, new road construction is prohibited in DEZ. However, in some cases new roading is necessary, for example where stream crossings are required in timber harvesting operations or when the upgrade of an existing track through an informal reserve may be more environmentally acceptable than other options. Where road construction or upgrading within a DEZ is contemplated the circumstances require assessment on a case-by-case basis and written approval from the relevant Departmental Regional Manager. Schedule 4 ï ñManagement of Access in Informal Reserves and Other Protected Areas within State Forest and Timber Reservesò should be used as reference to determine the appropriate conditions.

6.3.6.1 Existing roads

Existing well-formed roads through DEZ may continue to be used through DEZ. It is important that any maintenance works (maintenance grading, slashing of verges and maintenance of pipes, sumps and offshoot drains) are carried out in such a way that they protect the DEZ values. The proponent should ensure that maintenance crews, machine operators and other contractors are closely supervised when working in these sensitive areas.

The relevant District Manager may approve all road maintenance works on the existing alignment, after the preparation of a detailed works prescription.

The decision to upgrade an existing track through any DEZ should not be treated lightly, and it must be demonstrated to be more environmentally acceptable than other options. Where upgrading within DEZ is contemplated the circumstances require assessment on a case-by-case basis and approval from the relevant Departmental Regional Manager.

6.3.6.2 New roads

In general, new road construction is prohibited in DEZ. However, in some cases new roading is necessary and where road construction within a DEZ is contemplated the circumstances require assessment on a case-by-case basis and approval from the relevant Departmental Regional Manager.

If a new road is proposed to cross a wetland DEZ, within an area proclaimed under RIWI Act as a ñSurface Water Areaò then an application to *"Interfere with Bed and Banks"* may be required from the DoW.

Roads and trails are significant potential sources for the introduction of *Phytophthora* and the placement of new roading will impact long-term management of protectable areas. The placement of new roads up-slope from DEZ is to generally be avoided, particularly for roads to be used in all weather conditions. Where it cannot be avoided the road should be located to minimise **both** the area of protectable, dieback free forest or DEZ put at risk, and the risk of infesting the DEZ.

Roads through DEZ will be constructed and maintained in a manner that minimises the environmental impact on the conservation and landscape values.

6.3.6.3 Disease implications

Where existing roads are up-slope from DEZ and the DEZ is protectable and dieback free, opportunities for the closure and rehabilitation should be sought, to minimise the risk of infesting the DEZ.

6.3.6.4 Closure / rehabilitation

In all cases the decision regarding the continued use or closure of any road is the responsibility of DEC, and the decision to close the road should be made by a DEC authorized person before any action is taken in the field. Where existing roads are identified for closure, then the road will be closed and rehabilitated to the standard required by DEC.

Where roads or tracks are closed, it is important that the rehabilitation techniques are carefully considered, and that the type and extent of work does not increase the magnitude of the disturbance. Detailed prescriptions outlining the extent of machine activity and proposed earthworks are required. The proponent and Departmental staff will closely supervise these activities, and the completed works will be inspected and signed off by the District Manager to ensure that the prescribed standards are achieved.

6.3.7 Research and inventory

6.3.7.1 Research plots

Where research plots are located in DEZ, then those that are based on low key monitoring, or observation, which will not result in the changes to the level of disturbance may remain in use. Plot maintenance activity which does not require the removal of trees, an expansion of the area of influence or permanent change to the understorey composition may continue, following advice by the research scientist to the relevant District Manager.

In some cases such as silvicultural research plots, there may be the expectation for a silvicultural treatment to be applied to the area that may include falling of trees, notching, or significant disturbance to the understorey structure or composition. These proposals are inconsistent with the management objectives for DEZ, and new research plots of this type should not be located in DEZ.

Where an existing plot of this nature forms part of a long-term project or there are limited options for alternative areas then these may be approved. This will require the review of the Research Management Plan, and endorsement by the Manager DEC Science, and the relevant Regional Manager.

6.3.7.2 Inventory plots

Where inventory plots are located in DEZ, then those based on low key monitoring, or observation, which will not result in the changes to the level of disturbance, may remain in use. Plot maintenance activity which does not require the removal of trees, an expansion of the area of influence or permanent change to the understorey composition may continue, following advice by the Manager, Forest Management Branch to the relevant District Manager.

Where plot maintenance is likely to require removal of standing trees, or major and periodic changes to the understorey structure (such as slashing of the understorey) then this will require the review of the Inventory purpose, and endorsement by the Manager, Forest Management Branch, and the relevant Regional Manager. New inventory plots of this nature should not be located in DEZ.

6.3.8 Public utilities

The siting of new permanent infrastructure associated with pubic utilities (such as powerlines, pipelines, roads or other easements) may occasionally be required in DEZ, buffers or adjacent to them. The proximity of the proposed utility to the DEZ may be important especially in the case of powerlines, because of the need to profile fall trees in the adjoining forest for line security. Proposals for such new disturbance will be assessed on a case-by-case basis, and will need to be approved by the Minister for the Environment.

If a new road associated with a public utility is proposed to cross a wetland DEZ, within an area proclaimed under RIWI Act as a ñSurface Water Areaò then an application to *"Interfere with Bed and Banks"* may be required from the DoW.

6.3.9 Basic raw materials

Existing extraction sites in DEZ should, where reasonable and practicable, be closed and rehabilitated. Vehicles involved in extraction of basic raw material are not permitted to enter DEZ unless the approval of the relevant Regional Manager has been obtained.

In the case of existing sites in DEZ, where it is not reasonable or practical for them to be closed and rehabilitated, these can continue to be used (subject to the preparation of a Pit Management Plan).

The commencement of new pits for the extraction of basic raw materials will not be approved in DEZ. Where alternative sources are not available or where there is a specific situation that may require this to be reconsidered, the Regional Manager should present a case to the Director, SFM for endorsement and for discussion with the Conservation Commission.

6.3.10 Mining

For existing operations the arrangements for protection the values contained in informal reserves vary for each individual company, tenement and types of mine. Different arrangements often exist for the extensive exploration phase than for the intensive and highly disturbing infrastructure construction, mining, transport or processing phase.

The siting of mining or permanent infrastructure associated with mining may occasionally be proposed in or adjacent to DEZ or buffers that are not intended to be mined. Proposals for such disturbance will be assessed on a case-by-case basis, and will need to be approved by the Minister for the Environment.

For new operations, the Department will make submissions in relation to mining and petroleum proposals submitted to it for comments or advice which seek to reduce the impact of those proposals on DEZ.

Schedule 5 outlines the process used by Alcoa Australia to manage proposed disturbances in CAR informal reserves within their tenement.

6.3.11 Public safety

A dangerous tree within the boundary of a DEZ or its designated buffer may be felled if it presents a safety hazard to workers in the area, or to the public, according to the following requirements:

- The proponent should request approval to fell trees in a DEZ because of safety concerns, by providing a description of the tree, a map, and a photograph of the tree;
- The proponent must demonstrate that they have considered non-destructive methods to make the tree safe, as part of the request to fell the tree;
- The relevant Departmental Regional Manager should authorise in writing the felling of a dangerous tree prior to the work commencing;
- The tree must be tree-marked by a forest officer of the Department; and
- The relevant District office will retain a record of the decision.

6.4 Monitoring

The Department will periodically monitor compliance with the requirements for management of DEZ, in accordance with the principles of the ñForest Monitoring Guidelineò. WIN / MLs will be used to monitor non-compliance with forest management requirement of the FMP or approved conditions for disturbance activities.

6.4.1 Audit

Management Audit Branch will periodically audit compliance with the requirements for management of DEZ.

6.5 Management of diverse ecotype zone data

The decision to amend the DEZ data is reserved for the Manager FMB, and no major changes can be made without authorization. The ñInformal Reserve Amendmentò form provides the record of the recommendation. These original forms are held and processed at FMB (Bentley).

Once the DEZ areas have been field inspected then the following actions are required:

(a) Areas considered to meet the criteria for inclusion in the corporate database, but which are not identified in that database, will be treated as informal reserves until they are added to the corporate database. These areas will be demarcated as DEZ in the field and on operational plans.

(b) Areas that are identified in the corporate database, but are not considered to meet the criteria for inclusion, may be treated as if they were not informal reserves. These areas need not be demarcated as DEZ in the field or on operational plans.

6.5.1 Amending DEZ data

For amendments to the boundary of mapped DEZ the following process is used;

- Inspect the mapped location in the field;
- For variations complete and submit and ñInformal Reserve Amendmentò form showing the actual location of the DEZ;

- Regional staff will field check the variation and make a recommendation to Manager FMB;
- Following approval the new location of the DEZ is corrected in the ñDEZò theme in the FMIS database;
- A new base print is issued for use by the proponent; and
- The proponent must manage the operation outside the new boundary.

6.5.1.1 Maps

Operational map products are developed incorporating the variation in location, but no specific DEZ zone map is produced.

Initial mapping is done from hand-held GPS track files, which are completed by FMB staff.

Final location and verification of the DEZ is done by FMB, following the disturbance, from aerial photography.

Where a change to the location or status of DEZ has been identified then FMB **must issue an amended operational base plan** before operational planning can be finalised and the operational approval granted.

In cases where amendments affect harvest coupe boundaries, the relevant Regional Manager of the Department must approve proposed variations to the boundaries and locations of DEZ in writing before any disturbance to these areas take place. A ñInformal Reserve Variationò form must be completed and submitted to the relevant Regional Manager for this purpose.

6.5.2 Records

The following records will be retained by FMB:

- ñInformal Reserve Amendmentò form; and
- Amended harvest coupe base plans or other operational base plan.

Data records in FMIS are subsequently amended by FMB to reflect the approved changes following digitization of map information. Contributing datasets will continue to be refined and routinely updated on an annual basis.

6.5.3 Custodianship

The custodianship of the FMIS database is assigned to the Manager, FMB.

7 Less well reserved vegetation complexes

7.1 Characteristics of less well reserved vegetation complexes

7.1.1 Definition

The FMP defines less well reserved vegetation complexes as;

"Vegetation complexes that have either;

i. less than five per cent of their pre-European area in existing or proposed formal and informal reserves; or

ii. between five and 10 per cent of their pre-European area in existing or proposed formal and informal reserves and less than 15 per cent of their pre-European area remaining."

The purpose of this informal reserve type is to provide additional protection for the less well reserved vegetation complexes that occur on State forest and timber reserves available for timber harvesting.

7.1.2 Structural characteristics

The forest types categorised as in the FMP are outlined below. The summaries indicated three aspects, firstly the proportion in existing reservation, secondly the proportion of the original extent remaining, and thirdly the target area for reservation as informal reserve.

1) Vegetation complexes with less than five per cent of pre-European area in existing and proposed formal plus informal reserves and that occur on State forest.

BLf (Balingup valley floors) - 0.7 per cent reserved, 5 per cent remaining, informally reserve 7 hectares on State forest

BT (Bridgetown) - 1.7 per cent reserved, 12 per cent remaining, informally reserve 301 hectares on State forest

Fo (Forrestfield) - 4.0 per cent reserved, 25 per cent remaining, informally reserve 12 hectares on State forest

ML (Mumballup) - 0.9 per cent reserved, 4 per cent remaining, informally reserve 1 hectare on State forest

NWg1 (Newgalup) - 4.2 per cent reserved, 6 per cent remaining, informally reserve 10 hectares on State forest

SC (Sidcup) - 4.3 per cent reserved, 31 per cent remaining, informally reserve 82 hectares on State forest

Wi (Williams) - 0.5 per cent reserved, 11 per cent remaining, informally reserve 2 hectares on State forest

Yd (Yelverton sandy deposits) - 2.8 per cent reserved, 12 per cent remaining, informally reserve 8 hectares on State forest

Yw (Yelverton valleys and depressions) - 1.8 per cent reserved, 12 per cent remaining, informally reserve 111 hectares on State forest

TP (Toponup) - 2.7 per cent reserved, 98 per cent remaining, informally reserve 121 hectares on State forest

2) Vegetation complexes with between five per cent and 10 per cent of pre-European area in existing and proposed formal plus informal reserves, and less than 15 per cent of pre-European area remaining and that occur on State forest.

NWf2 (Newgalup) -	5.7 per cent reserved, 9 per cent remaining, informally reserve 23 hectares on State forest

(# From FMP ï ñAppendix 3 ï Informal reservesò pages 93-94)

7.1.3 Disease status

Less well reserved vegetation complexes are identified on the basis of their remaining extent and reservation and disease status is not used as a parameter in the selection of these reserves.

7.1.4 Dimensions

There are no restrictions on dimension associated with the selection of these reserves.

7.2 Planning in relation to less well reserved vegetation complexes

7.2.1 Introduction

Where disturbance operations are proposed it is necessary to ensure that the areas of mapped less well reserved vegetation complexes are located and defined. During the planning of any disturbance operation base plans of the target area will be produced. These plans are developed directly from the Departmentôs corporate database. The plans show those areas of forest zoned in the approved forest management plan as less well reserved vegetation complexes. This will provide the first level of identification of less well reserved vegetation complexes for field operations staff.

7.2.2 Source information

The data on less well reserved vegetation complexes in the forest was developed as part of the FMP development and was described by Mattiske and Havel ï Vegetation mapping of the south-west forest regions of Western Australian RFA Report 49 (2000). The summary is contained in FMP ï Appendix 9.

7.2.3 Field inspection

Field confirmation of less well reserved vegetation complexes must first consider the mapped occurrence generated for the operation. At the reconnaissance stage of planning, operational staff are required to ensure that the area is inspected by a suitably qualified person to determine whether there are:

(a) any areas which they consider meet the criteria for inclusion in the Departmentôs corporate database as a less well reserved vegetation complex, but are not identified in that database; or

(b) any areas that are identified in the Departmentôs corporate database as a less well reserved vegetation complex that they consider do not meet the criteria for inclusion in that database; and

(c) maintain records of these inspections.

If the boundaries of the less well reserved vegetation complexes are found to be more extensive than the mapped extent, then the new boundary is to be located and used for all disturbance planning and implementation.

7.2.3.1 Opportunities

Operational planning

During site planning staff should be alert to identify areas with the characteristics of less well reserved vegetation complexes and report these for further assessment. This phase is the most practical and efficient time to identify such areas that may be affected by disturbance operations such as recreation sites, infrastructure development and fire. At this early stage the widest range of options exist to relocate or alter the plans to ameliorate the effects on the values of the less well reserved vegetation complex.

Dieback interpretation

Areas proposed for significant ground disturbance have a dieback interpretation completed at an early stage of the harvest planning process. The interpreters should be alert to identify areas with the characteristics of less well reserved vegetation complexes and report these for further assessment.

Road / trail selection

Staff selecting roads or carrying out field verification of planned road alignments prior to roads being cleared and constructed should be alert to identify areas with less well reserved vegetation complex characteristics and report these for further assessment.

Every attempt should be made to avoid the need for definition of less well reserved vegetation complexes exclusion areas this late in the harvest planning process, because the proponent will have expended significant effort at this time, and in some instances the alteration of the alignment will require a duplication of planning work associated with the alignment.

7.2.5 Application of buffers

There is no requirement to include buffers for management of less well reserved vegetation complexes.

7.2.6 Management boundaries

Boundary tracks will generally not be required. However there will be instances where boundary tracks are necessary, and small areas of forest, which is available for disturbance operations, may be included inside the track with the less well reserved vegetation complex. All tracks must have effective surface water management structures installed and maintained.

7.2.7 Responsibilities

It is the responsibility of the proponent of any operation to identify the full extent of less well reserved vegetation complexes and protect them during these activities by undertaking the following:

- Field survey the area to confirm the existing boundary and / or extend the boundary outward from the defined location;
- Maintain records of the inspections;
- If necessary, complete and submit and ñInformal Reserve Amendmentò form;
- Demarcate the less well reserved vegetation complex boundary in the field;
- Manage the operations outside the less well reserved vegetation complex.

7.3 Implementing and managing disturbance activities in less well reserved vegetation complexes

There are a wide range of activities that are currently undertaken in less well reserved vegetation complexes that have the potential to disturb the values that the less well reserved vegetation complexes exhibit. The level of risk that these present and the management requirements and options associated with them vary considerably. The management issues associated with these activities are outlined below. Where a manager cannot resolve the issue by using these Guidelines, or where the manager unsure of the consequences, then the proposal should be referred to a more senior officer for consideration and approval.

7.3.1 Demarcation

The boundary of the less well reserved vegetation complexes will be marked in the field using the boundary indicated in the Departmentôs corporate database and field interpretation based on the description of the vegetation complex from Mattiske Consulting (2000). Demarcation in conjunction with timber harvesting operations will be as defined for other informal reserves in the *"Contractors' Timber Harvesting Manual"*. The demarcation may include any additional area that has been included for management convenience.

All less well reserved vegetation complexes are to be identified and demarcation completed before operations commence.

7.3.2 Flora and fauna management activities

7.3.2.1 Apiary sites

Where apiary sites are currently located within less well reserved vegetation complexes then they may continue to be used, providing that the apiarist does not create new tracks, damage standing trees or clear additional understorey. Apiary sites that are located in less well reserved vegetation complexes will be periodically inspected to ensure that their continued use is not degrading less well reserved vegetation complex values. Existing apiary sites may be relocated out of less well reserved vegetation complexes at the discretion of the relevant Regional Manager of the Department.

In general the Department will not relocate current apiary sites, or create new apiary sites within less well reserved vegetation complexes. The FMP requires that proposals to locate an apiary site in an informal reserve will be assessed on a case-by-case basis and require the approval in writing of the relevant Regional Manager of the Department. The Regional Manager will need to be satisfied that the proposal will not significantly impact on the values for which the less well reserved vegetation complex.

7.3.2.2 Wildflower harvesting

Wildflower harvesting should not be approved in less well reserved vegetation complexes.

7.3.2.3 Seed Collection

Seed collection should not be approved in less well reserved vegetation complexes.

7.3.2.4 Predator and feral animal control

Existing predator and feral animal control activities such as baiting and trapping may be continued in less well reserved vegetation complexes. The authority for approving the continuation of these activities is the Departmental District Manager or their delegated officer.

New predator and feral animal control activities which involve construction of tracks, traps or clearing of the understorey in less well reserved vegetation complexes must be referred to Regional Managers for approval, prior to the work commencing.

7.3.2.5 Weed control

Existing weed control activities such as spraying or grubbing may be continued in less well reserved vegetation complexes. The authority for approving the continuation of these activities is the Departmental District Manager or their delegated officer.

Where tree weeds have established in less well reserved vegetation complexes, especially adjacent to plantations or exotic species plots, then these trees should be considered for removal in conjunction with the harvest of the plantation or plot. Where they can be felled and extracted without machine intrusion into the less well reserved vegetation complex, then commercial removal may be approved by the Regional Manager. Where the logs are not accessible without machine intrusion into the less well reserved vegetation complex, then the commercial removal of the trees may be approved on a case-by-case basis by the Director, Sustainable Forest Management.

New remedial treatment for weed control not involving machine entry may be considered and approved by the District Manager. New weed control activities that involve construction of tracks or clearing of the understorey in less well reserved vegetation complexes must be referred to Regional Managers for approval.

7.3.3 Fire management activities

The objectives for prescribed burning will be set taking into account the purpose and values sought to be protected in the burn. The burn prescription for an area that includes a less well reserved vegetation complex must identify the less well reserved vegetation complex and any other informal reserve and any special requirements with respect to prescribed burning. The burn objectives must take account of those special requirements.

7.3.3.1 Community protection burning

The inclusion of less well reserved vegetation complexes in areas burnt by low intensity prescribed fire to meet community protection or biodiversity objectives is generally acceptable with no special precautions to be applied.

7.3.3.2 Biodiversity management burning

Biodiversity management burning using low intensity prescribed fire is generally acceptable with no special precautions to be applied. Where biodiversity management burning with high intensity fire is proposed this may be approved by the relevant Department Regional Manager providing the particular less well reserved vegetation complex is identified and is clearly defined within the prescribed fire plan.

7.3.3.3 Wildfire management

Suppression

In the event of wildfire, the Incident Management Teams should ensure that the Situation Officer is aware of SFM requirements and check for protection of the values contained in the less well reserved vegetation complexes. The protection of less well reserved vegetation complex must receive consideration; however, this must be taken in the context of broader environmental values and other values threatened by the fire. For example it is not sensible to protect less well reserved vegetation complex from fire, if this would require track construction with greater long-term environmental consequences or lead to higher value losses elsewhere.

Fire-line construction

Disturbance of less well reserved vegetation complexes during wildfire suppression activities is to be avoided where possible, and the identification of less well reserved vegetation complex in wildfire suppression planning must take high priority.

Felling for burn security

The felling of burning trees for burn security reasons during fire suppression in less well reserved vegetation complexes requires the approval of the Incident Controller. The approval should be recorded in the Incident Log.

Rehabilitation

Disturbance from fire-line construction, felling for burn security within less well reserved vegetation complexes will be rehabilitated in the post-fire recovery process. Rehabilitation of fire-lines will be aimed at ameliorating erosion and compaction, minimising future erosion, restoring understorey cover and preventing future damage to trees by completing tops disposal. The particular requirements will be site specific and will be detailed in a Rehabilitation Plan for the incident.

All trees that have intersected with the fire-line will be considered for log salvage however the log should only be salvaged if it can be removed without further damage to standing trees within the informal reserve, and without the machine needing to leave the fireline. Log extraction along the centreline of the log is permitted as it should not increase damage within the informal reserve or create a new corridor of disturbance.

The rehabilitation work associated with trees felled for burn suppression, will be the cutting and stacking of tops and debris within 20 metres of the edge, tops disposal of trees and other works required for management of biodiversity and visual amelioration of the damage.

The use of harvesting machinery to assist with removal of the logs and stacking of tops is permitted. The use of harvesting machinery in the less well reserved vegetation complex may be appropriate due to rapid recovery of understorey following the burn. The use of such machines should comply with appropriate hygiene management protocols. Care should be taken to minimise the amount of soil that is moved in this operation, as this will affect the regeneration of understorey following the fire. Any decision to allow harvesting machinery or earthmoving equipment to enter a less well reserved vegetation complex to rehabilitate disturbance during an incident must be approved by the Incident Controller and recorded in the Incident Log.

7.3.3.4 Silvicultural burning

The inclusion of less well reserved vegetation complex in both jarrah and karri regeneration burning is to be avoided where practicable. This requirement is targeted at to increasing the short-term biodiversity benefits of retained vegetation undisturbed by harvesting. Where this is not practical, due to burn security or the need for excessive disturbance to keep fire out of the less well reserved vegetation complex, then prescribed burning of area is acceptable. The particular less well reserved vegetation complex should be clearly defined within the prescribed fire plan for approval by the relevant Department Regional Manager.

Under no circumstances should the less well reserved vegetation complex be subjected to a high intensity silvicultural burn, without the written approval of the relevant Regional Manager.

7.3.3.5 Hazardous trees

It is important for DEC staff to manage public safety and burn security issues that are related to hazardous trees on public roads, facility developments and burn boundaries in the less well reserved vegetation complex prior to burning. Consideration of these issues at the early stage will enable the implementation of non-destructive techniques to manage these trees. The options for managing these trees are outlined in Schedule 2 ï ñManaging hazardous treesò.

7.3.3.6 Construction and maintenance of water points

The construction of new water points for fire suppression is not permitted in less well reserved vegetation complexes.

The requirements for the maintenance of water point and its associated infrastructure will be as per Fire Operational Guideline No. 28- *"Water point construction and maintenance*ò or its replacement Fire Operations Guideline.

7.3.4 Timber harvesting activities

7.3.4.1 Timber harvesting

Timber harvesting is excluded from less well reserve vegetation complexes, and harvesting machinery is prohibited from crossing the boundaries except for:

- removal of trees resulting from the clearing for an authorised road construction or upgrading; and
- removal of individual trees for safety reasons along public access roads, around recreation sites or adjacent to work sites.

A tree within the boundary of a less well reserved vegetation complex that presents a safety hazard to workers in the adjacent timber harvesting area may be felled, providing it has been tree-marked by a forest officer of the Department before it is felled. The relevant District office will retain a record of the decision.

Trees within the harvesting area should not be felled if they will fall into the less well reserved vegetation complex. In instances where the tree accidentally falls into a less well reserved vegetation complex, such trees may be salvaged according to the conditions outlined in Schedule 3 ï ñSalvage of logs in association with informal reservesò.

Even when salvage is not permitted the faller is required to carry out manual cross cutting of crown material and manual tops disposal of crown material from the base of trees in the less well reserved vegetation complex to a distance of 1m for material less than 75mm in diameter, and 5m for material greater than 75mm in diameter or piles of debris. The use of harvesting machinery to assist with tops disposal within the informal reserve is not permitted.

7.3.4.2 Craftwood

The collection of craftwood is not permitted from less well reserved vegetation complexes.

7.3.4.3 Firewood

Collection of domestic or commercial firewood is not permitted from less well reserved vegetation complexes.

7.3.4.4 Salvage of logs

Conditions for the salvage of logs are outlined in Schedule 3 ï ñSalvage of logs in association with informal reservesò.

7.3.5 Recreation activities

7.3.5.1 Recreation sites

The ongoing use and maintenance of any existing recreation facilities in less well reserved vegetation complexes will generally be continued and minor maintenance work may be approved by the District Manager. Any maintenance activity that requires the removal of trees, an expansion of the area of

influence or permanent change to the understorey composition or structure on existing sites, must be referred to the Director, Sustainable Forest Management for approval.

New recreation site development and permanent infrastructure should not be planned for or approved in less well reserved vegetation complexes.

Proposals affecting the boundary of a less well reserved vegetation complex should identify which particular less well reserved vegetation complex is affected by the proposal. Each proposal will be assessed on a case-by-case basis, and require approval in writing from the Director, Sustainable Forest Management.

7.3.5.2 Tracks / trails

Schedule 4 ï ñManagement of Access in Informal Reserves and Other Protected Areas within State Forest and Timber Reservesò should be used as reference to determine the appropriate conditions for construction and maintenance work on tracks / trails in informal reserves.

The continued use of existing trails in less well reserved vegetation complexes will generally be permitted, and the District Manager may approve ongoing low level maintenance. Any maintenance activity which requires the removal of trees, an expansion of the area of influence or permanent change to the understorey composition or structure on existing sites, must be referred to the Director, Sustainable Forest Management and require approval in writing.

The construction of new permanent walk trails or boardwalks through less well reserved vegetation complex will be considered using a risk-based approach, and require approval from the Director, Sustainable Forest Management. The proposal submitted by the proponent should identify each particular less well reserved vegetation complex that is likely to be affected by the proposal.

7.3.5.3 Interpretation

The installation of new permanent infrastructure associated with interpretation will not generally be supported in less well reserved vegetation complexes. Proposals for such disturbance should identify which particular less well reserved vegetation complex is affected by the proposal, and will be assessed on a case-by-case basis, and in conjunction with the cumulative effect of the associated trails.

7.3.6 Access roads

In general, new road construction should not occur in less well reserved vegetation complexes. Schedule 4 ï ñManagement of Access in Informal Reserves and Other Protected Areas within State Forest and Timber Reservesò should be used as reference to determine the appropriate conditions.

7.3.6.1 Existing roads

Existing well-formed roads may continue to be used through less well reserved vegetation complexes. It is important that any maintenance works (maintenance grading, slashing of verges and maintenance of pipes, sumps and offshoot drains) are carried out in such a way that they protect the less well reserved vegetation complex values. The proponent should ensure that maintenance crews, machine operators and other contractors are closely supervised when working in these sensitive areas.

The relevant District Manager may approve all road maintenance works on the existing alignment, after the preparation of a detailed works prescription.

The decision to upgrade an existing track through any less well reserved vegetation complex should not be treated lightly, and it must be demonstrated to be more environmentally acceptable than other options. Where upgrading within less well reserved vegetation complex is contemplated the proponent should identify which particular less well reserved vegetation complex is affected by the

proposal, for consideration on a case-by-case basis and approval from the relevant Departmental Regional Manager.

7.3.6.2 New roads

Where new roading is necessary within a less well reserved vegetation complex the road should be located to minimise **both** the area of protectable, dieback free forest or less well reserved vegetation complex put at risk, and the risk of infesting the less well reserved vegetation complex. The proponent should identify the areas put at risk, disease vectors, and possible alternatives for consideration on a case-by-case basis and approval from the relevant Departmental Regional Manager.

Roads and trails are significant potential sources for the introduction of *Phytophthora* and the placement of new roading will impact long-term management of protectable areas. The placement of roads up-slope from less well reserved vegetation complexes is to generally be avoided, particularly for roads to be used in all weather conditions, to minimise the risk of infesting the less well reserved vegetation complexes.

Roads through less well reserved vegetation complexes will be constructed and maintained in a manner that minimises the environmental impact on the conservation and landscape values.

7.3.6.3 Disease implications

Where existing roads are up-slope from less well reserved vegetation complexes, opportunities for the closure and rehabilitation should be sought, to minimise the risk of infesting the less well reserved vegetation complex.

7.3.6.4 Closure / rehabilitation

In all cases the decision regarding the continued use or closure of any road is the responsibility of DEC, and the decision to close the road should be made by a DEC authorized person before any action is taken in the field. Where existing roads are identified for closure, then the road will be closed and rehabilitated to the standard required by DEC.

Where roads or tracks are closed, it is important that the rehabilitation techniques are carefully considered, and that the type and extent of work does not increase the magnitude of the disturbance. Detailed prescriptions outlining the extent of machine activity and proposed earthworks are required. The proponent and Departmental staff will closely supervise these activities, and the completed works will be inspected and signed off by the District Manager to ensure that the prescribed standards are achieved.

7.3.7 Research and inventory

7.3.7.1 Research plots

Where research plots are currently located in areas of forest that have been classified as less well reserved vegetation complex these plots may remain in use, and plot maintenance activity which does not requires the removal of trees, an expansion of the area of influence or permanent change to the understorey composition may continue, following advice by the research scientist to the relevant District Manager.

In some cases such as silvicultural research plots, there may be the expectation for a silvicultural treatment to be applied to the area that may include falling of trees, notching, or significant disturbance to the understorey structure or composition. These proposals are inconsistent with the management objectives for less well reserved vegetation complexes, and new research plots of this type should not be located in less well reserved vegetation complexes.

Where an existing plot of this nature forms part of a long-term project or there are limited options for alternative areas then these may be approved. This will require the review of the Research Management Plan, and endorsement by the Manager DEC Science, and the relevant Regional Manager.

7.3.7.2 Inventory plots

Where inventory plots are currently located in areas of forest that have been classified as less well reserved vegetation complexes, these plots may remain in use, and plot maintenance activity which does not require the removal of trees, an expansion of the area of influence or permanent change to the understorey composition may continue, following advice by the Manager, Forest Management Branch to the relevant District Manager.

Where plot maintenance is likely to require removal of standing trees, or major and periodic changes to the understorey structure (such as slashing of the understorey) then this will require the review of the Inventory purpose, and endorsement by the Manager, Forest Management Branch, and the relevant Regional Manager. New inventory plots of this nature should not be located in a less well reserved vegetation complex.

7.3.8 Public utilities

The siting of new permanent infrastructure associated with pubic utilities (such as powerlines, pipelines, roads or other easements) may occasionally be required in less well reserved vegetation complexes. The proximity of the proposed utility to the complex may be important especially in the case of powerlines, because of the need to profile fall trees in the adjoining forest for line security. Proposals for such new disturbance will be assessed through an environmental impact assessment process under the Environmental Protection Act on a case-by-case basis, and will need to be approved by the Minister for the Environment.

The Department will make submissions in relation to proposals for the establishment of infrastructure submitted to it for comments or advice which seek to reduce the impact of those proposals on less well reserved vegetation complexes.

7.3.9 Basic raw materials

The extraction of basic raw materials will not be permitted in less well reserved vegetation complexes. Vehicles involved in extraction of basic raw material are not permitted to enter the less well reserved vegetation complexes unless the approval of the relevant Regional Manager has been obtained.

Existing extraction sites in less well reserved vegetation complexes should, where reasonable and practicable, be closed and rehabilitated.

7.3.10 Mining

For existing operations the arrangements for protection the values contained in informal reserves vary for each individual company, tenement and types of mine. Different arrangements often exist for the extensive exploration phase than for the intensive and highly disturbing infrastructure construction, mining, transport or processing phase.

The siting of mining or permanent infrastructure associated with mining may occasionally be proposed in or adjacent to less well reserved vegetation complexes or buffers that are not intended to be mined. Proposals for such disturbance will be assessed through an environmental impact assessment process under the Environmental Protection Act on a case-by-case basis, and will need to be approved by the Minister for the Environment.

For new operations, the Department will make submissions in relation to mining and petroleum proposals submitted to it for comments or advice which seek to reduce the impact of those proposals on less well reserved vegetation complexes.

Schedule 5 outlines the process used by Alcoa Australia to manage proposed disturbances in CAR informal reserves within their tenement.

7.3.11 Public safety

A dangerous tree within the boundary of a less well reserved vegetation complex may be felled if it presents a safety hazard to workers in the area, or to the public, according to the following requirements:

- The proponent should request approval to fell trees in a less well reserved vegetation complex because of safety concerns, by providing a description of the tree, a map, and a photograph of the tree;
- The proponent must demonstrate that they have considered non-destructive methods to make the tree safe, as part of the request to fell the tree;
- The relevant Departmental Regional Manager should authorise in writing the felling of a dangerous tree prior to the work commencing;
- The tree must be tree-marked by a forest officer of the Department; and
- The relevant District office will retain a record of the decision.

7.4 Monitoring

The Department will periodically monitor compliance with the requirements for management of less well reserved vegetation complexes, in accordance with the principles of the ñForest Monitoring Guidelineò. WIN / MLs will be used to monitor non-compliance with forest management requirement of the FMP or approved conditions for disturbance activities.

7.4.1 Audit

Management Audit Branch will periodically audit compliance with the requirements for management of less well reserved vegetation complexes.

7.5 Management of less well reserved vegetation complex data

The decision to amend the less well reserved vegetation complex data is reserved for the Manager FMB, and no major changes can be made without authorization. The ñInformal Reserve Amendmentò form provides the record of the recommendation. These original forms are held and processed at FMB (Bentley).

7.5.1 Amending less well reserved vegetation complex data

For amendments to the boundary of mapped less well reserved vegetation complexes, the following process is used;
Inspect the mapped location in the field with the assistance of a person with experience in identifying and defining vegetation complexes;

- For variations complete and submit and ñInformal Reserve Amendmentò form showing the actual location of the boundary of the complex;

- Regional staff or FMB staff will field check the variation and make a recommendation to Manager FMB;
- Following approval the new location of the complex is corrected in the FMIS database;
- A new base print is issued for use by the proponent.

7.5.1.1 Maps

Operational map products are developed incorporating the variation in location, but no specific poorly reserved forest ecosystem map is produced.

Initial mapping is done from hand-held GPS track files, which are completed by FMB staff.

Final location and verification of the complex is done by FMB, following the disturbance, from GPS track files and aerial photography.

Where changes to the location or status of a less well reserved vegetation complex have been identified then FMB **must issue an amended operational base plan** before operational planning can be finalised and the operational approval granted.

In cases where amendments affect harvest coupe boundaries, the relevant Regional Manager of the Department must approve proposed variations to the boundaries and locations of less well reserved vegetation complexes in writing before any disturbance to these areas take place. An ñInformal Reserve Variationò form must be completed and submitted to the relevant Regional Manager for this purpose.

7.5.2 Records

The following records will be retained by FMB:

- ñInformal Reserve Amendmentò form; and
- Amended harvest coupe base plans or other operational base plan.

Data records in FMIS are subsequently amended by FMB to reflect the approved changes following digitization of map information.

There will be periodic amendment to the contributing datasets to reflect major changes to the less well reserved vegetation complex theme.

7.5.3 Custodianship

The custodianship of the FMIS databases is assigned to the Manager, FMB.

8 Poorly reserved forest ecosystem

8.1 Characteristics of poorly reserved forest ecosystem

8.1.1 Definition

The FMP defines poorly reserved forest ecosystem as;
"Darling Scarp forest ecosystem that has less than 15 per cent of pre-European area in existing or proposed formal plus CAR informal reserves."

8.1.2 Structural characteristics

The forest type categorised as poorly reserved forest ecosystem in the FMP is outlined below. The summary indicates three aspects, firstly the proportion in existing reservation, secondly the proportion of the original extent remaining, and thirdly the target area for reservation as informal reserve.

(1) Forest ecosystem that has less then 15% of pre-European area in existing or proposed formal plus CAR informal reserves.

Darling scarp - 4.8 per cent reserved, 34 per cent remaining, informally reserve 250 hectares on State forest

8.1.3 Disease status

The poorly reserved forest ecosystem has been identified on the basis of its reservation and disease status is not used as a parameter in the selection of this ecosystem as an informal reserve.

8.1.4 Dimensions

There are no restrictions on dimension associated with the selection of this ecosystem.

8.2 Planning in relation to poorly reserved forest ecosystem

8.2.1 Introduction

Where disturbance operations are proposed it is necessary to ensure that the areas of mapped poorly reserved forest ecosystem are located and defined. During the planning of any disturbance operation base plans of the target area will be produced. These plans are developed directly from the Departmentôs corporate database. The plans show those areas of forest zoned in the approved forest management plan as a poorly reserved forest ecosystem. This will provide the first level of identification of a poorly reserved forest ecosystem for field operations staff.

The data on poorly reserved forest ecosystems in the forest was developed as part of the FMP development and was described by Bradshaw and Mattiske ï Forest Ecosystem Mapping for the Western Australian RFA Report 5 (1997). The summary is contained in FMP - Appendix 9.

8.2.3 Field inspection

Field confirmation of poorly reserved forest ecosystems must first consider the mapped occurrence generated for the operation. At the reconnaissance stage of planning, operational staff are required to ensure that the area is inspected by a suitably qualified person to determine whether there are:

(a) any areas which they consider meet the criteria for inclusion in the Departmentôs corporate database as a poorly reserved forest ecosystem, but are not identified in that database; or

(b) any areas that are identified in the Departmentôs corporate database as a poorly reserved forest ecosystem that they consider do not meet the criteria for inclusion in that database; and

(c) maintain records of these inspections.

If the boundaries of the poorly reserved forest ecosystems are found to be more extensive than the mapped extent, then the new boundary is to be located and used for all disturbance planning and implementation.

8.2.3.1 Opportunities

Operational planning

During site planning staff should be alert to identify areas with poorly reserved forest ecosystem characteristics and report these for further assessment. This phase is the most practical and efficient time to identify poorly reserved forest ecosystems that may be affected by disturbance operations such as recreation sites, infrastructure development and fire. At this early stage the widest range of options exist to relocate or alter the plans to ameliorate the effects on the values of the poorly reserved forest ecosystem.

Dieback interpretation

Areas proposed for significant ground disturbance have a dieback interpretation completed at an early stage of the harvest planning process. The interpreters should be alert to identify areas with the characteristics of poorly reserved forest ecosystems and report these for further assessment.

Road / trail selection

Staff selecting roads or carrying out field verification of planned road alignments prior to roads being cleared and constructed should be alert to identify areas with poorly reserved forest ecosystem characteristics and report these for further assessment.

Every attempt should be made to avoid the need for definition of poorly reserved forest ecosystem exclusion areas this late in the harvest planning process, because the proponent will have expended significant effort at this time, and in some instances the alteration of the alignment will require a duplication of planning work associated with the alignment.

8.2.5 Application of buffers

There is no requirement to include buffers for management of poorly reserved forest ecosystems.

8.2.4 Management boundaries

Boundary tracks will generally not be required. However there will be instances where boundary tracks are necessary, and small areas of forest, which is available for disturbance operations, may be included inside the track with the poorly reserved forest ecosystem. All tracks must have effective surface water management structures installed and maintained.

8.2.4 Responsibilities

It is the responsibility of the proponent of any operation to identify the full extent of a poorly reserved forest ecosystem and protect them during these activities by undertaking the following:

- Field survey the area to confirm the existing boundary and / or extend the boundary outward from the defined location;

- Maintain records of the inspections;
- If necessary, complete and submit and ñInformal Reserve Amendmentò form;
- Demarcate the poorly reserved forest ecosystem boundary in the field;
- Manage the operations outside the poorly reserved forest ecosystem.

8.3 Implementation of disturbance activities in poorly reserved forest ecosystems

There are a wide range of activities that are currently undertaken in poorly reserved forest ecosystem and that have the potential to disturb the values that the poorly reserved forest ecosystem exhibit. The level of risk that these present and the management requirements and options associated with them vary considerably. The management issues associated with these activities are outlined below. Where a manager cannot resolve the issue by using these Guidelines, or where the manager is unsure of the consequences, then the proposal should be referred to a more senior officer for consideration and approval.

8.3.1 Demarcation

The boundary of the poorly reserved forest ecosystem will be marked in the field using the boundary indicated in the Departmentôs corporate database and field interpretation based on the description of the vegetation ecosystem from an FMIS database. Demarcation in conjunction with timber harvesting operations will be as defined for other informal reserves in the *"Contractors' Timber Harvesting Manual"*. The demarcation may include any additional area that has been included for management convenience.

All poorly reserved forest ecosystems are to be identified and demarcation completed before operations commence.

8.3.2 Flora and fauna management activities

8.3.2.1 Apiary sites

Where apiary sites are currently located within poorly reserved forest ecosystem then they may continue to be used, providing that the apiarist does not create new tracks, damage standing trees or clear additional understorey. Apiary sites that are located in poorly reserved forest ecosystem will be periodically inspected to ensure that their continued use is not degrading poorly reserved forest ecosystem values. Existing apiary sites may be relocated out of poorly reserved forest ecosystems at the discretion of the relevant Regional Manager of the Department.

In general the Department will not relocate current apiary sites, or create new apiary sites within poorly reserved forest ecosystem. The FMP requires that proposals to locate an apiary site in a poorly reserved forest ecosystem will be assessed on a case-by-case basis and require the approval in writing of the relevant Regional Manager of the Department. The Regional Manager will need to be satisfied that the proposal will not significantly impact on the values for which the informal reserve was established.

8.3.2.2 Wildflower harvesting

Wildflower harvesting collection should not be approved in poorly reserved forest ecosystems.

8.3.2.3 Seed collection

Seed collection should not be approved in poorly reserved forest ecosystems.

8.3.2.4 Predator and feral animal control

Existing predator and feral animal control activities such as baiting and trapping may be continued in poorly reserved forest ecosystem. The authority for approving the continuation of these activities is the Departmental District Manager or their delegated officer.

New predator and feral animal control activities which involve construction of tracks, traps or clearing of the understorey in poorly reserved forest ecosystem must be referred to Regional Managers for approval, prior to the work commencing.

8.3.2.5 Weed control

Existing weed control activities such as spraying or grubbing may be continued in a poorly reserved forest ecosystem. The authority for approving the continuation of these activities is the Departmental District Manager or their delegated officer.

Where tree weeds have established in poorly reserved forest ecosystems, especially adjacent to plantations or exotic species plots, then these trees should be considered for removal in conjunction with the harvest of the plantation or plot. Where they can be felled and extracted without machine intrusion into the poorly reserved forest ecosystem, then commercial removal may be approved by the Regional Manager. For wider reserves where the logs are not accessible without machine intrusion into the poorly reserved forest ecosystem, then the commercial removal of the trees may be approved on a case-by-case basis by the Director, Sustainable Forest Management.

New remedial treatment for weed control not involving machine entry may be considered and approved by the District Manager. New weed control activities that involve construction of tracks or clearing of the understorey in poorly reserved forest ecosystem must be referred to Regional Managers for approval.

8.3.3 Fire management activities

The objectives for prescribed burning will be set taking into account the purpose and values sought to be protected in the burn. The burn prescription for an area that includes a poorly reserved forest ecosystem must identify the poorly reserved forest ecosystem and any other informal reserve and any special requirements with respect to prescribed burning. The burn objectives must take account of those special requirements.

8.3.3.1 Community protection burning

The inclusion of poorly reserved forest ecosystem in areas burnt by low intensity prescribed fire to meet community protection or biodiversity objectives is generally acceptable with no special precautions to be applied.

8.3.3.2 Biodiversity management burning

Biodiversity management burning using low intensity prescribed fire is generally acceptable with no special precautions to be applied. Where biodiversity management burning with high intensity fire is proposed this may be approved by the relevant Department Regional Manager providing it is clearly defined within the prescribed fire plan.

8.3.3.3 Wildfire management

Suppression

In the event of wildfire, the Incident Management Teams should ensure that the Situation Officer is aware of SFM requirements and check for protection of the values contained in the poorly reserved forest ecosystem. The protection of poorly reserved forest ecosystem must receive consideration; however, this must be taken in the context of broader environmental values and other values threatened by the fire. For example it is not sensible to protect poorly reserved forest ecosystem from

fire, if this would require track construction with greater long-term environmental consequences or lead to higher value losses elsewhere.

Fire-line construction

Disturbance of poorly reserved forest ecosystem during wildfire suppression activities is to be avoided where possible, and the identification of poorly reserved forest ecosystem in wildfire suppression planning must take high priority.

Felling for burn security

The felling of burning trees for burn security reasons during fire suppression in poorly reserved forest ecosystems requires the approval of the Incident Controller. The approval should be recorded in the Incident Log.

Rehabilitation

Disturbance from fire-line construction, felling for burn security within poorly reserved forest ecosystem will be rehabilitated in the post-fire recovery process. Rehabilitation of fire-lines will be aimed at ameliorating erosion and compaction, minimising future erosion, restoring understorey cover and preventing future damage to trees by completing tops disposal. The particular requirements will be site specific and will be detailed in a Rehabilitation Plan for the incident.

All trees that have intersected with the fire-line will be considered for log salvage however the log should only be salvaged if it can be removed without further damage to standing trees within the informal reserve, and without the machine needing to leave the fireline. Log extraction along the centreline of the log is permitted as it should not increase damage within the informal reserve or create a new corridor of disturbance.

The rehabilitation work associated with trees felled for burn suppression, will be the cutting and stacking of tops and debris within 20 metres of the edge, tops disposal of trees and other works required for management of biodiversity and visual amelioration of the damage.

The use of harvesting machinery to assist with removal of the logs and stacking of tops is permitted. The use of harvesting machinery in the poorly reserved forest ecosystem may be appropriate due to rapid recovery of understorey following the burn. The use of such machines should comply with appropriate hygiene management protocols. Care should be taken to minimise the amount of soil that is moved in this operation, as this will affect the regeneration of understorey following the fire. Any decision to allow harvesting machinery or earthmoving equipment to enter a poorly reserved forest ecosystem to rehabilitate disturbance during an incident must be approved by the Incident Controller and recorded in the Incident Log.

8.3.3.4 Silvicultural burning

The inclusion of poorly reserved forest ecosystem in jarrah regeneration burning is to be avoided where practicable. This requirement is targeted at to increasing the short-term biodiversity benefits of retained vegetation undisturbed by harvesting. Where this is not practical, due to burn security or the need for excessive disturbance to keep fire out of the poorly reserved forest ecosystem, then prescribed burning of area is acceptable. This should be clearly defined within the prescribed fire plan for approval by the relevant Department Regional Manager.

Under no circumstances should the poorly reserved forest ecosystem be subjected to a high intensity silvicultural burn, without the written approval of the relevant Regional Manager.

8.3.3.5 Hazardous trees

It is important for DEC staff to manage public safety and burn security issues that are related to hazardous trees on public roads, facility developments and burn boundaries in the poorly reserved forest ecosystem prior to burning. Consideration of these issues at the early stage will enable the implementation of non-destructive techniques to manage these trees. The options for managing these trees are outlined in Schedule 2 ï ñManaging hazardous treesò.

8.3.3.6 Construction and maintenance of water points

The construction of new water points for fire suppression is not permitted in a poorly reserved forest ecosystem.

The requirements for the maintenance of water point and its associated infrastructure will be as per Fire Operational Guideline No. 28- *"Water point construction and maintenance*ò or its replacement Fire Operations Guideline.

8.3.4 Timber harvesting activities

8.3.4.1 Timber harvesting

Timber harvesting is excluded from poorly reserved forest ecosystems, and harvesting machinery is prohibited from crossing the boundaries except for:

- removal of trees resulting from the clearing for an authorised road construction or upgrading; and
- removal of individual trees for safety reasons along public access roads, around recreation sites or adjacent to work sites.

A tree within the boundary of a poorly reserved forest ecosystem that presents a safety hazard to workers in the adjacent timber harvesting area may be felled, providing it has been tree-marked by a forest officer of the Department before it is felled. The relevant District office will retain a record of the decision.

Trees within the harvesting area should not be felled if they will fall into the poorly reserved forest ecosystem. In instances where the tree accidentally falls into a poorly reserved forest ecosystem, such trees may be salvaged according to the conditions outlines in Schedule 3 ï ñSalvage of logs in association with informal reservesò.

Even when salvage is not permitted the faller is required to carry out manual cross cutting of crown material and manual tops disposal of crown material from the base of trees in the poorly reserved forest ecosystem to a distance of 1m for material less than 75mm in diameter, and 5m for material greater than 75mm in diameter or piles of debris. The use of harvesting machinery to assist with tops disposal within the poorly reserved forest ecosystem is not permitted.

8.3.4.2 Craftwood

The collection of craftwood is not permitted from poorly reserved forest ecosystem.

8.3.4.3 Firewood

Collection of domestic or commercial firewood is not permitted from poorly reserved forest ecosystem.

8.3.4.3 Log salvage

Conditions for the salvage of logs are outlined in Schedule 3 ï ñSalvage of logs in association with informal reservesò.

8.3.5 Recreation activities

8.3.5.1 Recreation sites

The ongoing use and maintenance of any existing recreation facilities in poorly reserved forest ecosystems will generally be continued and minor maintenance work may be approved by the District Manager. Any maintenance activity that requires the removal of trees, an expansion of the area of influence or permanent change to the understorey composition or structure on existing sites, must be referred to the Director, Sustainable Forest Management for approval.

New recreation site development and permanent infrastructure should not be planned for or approved in poorly reserved forest ecosystems.

Proposals affecting the boundary of a poorly reserved forest ecosystem will be assessed on a case-by-case basis, and require approval in writing from the Director, Sustainable Forest Management.

8.3.5.2 Tracks / trails

Schedule 4 ï ñManagement of Access in Informal Reserves and Other Protected Areas within State Forest and Timber Reservesò should be used as reference to determine the appropriate conditions for construction and maintenance work on tracks / trails in informal reserves.

The continued use of existing trails in a poorly reserved forest ecosystem will generally be permitted, and the District Manager may approve ongoing low level maintenance. Any maintenance activity which requires the removal of trees, an expansion of the area of influence or permanent change to the understorey composition or structure on existing sites, must be referred to the Director, Sustainable Forest Management and require approval in writing.

The construction of new permanent walk trails or boardwalks through a poorly reserved forest ecosystem will be considered using a risk-based approach, and require approval from the Director, Sustainable Forest Management.

8.3.5.3 Interpretation

Proposals for such disturbance will be assessed on a case-by-case basis, and in conjunction with the cumulative effect of the associated trails.

8.3.6 Access roads

In general, new road construction should not occur in poorly reserved forest ecosystems. Schedule 4 ï ñManagement of Access in Informal Reserves and Other Protected Areas within State Forest and Timber Reservesò should be used as reference to determine the appropriate conditions.

8.3.6.1 Existing roads

Existing well-formed roads may continue to be used through poorly reserved forest ecosystem. It is important that any maintenance works (maintenance grading, slashing of verges and maintenance of pipes, sumps and offshoot drains) are carried out in such a way that they protect the poorly reserved forest ecosystem values. The proponent should ensure that maintenance crews, machine operators and other contractors are closely supervised when working in these sensitive areas.

The relevant District Manager may approve all road maintenance works on the existing alignment, after the preparation of a detailed works prescription.

The decision to upgrade an existing track through any poorly reserved forest ecosystems should not be treated lightly, and it must be demonstrated to be more environmentally acceptable than other options. Where upgrading within poorly reserved forest ecosystem is contemplated the circumstances require assessment on a case-by-case basis and approval from the relevant Departmental Regional Manager.

8.3.6.2 New roads

Where new roading is necessary within a poorly reserved forest ecosystem the road should be located to minimise **both** the area of protectable, dieback free forest or poorly reserved forest ecosystem put at risk, and the risk of infesting the poorly reserved forest ecosystem. The proponent should identify the areas put at risk, disease vectors, and possible alternatives for consideration on a case-by-case basis and approval from the relevant Departmental Regional Manager.

Roads and trails are significant potential sources for the introduction of *Phytophthora* and the placement of new roading will impact long-term management of protectable areas. The placement of roads up-slope from poorly reserved forest ecosystem is to generally be avoided, particularly for roads to be used in all weather conditions, to minimise the risk of infesting the informal reserve.

Roads through a poorly reserved forest ecosystem will be constructed and maintained in a manner that minimises the environmental impact on the conservation and landscape values.

8.3.6.3 Disease implications

Where existing roads are up-slope from poorly reserved forest ecosystem and the ecosystem is protectable and dieback free, opportunities for the closure and rehabilitation should be sought, to minimise the risk of infesting the poorly reserved forest ecosystem.

8.3.6.4 Closure / rehabilitation

In all cases the decision regarding the continued use or closure of any road is the responsibility of DEC, and the decision to close the road should be made by a DEC authorized person before any action is taken in the field. Where existing roads are identified for closure, then the road will be closed and rehabilitated to the standard required by DEC.

Where roads or tracks are closed, it is important that the rehabilitation techniques are carefully considered, and that the type and extent of work does not increase the magnitude of the disturbance. Detailed prescriptions outlining the extent of machine activity and proposed earthworks are required. The proponent and Departmental staff will closely supervise these activities, and the completed works will be inspected and signed off by the District Manager to ensure that the prescribed standards are achieved.

8.3.7 Research and inventory

8.3.7.1 Research plots

Where research plots are currently located in areas of forest that have been classified as poorly reserved forest ecosystem, these plots may remain in use, and plot maintenance activity which does not require the removal of trees, an expansion of the area of influence or permanent change to the understorey composition may continue, following advice by the research scientist to the relevant District Manager.

In some cases such as silvicultural research plots, there may be the expectation for a silvicultural treatment to be applied to the area that may include falling of trees, notching, or significant disturbance to the understorey structure or composition. These proposals are inconsistent with the management objectives for poorly reserved forest ecosystems, and new research plots of this type should not be located in poorly reserved forest ecosystems.

Where an existing plot of this nature forms part of a long-term project or there are limited options for alternative areas then these may be approved. This will require the review of the Research Management Plan, and endorsement by the Manager DEC Science, and the relevant Regional Manager.

8.3.7.2 Inventory plots

Where inventory plots are currently located in areas of forest that have been classified as poorly reserved forest ecosystem, these plots may remain in use, and plot maintenance activity which does not require the removal of trees, an expansion of the area of influence or permanent change to the understorey composition may continue, following advice by the Manager, Forest Management Branch to the relevant District Manager.

Where plot maintenance is likely to require removal of standing trees, or major and periodic changes to the understorey structure (such as slashing of the understorey) then this will require the review of the Inventory purpose, and endorsement by the Manager, Forest Management Branch, and the relevant Regional Manager. New inventory plots of this nature should not be located in a poorly reserved forest ecosystem.

8.3.8 Public utilities

The siting of new permanent infrastructure associated with pubic utilities (such as powerlines, pipelines, roads or other easements) may occasionally be required in poorly reserved forest ecosystem or adjacent to them. The proximity of the proposed utility to the patch may be important especially in the case of powerlines, because of the need to profile fall trees in the adjoining forest for line security. Proposals for such new disturbance will be assessed on a case-by-case basis, and will need to be approved by the Minister for the Environment.

8.3.9 Basic raw materials

The extraction of basic raw materials is not permitted in poorly reserved forest ecosystems. Vehicles involved in extraction of basic raw material are not permitted to enter the poorly reserved forest ecosystems unless the approval of the relevant Regional Manager has been obtained.

Existing extraction sites in poorly reserved forest ecosystems should, where reasonable and practicable, be closed and rehabilitated.

8.3.10 Mining

For existing operations the arrangements for protection the values contained in informal reserves vary for each individual company, tenement and types of mine. Different arrangements often exist for the extensive exploration phase than for the intensive and highly disturbing infrastructure construction, mining, transport or processing phase.

The siting of mining or permanent infrastructure associated with mining may occasionally be proposed in or adjacent to a poorly reserved forest ecosystem or buffers that are not intended to be mined. Proposals for such disturbance will be assessed through an environmental impact assessment process under the Environmental Protection Act on a case-by-case basis, and will need to be approved by the Minister for the Environment.

For new operations, the Department will make submissions in relation to mining and petroleum proposals submitted to it for comments or advice which seek to reduce the impact of those proposals on poorly reserved forest ecosystems.

Schedule 5 outlines the process used by Alcoa Australia to manage proposed disturbances in CAR informal reserves within their tenement.

8.3.11 Public safety

A dangerous tree within the boundary of a poorly reserved forest ecosystem may be felled if it presents a safety hazard to workers in the area, or to the public, according to the following requirements:

- The proponent should request approval to fell trees in a poorly reserved forest ecosystem because of safety concerns, by providing a description of the tree, a map, and a photograph of the tree;
- The proponent must demonstrate that they have considered non-destructive methods to make the tree safe, as part of the request to fell the tree;
- The relevant Departmental Regional Manager should authorise in writing the felling of a dangerous tree prior to the work commencing;
- The tree must be tree-marked by a forest officer of the Department; and
- The relevant District office will retain a record of the decision.

8.4 Monitoring

The Department will periodically monitor compliance with the requirements for management of poorly reserved forest ecosystems, in accordance with the principles of the ñForest Monitoring Guidelineò. WIN / MLs will be used to monitor non-compliance with forest management requirement of the FMP or approved conditions for disturbance activities.

8.4.1 Audit

Management Audit Branch will periodically audit compliance with the requirements for management of poorly reserved forest ecosystems.

8.5 Management of poorly reserved forest ecosystem data

The authority to amend the poorly reserved forest ecosystem data is reserved for the Manager FMB, and no major changes can be made without authorization. The ñInformal Reserve Amendmentò form provides the record of the recommendation. These original forms are held and processed at FMB (Bentley).

8.5.1 Amending poorly reserved forest ecosystem data

For amendments to the boundary of mapped poorly reserved forest ecosystems, the following process is used:

- Inspect the mapped location in the field with the assistance of a person with experience in identifying and defining poorly reserved forest ecosystems;
- For variations complete and submit and ñInformal Reserve Amendmentò form showing the actual location of the boundary of the forest ecosystem;
- Regional staff will field check the variation and make a recommendation to Manager FMB;
- Following approval the new location of the forest ecosystems is corrected in the FMIS database; and
- A new base print is issued for use by the proponent.

8.5.1.1 Maps

Operational map products are developed incorporating the variation in location, but no specific poorly reserved forest ecosystem map is produced.

Initial mapping is done from hand-held GPS track files, which are completed by FMB staff.

Final location and verification of the poorly reserved forest ecosystems is done by FMB, following the disturbance, from GPS track files and aerial photography.

Where changes to the location or status of poorly reserved forest ecosystems have been identified then FMB **must issue an amended operational base plan** before operational planning can be finalised and the operational approval granted.

In cases where amendments affect harvest coupe boundaries, the relevant Regional Manager of the Department must approve proposed variations to the boundaries and locations of poorly reserved forest ecosystems in writing before any disturbance to these areas take place. An ñInformal Reserve Variationò form must be completed and submitted to the relevant Regional Manager for this purpose.

8.5.2 Records

The following records will be retained by FMB:

- ñInformal Reserve Amendmentò form; and
- Amended harvest coupe base plans or other operational base plan.

Data records in FMIS are subsequently amended by FMB to reflect the approved changes following digitization of map information.

8.5.3 Custodianship

The custodianship of the FMIS databases is assigned to the Manager, FMB.

9 RFA accredited linkage zones

9.1 Characteristics of RFA accredited linkage zones

9.1.1 Definition

The FMP defines a RFA accredited linkage zone as;
"The areas identified in the Department's corporate database that provide a link between the proposed Milyeanup National Park and an adjacent stream zone, and a corridor between the Helena and Flynn parts of the proposed Helena Valley National Park."

Their purpose is to provide a low disturbance linkage zones and they are to be identified and managed in the field as depicted in the FMP.

9.2 Planning and identification of RFA accredited linkage zones

Where disturbance operations are proposed it is necessary to ensure that the areas of mapped RFA accredited linkage zones are located and defined. During the planning of any disturbance operation base plans of the target area will be produced. These plans are developed directly from the Departmentôs corporate database. The plans show those areas of forest zoned in the approved forest management plan as a RFA accredited linkage zone. This will provide the first level of identification of a RFA accredited linkage zones for field operations staff.

9.2.1 Source information

9.2.1.1 FMP

The link between the Milyeanup National Park and an adjacent stream zone was first identified in the Deferred Forest Agreement (DFA) process, and has been retained in the subsequent RFA review. This reserve is classified as a CAR reserves according to clause 12 (b) of the RFA agreement (Appendix 1).

The corridor between the Helena and Flynn parts of the proposed Helena Valley National Park was first identified during the RFA process, and is also classified as a CAR reserves under clause 12 (b) of the RFA agreement.

9.2.2 Responsibilities

It is the responsibility of the proponent of any operation to identify the full extent of a RFA accredited linkage zones, to demarcate these in the field and protect them during their activities. There is no requirement for the proponent to field check for variations in the location of these zones.

9.3 Implementing and managing disturbance activities in RFA accredited linkage zones

There are a wide range of activities that are currently undertaken in RFA accredited linkage zone and that have the potential to disturb the values that the RFA accredited linkage zone exhibit. The level of risk that these present and the management requirements and options associated with them vary considerably. The management issues associated with these activities are outlined below. Where a manager cannot resolve the issue by using these Guidelines, or where the manager is unsure of the

consequences, then the proposal should be referred to a more senior officer for consideration and approval.

9.3.1 Demarcation

The boundary of the RFA accredited linkage zones will be marked in the field using the boundary indicated in the Departmentôs corporate database. Demarcation in conjunction with timber harvesting operations will be as defined for other informal reserves in the *"Contractors' Timber Harvesting Manual"*. This requires white crosses to be painted on trees, with the cross facing away from the RFA accredited linkage zone. The demarcation may any additional area that has been included for management convenience.

All RFA accredited linkage zones are to be identified and demarcation completed before operations commence.

9.3.2 Flora and fauna management activities

9.3.2.1 Apiary sites

Where apiary sites are currently located within RFA accredited linkage zones then they may continue to be used, providing that the apiarist does not create new tracks, damage standing trees or clear additional understorey. Apiary sites that are located in RFA accredited linkage zone will be periodically inspected to ensure that their continued use is not degrading RFA accredited linkage zone values. Existing apiary sites may be relocated out of RFA accredited linkage zones at the discretion of the relevant Regional Manager of the Department.

In general the Department will not relocate current apiary sites, or create new apiary sites within RFA accredited linkage zone. The FMP requires that proposals to locate an apiary site in an RFA accredited linkage zone will be assessed on a case-by-case basis and require the approval in writing of the relevant Regional Manager of the Department. Proponents will need to demonstrate that the proposal will not significantly impact on the values for which the RFA accredited linkage zone was established.

9.3.2.2 Wildflower harvesting

Wildflower harvesting should not be approved in a RFA accredited linkage zone.

9.3.2.3 Seed collection

Seed collection should not be approved in a RFA accredited linkage zone.

9.3.2.4 Predator and feral animal control

Existing predator and feral animal control activities such as baiting and trapping may be continued in RFA accredited linkage zone. The authority for approving the continuation of these activities is the Departmental District Manager or their delegated officer.

New predator and feral animal control activities which involve construction of tracks, traps or clearing of the understorey in RFA accredited linkage zones must be referred to Regional Managers for approval, prior to the work commencing.

9.3.2.5 Weed control

Existing weed control activities such as spraying or grubbing may be continued in RFA accredited linkage zone. The authority for approving the continuation of these activities is the Departmental District Manager or their delegated officer.

Where tree weeds have established in RFA accredited linkage zones, especially adjacent to plantations or exotic species plots, then these trees should be considered for removal in conjunction with the harvest of the plantation or plot. Where they can be felled and extracted without machine intrusion into the RFA accredited linkage zone, then commercial removal may be approved by the Regional Manager. Where the logs are not accessible without machine intrusion into the RFA accredited linkage zone, then the commercial removal of the trees may be approved on a case-by-case basis by the Director, Sustainable Forest Management.

New remedial treatment for weed control not involving machine entry may be considered and approved by the District Manager. New weed control activities that involve construction of tracks or clearing of the understorey in less well reserved vegetation complexes must be referred to Regional Managers for approval.

9.3.3 Fire management activities

The objectives for prescribed burning will be set taking into account the purpose and values sought to be protected in the burn. The burn prescription for an area that includes an RFA accredited linkage zone must identify the RFA accredited linkage zone and any other informal reserve and any special requirements with respect to prescribed burning. The burn objectives must take account of those special requirements.

9.3.3.1 Community protection burning

The inclusion of RFA accredited linkage zone in areas burnt by low intensity prescribed fire to meet community protection or biodiversity objectives is generally acceptable with no special precautions to be applied.

9.3.3.2 Biodiversity management burning

Biodiversity management burning using low intensity prescribed fire is generally acceptable with no special precautions to be applied. Where biodiversity management burning with high intensity fire is proposed this may be approved by the relevant Department Regional Manager providing it is clearly defined within the prescribed fire plan.

9.3.3.3 Wildfire management

Suppression

In the event of wildfire, the Incident Management Teams should ensure that the Situation Officer is aware of SFM requirements and check for protection of the values contained in the RFA accredited linkage zones. The protection of RFA accredited linkage zone must receive consideration; however, this must be taken in the context of broader environmental values and other values threatened by the fire. For example it is not sensible to protect RFA accredited linkage zone from fire, if this would require track construction with greater long-term environmental consequences or lead to higher value losses elsewhere.

Fire-line construction

Disturbance of RFA accredited linkage zone during wildfire suppression activities is to be avoided where possible, and the identification of RFA accredited linkage zone in wildfire suppression planning must take high priority.

Felling for burn security

The felling of burning trees for burn security reasons during fire suppression in RFA accredited linkage zone requires the approval of the Incident Controller. The approval should be recorded in the Incident Log.

Rehabilitation

Disturbance from fire-line construction, felling for burn security within RFA accredited linkage zone will be rehabilitated in the post-fire recovery process. Rehabilitation of fire-lines will be aimed at ameliorating erosion and compaction, minimising future erosion, restoring understorey cover and preventing future damage to trees by completing tops disposal. The particular requirements will be site specific and will be detailed in a Rehabilitation Plan for the incident.

All trees that have intersected with the fire-line will be considered for log salvage however the log should only be salvaged if it can be removed without further damage to standing trees within the informal reserve, and without the machine needing to leave the fireline. Log extraction along the centreline of the log is permitted as it should not increase damage within the informal reserve or create a new corridor of disturbance.

The rehabilitation work associated with trees felled for burn suppression, will be the cutting and stacking of tops and debris within 20 metres of the edge, tops disposal of trees and other works required for management of biodiversity and visual amelioration of the damage.

The use of harvesting machinery to assist with removal of the logs and stacking of tops is permitted. The use of harvesting machinery in the RFA accredited linkage zone may be appropriate due to rapid recovery of understorey following the burn. The use of such machines should comply with appropriate hygiene management protocols. Care should be taken to minimise the amount of soil that is moved in this operation, as this will affect the regeneration of understorey following the fire. Any decision to allow harvesting machinery or earthmoving equipment to enter an RFA accredited linkage zone to rehabilitate disturbance during an incident must be approved by the Incident Controller and recorded in the Incident Log.

9.3.3.4 Silvicultural burning

The inclusion of RFA accredited linkage zones in jarrah regeneration burning is to be avoided where practicable. This requirement is targeted at to increasing the short-term biodiversity benefits of retained vegetation undisturbed by harvesting. Where this is not practical, due to burn security or the need for excessive disturbance to keep fire out of the RFA accredited linkage zone, then prescribed burning of area is acceptable. This should be clearly defined within the prescribed fire plan for approval by the relevant Department Regional Manager.

Under no circumstances should the RFA accredited linkage zone be subjected to a high intensity silvicultural burn, without the written approval of the relevant Regional Manager.

9.3.3.5 Hazardous trees

It is important for DEC staff to manage public safety and burn security issues that are related to hazardous trees on public roads, facility developments and burn boundaries in the RFA accredited linkage zone prior to burning. Consideration of these issues at the early stage will enable the implementation of non-destructive techniques to manage these trees. The options for managing these trees are outlined in Schedule 2 ï ñManaging hazardous treesò.

9.3.3.6 Construction and maintenance of water points

The construction of new water points for fire suppression is not permitted in RFA accredited linkage zones.

The requirements for the maintenance of water point and its associated infrastructure will be as per Fire Operational Guideline No. 28- *"Water point construction and maintenance*ò or its replacement Fire Operations Guideline.

9.3.4 Timber harvesting activities

9.3.4.1 Timber harvesting

Timber harvesting is excluded from RFA accredited linkage zones and designated buffers, and harvesting machinery is prohibited from crossing the boundaries except for:

- removal of trees resulting from the clearing for an authorised road construction or upgrading; and
- removal of individual trees for safety reasons along public access roads, around recreation sites or adjacent to work sites.

A tree within the boundary of a RFA accredited linkage zone that presents a safety hazard to workers in the adjacent timber harvesting area may be felled, providing it has been tree-marked by a forest officer of the Department before it is felled. The relevant District office will retain a record of the decision.

Trees within the harvesting area should not be felled if they will fall into the RFA accredited linkage zone. In instances where the tree accidentally falls into an RFA accredited linkage zone, such trees may be salvaged according to the conditions outlined in Schedule 3 ï ñSalvage of logs in association with informal reservesò.

The faller is required to carry out manual cross cutting of crown material and manual tops disposal of crown material from the base of trees in the RFA accredited linkage zone to a distance of 1m for material less than 75mm in diameter, and 5m for material greater than 75mm in diameter or piles of debris. The use of harvesting machinery to assist with tops disposal within the RFA accredited linkage zones is not permitted.

9.3.4.2 Craftwood

The collection of craftwood is not permitted from RFA accredited linkage zone.

9.3.4.3 Firewood

Collection of domestic or commercial firewood is not permitted from RFA accredited linkage zone.

9.3.4.3 Salvage of logs

Conditions for the salvage of logs are outlined in Schedule 3 ï ñSalvage of logs in association with informal reservesò.

9.3.5 Recreation activities

9.3.5.1 Recreation sites

The ongoing use and maintenance of any existing recreation facilities in RFA accredited linkage zones will generally be continued and minor maintenance work may be approved by the District Manager. Any maintenance activity that requires the removal of trees, an expansion of the area of influence or permanent change to the understorey composition or structure on existing sites, must be referred to the Director, Sustainable Forest Management for approval.

New recreation site development and permanent infrastructure should not be planned for or approved in RFA accredited linkage zones.

Proposals affecting the boundary of a RFA accredited linkage zone will be assessed on a case-by-case basis, and require approval in writing from the Director, Sustainable Forest Management.

9.3.5.2 Tracks / trails

Schedule 4 ï ñManagement of Access in Informal Reserves and Other Protected Areas within State Forest and Timber Reservesò should be used as reference to determine the appropriate conditions for construction and maintenance work on tracks / trails in informal reserves.

The continued use of existing trails in RFA accredited linkage zone will generally be permitted, and the District Manager may approve ongoing low level maintenance. Any maintenance activity which requires the removal of trees, an expansion of the area of influence or permanent change to the understorey composition or structure on existing sites, must be referred to the Director, Sustainable Forest Management and require approval in writing.

The construction of new permanent walk trails or boardwalks through RFA accredited linkage zone will be considered using a risk-based approach, and require approval from the Director, Sustainable Forest Management.

9.3.5.3 Interpretation

The installation of new permanent infrastructure associated with interpretation will not generally be supported if it will affect the core of the patch, but may be acceptable on the boundary of the patch or in the buffer. Proposals for such disturbance will be assessed on a case-by-case basis, and in conjunction with the cumulative effect of the associated trails.

9.3.6 Access roads

In general, new road construction is prohibited in RFA accredited linkage zones. However, in some cases new roading is necessary, for example where stream crossings are required in timber harvesting operations or when the upgrade of an existing track through an informal reserve may be more environmentally acceptable than other options. Where road construction or upgrading within an informal reserve is contemplated the circumstances require assessment on a case-by-case basis and written approval from the relevant Departmental Regional Manager. Schedule 4 ï ñManagement of Access in Informal Reserves and Other Protected Areas within State Forest and Timber Reservesò should be used as reference to determine the appropriate conditions.

9.3.6.1 Existing roads

Existing well-formed roads t may continue to be used through RFA accredited linkage zones. It is important that any maintenance works (maintenance grading, slashing of verges and maintenance of pipes, sumps and offshoot drains) are carried out in such a way that they protect the RFA accredited linkage zone values. The proponent should ensure that maintenance crews, machine operators and other contractors are closely supervised when working in these sensitive areas.

The relevant District Manager may approve all road maintenance works on the existing alignment, after the preparation of a detailed works prescription.

The decision to upgrade an existing track through a RFA accredited linkage zone should not be treated lightly, and it must be demonstrated to be more environmentally acceptable than other options. Where upgrading within RFA accredited linkage zone is contemplated the circumstances require assessment on a case-by-case basis and approval from the relevant Departmental Regional Manager.

9.3.6.2 New roads

Where new roading is necessary within a RFA accredited linkage zone the road should be located to minimise **both** the area of protectable, dieback free forest or RFA accredited linkage zone put at risk, and the risk of infesting the RFA accredited linkage zone. The proponent should identify the areas and vectors, and possible alternatives for consideration on a case-by-case basis and approval from the relevant Departmental Regional Manager.

Roads and trails are significant potential sources for the introduction of *Phytophthora* and the placement of new roading will impact long-term management of protectable areas. The placement of roads up-slope from RFA accredited linkage zone is to generally be avoided, particularly for roads to be used in all weather conditions, to minimise the risk of infesting the informal reserve.

Roads through RFA accredited linkage zone will be constructed and maintained in a manner that minimises the environmental impact on the conservation and landscape values.

9.3.6.3 Disease implications

Where existing roads are up-slope from RFA accredited linkage zone and the zone is protectable and dieback free, opportunities for the closure and rehabilitation should be sought, to minimise the risk of infesting the RFA accredited linkage zone.

9.3.6.4 Closure / rehabilitation

In all cases the decision regarding the continued use or closure of any road is the responsibility of DEC, and the decision to close the road should be made by a DEC authorized person before any action is taken in the field. Where existing roads are identified for closure, then the road will be closed and rehabilitated to the standard required by DEC.

Where roads or tracks are closed, it is important that the rehabilitation techniques are carefully considered, and that the type and extent of work does not increase the magnitude of the disturbance. Detailed prescriptions outlining the extent of machine activity and proposed earthworks are required. The proponent and Departmental staff will closely supervise these activities, and the completed works will be inspected and signed off by the District Manager to ensure that the prescribed standards are achieved.

9.3.7 Research and inventory

9.3.7.1 Research plots

If research plots are located in RFA accredited linkage zone then plots based on low key monitoring, or observation, which will not result in the changes to the level of disturbance, may remain in use. Plot maintenance activity which does not require the removal of trees, an expansion of the area of influence or permanent change to the understorey composition may continue, following advice by the research scientist to the relevant District Manager.

In some cases such as silvicultural research plots, there may be the expectation for a silvicultural treatment to be applied to the area that may include falling of trees, notching, or significant disturbance to the understorey structure or composition. These proposals are inconsistent with the management objectives for RFA accredited linkage zones, and new research plots of this type should not be located in RFA accredited linkage zones.

Where an existing plot of this nature forms part of a long-term project or there are limited options for alternative areas then these may be approved. This will require the review of the Research Management Plan, and endorsement by the Manager DEC Science, and the relevant Regional Manager.

9.3.7.2 Inventory plots

If inventory plots are located in RFA accredited linkage zones then those plots based on low key monitoring, or observation, which will not result in the changes to the level of disturbance, may remain in use. Plot maintenance activity which does not require the removal of trees, an expansion of the area of influence or permanent change to the understorey composition may continue, following advice by the Manager, Forest Management Branch to the relevant District Manager.

Where plot maintenance requires removal of standing trees, or major and periodic changes to the understorey structure (such as slashing of the understorey) then this will require the review of the Inventory purpose, and endorsement by the Manager, Forest Management Branch, and the relevant Regional Manager. New inventory plots of this nature should not be located in a RFA accredited linkage zone.

9.3.8 Public utilities

The siting of new permanent infrastructure associated with pubic utilities (such as powerlines, pipelines, roads or other easements) may occasionally be required in RFA accredited linkage zones or adjacent to them. The proximity of the proposed utility to the zone may be important especially in the case of powerlines, because of the need to profile fall trees in the adjoining forest for line security. Proposals for such new disturbance will be assessed on a case-by-case basis, and will need to be approved by the Minister for the Environment.

9.3.9 Basic raw materials

The extraction of basic raw materials is not permitted in RFA accredited linkage zones. Vehicles involved in extraction of basic raw material are not permitted to enter the RFA accredited linkage zone unless the approval of the relevant Regional Manager has been obtained.

Existing extraction sites in RFA accredited linkage zone should, where reasonable and practicable, be closed and rehabilitated.

9.3.10 Mining

For existing operations the arrangements for protection the values contained in informal reserves vary for each individual company, tenement and types of mine. Different arrangements often exist for the extensive exploration phase than for the intensive and highly disturbing infrastructure construction, mining, transport or processing phase.

The siting of mining or permanent infrastructure associated with mining may occasionally be proposed in or adjacent to RFA accredited linkage zone or buffers that are not intended to be mined. Proposals for such disturbance will be assessed on a case-by-case basis, and will need to be approved by the Minister for the Environment.

For new operations, the Department will make submissions in relation to mining and petroleum proposals submitted to it for comments or advice which seek to reduce the impact of those proposals on RFA accredited linkage zones.

Schedule 5 outlines the process used by Alcoa Australia to manage proposed disturbances in CAR informal reserves within their tenement.

9.3.11 Public safety

A dangerous tree within the boundary of a RFA accredited linkage zone may be felled if it presents a safety hazard to workers in the area, or to the public, according to the following requirements:

- The proponent should request approval to fell trees in a RFA accredited linkage zone because of safety concerns, by providing a description of the tree, a map, and a photograph of the tree;
- The proponent must demonstrate that they have considered non-destructive methods to make the tree safe, as part of the request to fell the tree;
- The relevant Departmental Regional Manager should authorise in writing the felling of a dangerous tree prior to the work commencing;
- The tree must be tree-marked by a forest officer of the Department, and
- The relevant District office will retain a record of the decision.

9.4 Monitoring

The Department will periodically monitor compliance with the requirements for management of RFA accredited linkage zones, in accordance with the principles of the ñForest Monitoring Guidelineò. WIN / MLs will be used to monitor non-compliance with forest management requirement of the FMP or approved conditions for disturbance activities.

9.4.1 Audit

Management Audit Branch will periodically audit compliance with the requirements for management of RFA accredited linkage zones.

9.5 Management of RFA accredited linkage zone data

The location of RFA accredited linkage zones was established in the RFA and there is no intention to alter this dataset.

9.5.1 Amending RFA accredited linkage zone data

There is no scope or requirement to amend the data with respect to this informal reserve type.

9.5.2 Custodianship

The custodianship of the FMIS databases is assigned to the Manager, FMB.

9.5.3 Mandatory actions for reviewing and managing RFA accredited linkage zones data

There are no identified mandatory actions for managing data for this informal reserve type.

10 Fauna habitat zones

10.1 Purpose of fauna habitat zones

The principal purpose of fauna habitat zones (FHZ) is to provide a strategy to meet the objectives of the FMP in ensuring that biodiversity recovers between one timber harvesting rotation and the next. The zones fulfil this purpose by providing a sufficiently extensive network of areas excluded from timber harvesting in the mid-term within State forest and timber reserves. The design of the network of zones therefore applies at the landscape scale, with implementation then occurring at the forest block and coupe scales. The zones are intended to maintain both fauna populations within themselves, and to provide a source for the re-colonisation of nearby areas after timber harvesting. FHZs are not classified as informal reserves and they may not remain in the same location in perpetuity. It is intended that they are shifted across the forest landscape over time as regrowth areas develop and assume mature forest characteristics.

FHZ may contain a number of informal reserves and areas outside the informal reserves that would otherwise be available for timber production. In all cases the informal reserves contained within the FHZ will be managed according to conditions outlined in the preceding sections of this document for each type of informal reserve. The area outside the informal reserves will be managed according to the following criteria.

10.2 Planning in relation to fauna habitat zones

Where disturbance operations are proposed it is necessary to ensure that the areas of mapped FHZ are located and defined. During the planning of any disturbance operation, base plans of the target area will be produced. These plans are developed directly from the Departmentôs corporate database. The plans show those areas of forest zoned in the approved forest management plan as a FHZ. This will provide the first level of identification of a FHZ for field operations staff.

The following categories of FHZ need to be addressed:

Indicative - A zone located during the development of the FMP, which constitutes part of the underlying area settings, and is subject to refinement of their final location through the application of these Guidelines. These zones were located during an overall forest-wide design analysis for the FMP, with some subsequent adjustments and refinements.

Recommended - A zone that has been located according to the design criteria in the selection guideline, and for which the recommended location has been forwarded to the Director of SFM for consideration. This is a transient stage in the design process for areas awaiting consideration / approval.

Final - A zone whose final location has been approved and whose status has been recorded as final in the Departmentôs corporate database.

Final (Interim) - A zone whose final location has been approved / determined for all purposes **except mining**, and whose interim status has been recorded in the Departmentôs corporate database. The final location of zones within a State Agreement Act mining lease area are subject to State consultation with relevant companies using

processes prescribed under, and consistent with, rights under the relevant Agreement Act.

Planning activities associated with preparation of a pre-operations checklist for the identification of forest values may be carried out in an Indicative FHZ, prior to approval of a disturbance operation such as roading and harvesting. This may include all or some of the following activities:

- dieback interpretation;
- flora survey;
- silvicultural survey (pre-harvest regeneration survey, seed forecast, basal area assessment etc.);
- road planning and selection (including blade-up access in forest with impeded access);
- demarcation of informal reserves; and
- treemarking.

The approval by the District Manager for the proponent to undertake this work does not constitute a confirmation that the area will be available for subsequent disturbance.

10.2.1. Responsibilities

It is the responsibility of the proponent of any operation to identify FHZ, demarcate them in the field and protect to them during their activities. There is no requirement for the proponent to field check for variations in the location of the FHZ.

10.3 Implementation of disturbance activities in fauna habitat zones

The FMP states ñWhere reasonable and practicable, the Department and Forest Products Commission will seek to avoid the location of new roads or the clearing of significant areas of native vegetation in indicative FHZ. Otherwise, no special provisions will apply to indicative fauna habitat zonesò.

In assessing operations against these criteria the following interpretations will be used:

- Location of new roads ï will include road upgrading involving widening of roads with limited removal of trees, as well as new construction (refer to ó SFM Advisory Note No. 3 ï Management of Access in Informal Reserves and Other Protected Areas Within State Forest and Timber Reservesò for descriptions of the work components);
- Clearing of significant areas of native vegetation ï the threshold will be areas Ó0.1ha;
- Clearing of significant areas of native vegetation will **not** include understorey management activities such as scrub-rolling for burn boundary preparation or slashing for road visibility that are part of an approved operational prescription; or
- Any proposal which involves disturbance that exceeds these limits will trigger the review of the Indicative FHZ, and require the finalisation of the FHZ location before the disturbance can proceed.

All activities that do not require tracks or clearing of vegetation may be approved according to normal Departmental procedures.

For FHZ the provisions for disturbance activities are outlined below. The provisions will apply to all categories of FHZ unless specifically stated otherwise.

10.3.1 Demarcation

The boundary of the FHZ will be marked in the field using the boundary indicated in the Departmentôs corporate database. Demarcation in conjunction with timber harvesting operations will be as defined for other informal reserves in the ñ*Contractors' Timber Harvesting Manual*ò. This requires white crosses to be painted on trees, with the cross facing away from the FHZ.

Demarcation of the FHZ boundary that is contiguous with a proposed disturbance is to be completed before operation commences.

10.3.2 Flora and fauna management activities

10.3.2.1 Apiary sites

Where apiary sites are currently located within FHZ then they may continue to be used, providing that the apiarist does not create new tracks, damage standing trees or clear additional understorey.

New apiary sites should not be created in, and existing sites should not be relocated into FHZ.

10.3.2.2 Wildflower harvesting

Wildflower harvesting may be permitted in FHZ. The Departmental District Manager may provide endorsement of the pickers licence for specific species and areas in which wildflower harvesting may occur. For Final and Final (interim) this endorsement will be only for the limited number of wildflower species that have been listed by the Department for harvest in stream zones or diverse ecotype zones.

Where approved, the activity of pickers in these areas will be monitored to ensure that picking does not lead to unnecessary disturbance of the values of the Final and Final (Interim) FHZ. Where there are signs of inappropriate harvesting technique, or excessive disturbance, the District Manager or their delegated officer will discuss the situation with the endorsed picker. If the inappropriate harvesting or disturbance continues then the District Manager will withdraw endorsement for the picker to harvest wildflowers in the FHZ for one or any of the species being picked.

10.3.2.3 Seed collection

Seed collection may be endorsed in FHZ by the Departmental District Manager or their delegated officer, as outlined above for wildflower harvesting.

10.3.2.4 Predator and feral animal control

Existing predator and feral animal control activities such as baiting and trapping may continue in FHZ.

New predator and feral animal control activities which involve construction of tracks or permanent clearing of the more than 0.1ha of understorey in FHZ must be approved by the referred to District Manager for approval, prior to the work commencing.

10.3.2.5 Weed control

Existing weed control activities such as spraying or grubbing may continue in FHZ. New remedial treatment for weed control not involving machine entry and new weed control activities that involve construction of tracks or clearing of >0.1 ha of understorey in FHZ must be referred to the relevant District Manager for approval.

Where tree weeds have established in FHZ, then these trees may be removed. When harvesting is proposed for an adjacent native forest coupe, plantation or exotic species plot, then the removal of the trees weeds should be considered in conjunction with the adjoining harvest. Where the tree weeds can be felled and extracted without machine intrusion into the FHZ, the non-commercial or commercial

removal of the trees may be approved by the Regional Manager. For wider reserves, where the tree weeds are not accessible without machine intrusion into the FHZ, the non-commercial or commercial removal of the trees may be approved on a case-by-case basis by the Director, Sustainable Forest Management.

10.3.3 Fire management activities

The conditions associated with fire management in FHZ are outlined below.

10.3.3.1 Community protection burning

The inclusion of FHZ in areas burnt by low intensity prescribed fire to meet community protection or biodiversity objectives is generally acceptable with no special precautions to be applied.

10.3.3.2 Biodiversity management burning

Biodiversity management burning using low intensity prescribed fire is acceptable with no special precautions to be applied. Where biodiversity management burning with high intensity fire is proposed in FHZ this may be approved by the relevant Department Regional Manager providing it is clearly defined within the prescribed fire plan.

10.3.3.3 Wildfire management

Suppression

In the event of wildfire, the Incident Management Teams should ensure that the Situation Officer is aware of SFM requirements and check for protection of the values contained in the FHZ. The protection of FHZ must receive consideration; however, this must be taken in the context of broader environmental values and other values threatened by the fire. For example it is not sensible to protect FHZ from fire, if this would require track construction with greater long-term environmental consequences or lead to higher value losses elsewhere.

Fire-line Construction

Disturbance of FHZ during wildfire suppression activities is to be avoided where possible, and the identification of FHZ in wildfire suppression planning must take high priority.

Felling for Burn Security

The felling of burning trees for burn security reasons during fire suppression in Final and Final (Interim) FHZ requires the approval of the Incident Controller. The approval should be recorded in the Incident Log.

Rehabilitation

Disturbance from fire-line construction, felling for burn security within FHZ will be rehabilitated in the post-fire recovery process. Rehabilitation of fire-lines will be aimed at ameliorating erosion and compaction, minimising future erosion, restoring understorey cover and preventing future damage to trees by completing tops disposal. The particular requirements will be site specific and will be detailed in a Rehabilitation Plan for the incident.

All trees that have intersected with the fire-line will be considered for log salvage however the log should only be salvaged if it can be removed without further damage to standing trees within the FHZ, and without the machine needing to leave the fire-line. Log extraction along the centreline of the log is permitted as it should not increase damage within the informal reserve or create a new corridor of disturbance.

The rehabilitation work associated with trees felled for burn suppression, will be the cutting and stacking of tops and debris within 20 metres of the edge, tops disposal of trees and other works required for management of biodiversity and visual amelioration of the damage.

The use of harvesting machinery to assist with removal of the logs and stacking of tops is permitted. The use of harvesting machinery in the FHZ may be appropriate due to rapid recovery of understorey following the burn. The use of such machines should comply with appropriate hygiene management protocols. Care should be taken to minimise the amount of soil that is moved in this operation, as this will affect the regeneration of understorey following the fire. Any decision to allow harvesting machinery or earthmoving equipment to enter an FHZ to rehabilitate disturbance during an incident must be approved by the Incident Controller and recorded in the Incident Log.

10.3.3.4 Silvicultural burning

The inclusion of FHZ in both jarrah and karri regeneration burning is to be avoided where practicable and under no circumstances should the FHZ be subjected to a high intensity silvicultural burn, without the written approval of the relevant Regional Manager. This requirement is targeted at increasing the short-term biodiversity benefits of retained vegetation undisturbed by harvesting. Where this is not practical, due to burn security or the need for excessive disturbance to keep fire out of the FHZ, then prescribed burning of area is acceptable. This should be clearly defined within the prescribed fire plan for approval by the relevant Department Regional Manager.

10.3.3.5 Managing hazardous trees

It is important for DEC staff to manage public safety and burn security issues that are related to hazardous trees on public roads, facility developments and burn boundaries in the FHZ prior to burning. Consideration of these issues at the early stage will enable the implementation of non-destructive techniques to manage these trees. The options for managing these trees are outlined in Schedule 2 ï ñManaging hazardous treesò.

10.3.3.6 Construction and maintenance of water points

The construction and maintenance of water points for fire suppression is permitted. The requirements for the water point and its associated infrastructure will be as per Fire Operational Guideline No. 28-ñ*Water point construction and maintenance*ò or its replacement Fire Operations Guideline.

10.3.4 Timber harvesting activities

10.3.4.1 Timber harvesting

Timber harvesting is excluded from FHZ, and harvesting machinery is prohibited from crossing the boundaries except for:

- removal of trees resulting from the clearing for an authorised road construction or upgrading;
- removal of individual trees for safety reasons along public access roads, around recreation sites or adjacent to work sites; and
- removal of trees following a natural event (such as a mini-tornado or cyclone) in an approved salvage operation.

The location of those FHZ that intersect or are encompassed by a proposed harvest coupe should be defined according to the requirements of the *"Guideline for the Selection of Fauna Habitat Zones*ò.

A tree within the boundary of a Final and Final (Interim) FHZ zone that presents a safety hazard to workers in the adjacent timber harvesting area may be felled, providing it has been tree-marked by a forest officer of the Department before it is felled. The relevant District office will retain a record of the decision.

Trees within the harvesting area should not be felled if they will fall into the FHZ. In instances where the tree accidentally falls into an FHZ, such trees may be salvaged according to the conditions outlined in Schedule 3 ï ñSalvage of logs in association with informal reservesò.

The faller is required to carry out manual cross cutting of crown material and manual tops disposal of crown material from the base of trees in the FHZ to a distance of 1m for material less than 75mm in diameter, and 5m for material greater than 75mm in diameter or piles of debris. The use of harvesting machinery to assist with tops disposal within the informal reserve is not permitted.

10.3.4.2 Craftwood

The collection of craftwood is not permitted from FHZ.

10.3.4.3 Firewood

Collection of domestic or commercial firewood is not permitted from FHZ.

10.3.4.4 Salvage of logs

Conditions for the salvage of logs are outlined in Schedule 3 ï ñSalvage of logs in association with informal reservesò.

10.3.5 Recreation activities

10.3.5.1 Recreation sites

The ongoing use and maintenance of existing recreation sites and facilities will be continued in FHZ, and work may be approved by the District Manager. Any maintenance activity that requires the removal of trees, an expansion of the area of influence or permanent change to the understorey composition or structure Ó 0.1ha on existing sites, must be referred to the relevant Regional Manager for approval.

The siting new recreation site development in FHZ should be avoided. Proposals for such disturbance will be assessed on a case-by-case basis, and require approval in writing from the Director, Sustainable Forest Management.

10.3.5.2 Tracks / trails

The continued use of existing trails in FHZ will be permitted, and the District Manager may approve ongoing low level maintenance. Any maintenance activity which requires the removal of trees, an expansion of the area of influence or permanent change to the understorey composition or structure on existing sites, must be referred to the Director, Sustainable Forest Management and require approval in writing.

The construction of new permanent walk trails or boardwalks through FHZ will be considered using a risk-based approach, and require approval from the Director, Sustainable Forest Management.

10.3.5.3 Interpretation

The installation of new permanent infrastructure associated with interpretation will not generally be supported within a FHZ but may be acceptable on the boundary of the zone. Proposals for such disturbance will be assessed on a case-by-case basis, and in conjunction with the cumulative effect of the associated trails.

10.3.6 Access roads

In general, new road construction should not occur in FHZ. However, in some cases new roading is necessary, for example where stream crossings are required in timber harvesting operations or when the upgrade of an existing track through an FHZ may be more environmentally acceptable than other options. Where road construction or upgrading within a FHZ is contemplated the circumstances require assessment on a case-by-case basis and written approval from the relevant Departmental Regional Manager. Schedule 4 ï ñManagement of Access in Informal Reserves and Other Protected

Areas within State Forest and Timber Reservesò should be used as reference to determine the appropriate conditions.

10.3.6.1 Existing roads

Existing well-formed roads may continue to be through FHZ. It is important that any maintenance works (maintenance grading, slashing of verges and maintenance of pipes, sumps and offshoot drains) are carried out in such a way that they protect the FHZ values. The proponent should ensure that maintenance crews, machine operators and other contractors are closely supervised when working in these sensitive areas.

The relevant District Manager may approve all road maintenance works on the existing alignment, after the preparation of a detailed works prescription.

The decision to upgrade an existing track through any informal reserve should not be treated lightly, and it must be demonstrated to be more environmentally acceptable than other options. Where upgrading within FHZ is contemplated the circumstances require assessment on a case-by-case basis and approval from the relevant Departmental Regional Manager.

10.3.6.2 New roads

The construction of new roads in FHZ should be avoided. Where new roading is necessary within a FHZ the road should be located to minimise **both** the area of protectable, dieback free forest or FHZ put at risk, and the risk of infesting the FHZ. The proponent should identify the areas and vectors, and possible alternatives for consideration on a case-by-case basis and approval from the relevant Departmental Regional Manager.

Roads through FHZ will be constructed and maintained in a manner that minimises the environmental impact on the conservation and landscape values.

10.3.6.3 Disease implications

Where existing roads are up-slope from a Final and Final (Interim) FHZ which is protectable and dieback-free, opportunities for the closure and rehabilitation should be sought, to minimise the risk of infesting the FHZ.

10.3.6.4 Closure / rehabilitation

In all cases the decision regarding the continued use or closure of any road is the responsibility of DEC, and the decision to close the road should be made by a DEC authorized person before any action is taken in the field. Where existing roads are identified for closure, then the road will be closed and rehabilitated to the standard required by DEC.

Where roads or tracks are closed, it is important that the rehabilitation techniques are carefully considered, and that the type and extent of work does not increase the magnitude of the disturbance. Detailed prescriptions outlining the extent of machine activity and proposed earthworks are required. The proponent and Departmental staff will closely supervise these activities, and the completed works will be inspected and signed off by the District Manager to ensure that the prescribed standards are achieved.

10.3.7 Research and inventory

10.3.7.1 Research plots

Where research plots based on low key monitoring, or observation, which will not result in the changes to the level of disturbance are located in areas of forest that have been classified as FHZ they may remain in use. Plot maintenance activity which does not require the removal of trees, an expansion of the area of influence or permanent change to the understorey composition may continue, following advice by the research scientist to the relevant District Manager.

In some cases such as silvicultural research plots, there may be the expectation for a silvicultural treatment to be applied to the area that may include falling of trees, notching, or significant disturbance to the understorey structure or composition. These proposals are inconsistent with the management objectives for a FHZ, and new research plots of this type should not be located in a FHZ.

Where an existing plot of this nature forms part of a long-term project or there are limited options for alternative areas then these may be approved. This will require the review of the Research Management Plan, and endorsement by the Manager DEC Science, and the relevant Regional Manager.

10.3.7.2 Inventory plots

Where inventory plots are currently located in FHZ, they may remain in use if the inventory is based on low key monitoring, or observation, which will not result in the changes to the level of disturbance. Plot maintenance activity which does not require the removal of trees, an expansion of the area of influence or permanent change to the understorey composition may continue, following advice by the Manager, Forest Management Branch to the relevant District Manager.

Where plot maintenance requires removal of standing trees, or major and periodic changes to the understorey structure (such as slashing of the understorey) then this will require the review of the Inventory purpose, and endorsement by the Manager, Forest Management Branch, and the relevant Regional Manager. New inventory plots of this nature should not be located in a FHZ.

10.3.8 Public utilities

The siting of new permanent infrastructure associated with pubic utilities (such as powerlines, pipelines, roads or other easements) may occasionally be required in FHZ or adjacent to them. The proximity of the proposed utility to the FHZ may be important especially in the case of powerlines, because of the need to profile fall trees in the adjoining forest for line security. Proposals for such new disturbance will be assessed on a case-by-case basis, and will need to be approved by the Minister for the Environment.

10.3.9 Basic raw materials

The extraction of basic raw materials for DEC use will not be permitted in FHZ.

10.3.10 Mining

Mineral and other exploration may be approved by the Regional Manager in areas of FHZ that do not have an overlaying informal reserves status. For existing operations the arrangements for protection the values contained in informal reserves vary for each individual company, tenement and type of mine. Different arrangements often exist for the extensive exploration phase than for the intensive and highly disturbing infrastructure construction, mining, transport or processing phase

Final (interim) FHZ may be considered for mining, or relocation to facilitate mining or mine infrastructure establishment according to the rights under the relevant State Agreement Act.

For new operations, the Department will make submissions in relation to mining and petroleum proposals submitted to it for comments or advice which seek to reduce the impact of those proposals on FHZ. Proposals for such disturbance will be assessed on a case-by-case basis, and will need to be approved by the Minister for the Environment.

10.3.11 Public safety

A dangerous tree within the boundary of a FHZ may be felled if it presents a safety hazard to workers in the area, or to the public, according to the following requirements:

- The proponent should request approval to fell trees in a FHZ because of safety concerns, by providing a description of the tree, a map, and a photograph of the tree;
- The proponent must demonstrate that they have considered non-destructive methods to make the tree safe, as part of the request to fell the tree;
- The relevant Departmental Regional Manager should authorise in writing the felling of a dangerous tree prior to the work commencing;
- The tree must be tree-marked by a forest officer of the Department; and
- The relevant District office will retain a record of the decision.

10.4 Monitoring

The Department will periodically monitor compliance with the requirements for management of FHZ, in accordance with the principles of the ñForest Monitoring Guidelineò. WIN / MLs will be used to monitor non-compliance with forest management requirement of the FMP or approved conditions for disturbance activities.

10.4.1 Audit

Management Audit Branch will periodically audit compliance with the requirements for management of FHZ.

10.5 Management of fauna habitat zone data

When the shape or location of a final FHZ needs to be amended then the contributing data must be amended. This will require the following issues to be addressed.

10.5.1 Amending FHZ data

The decision to amend the boundary of final FHZ. The following process is used;

- inspect the mapped location in the field;
- for variations complete and submit and ñInformal Reserve Amendmentò form showing the actual location of the FHZ;
- regional staff will field check the variation and make a recommendation to Manager FMB;
- following approval, the new location of the FHZ is corrected in the ñStream Bufferò database and FMIS database;
- a new base print is issued for use by the proponent; and
- the proponent must manage the operation outside the new boundary.

10.5.1.1 Maps

Operational map products are developed incorporating the variation in location, but no specific FHZ map is produced.

Initial mapping is done from hand-held GPS track files, which are completed by FMB staff.

Final location and verification of the FHZ is done by FMB, following the disturbance, from aerial photography.

Where changes to the location or status of FHZ have been identified then FMB **must issue an amended harvest coupe base plan** before operational planning can be finalised and the operational approval granted.

10.5.2 Records

The following records will be retained by FMB;

- ñInformal Reserve Amendmentò form;
- Amended harvest coupe base plans.

Data records in the ñFHZò database and FMIS are subsequently amended by FMB to reflect the approved changes following digitization of map information. These contributing datasets will continue to be refined and routinely updated on an annual basis. There will be periodic amendment to the data held by IMB to reflect major changes to the FHZ theme.

10.5.3 Custodianship

There will be periodic amendment to the contributing datasets to reflect major changes to the FHZ theme.

11 Attachments and schedules

Attachment A CAR Reserves

(Excerpt from "Regional Forest Agreement for the South-West Forest Region of Western Australia" (May 1999) - Attachment 1 (page 53-54).)

2. CAR Informal Reserves

State forest areas

10. CAR Informal Reserves in State forest total 137,886 hectares and are identified on Map 1. These CAR Informal Reserves have been identified as indicative areas printed at a map scale of 1:25,000 and held as an electronic layer.

11. Areas of land adjoining informal reserves that were accredited by the Commonwealth Scientific Advisory Group for the Deferred Forest Agreement will be designated as informal reserves by Western Australia.

12. The Parties have agreed that CAR informal reserves are the following component of the informal reserve system:

    (a) Stream reserves of a width equal to or greater than 150 metres;

    (b) Those informal reserves and adjoining areas of land that were accredited by the Commonwealth Scientific Advisory Group for the Deferred Forest Agreement;

    (c) Diverse ecosystem zones of an area equal to or greater than 40 hectares;

    (d) 400 m wide travel route reserves in the area containing Karri Yellow Tingle ecosystem; and

    (e) The Bibbulmun Track travel route reserve (400 m wide).

13. The Parties have accredited these informal reserves as CAR informal reserves on the basis that they are set aside specifically for conservation purposes and meet the principles established in the JANIS Reserve Criteria.

14. CAR Informal Reserves in State forest will be recognised in future Forest Management Plans.

15. The Department of Conservation and Land Management will identify CAR Informal Reserves on State forest on operational and planning maps and manage the areas for the identified values.

16. The State will finalise boundaries on 1:25,000 maps. Finalisation will consider field verification of values being protected, and appropriate boundaries mapped to protect the identified values.

17. The boundaries to CAR Informal Reserves in State forest may be reviewed and amended by the Department of Conservation and Land Management in the following circumstances:

Circumstance 1. Field inspection or improved mapping indicates that amendments are required create practical management boundaries or to more accurately reflect the location of the value.

Circumstance 2. The area does not contain the values for which it was identified.

Circumstance 3. Existing boundaries are found to place unreasonable restrictions on the practical access to areas outside the CAR Reserve system for forest-based industry or for infrastructure development

19. Amendments to the boundaries of CAR Informal Reserves in State forest will be assesses by the Department of Conservation and Land Management according to whether they:

Condition 1. Comply with clauses 67 and 72 of this Agreement.
Condition 2. Use best endeavours to maintain the levels of protection of National Estate values in a regional context.
Condition 3. Maintain a widely- distributed, inter-connected network of protected areas.
Condition 4. Maintain the Sustained Yield of areas available for timber harvesting in terms of volume, species and quantity.
Condition 5. Optimise the inclusion of areas that are unavailable for timber harvesting due to other considerations such as slope, access and site quality.
Condition 6. Avoid conflict with strategic burning zones.

20. Changes to CAR Informal Reserves in State forest will be reported in relation to the circumstances and conditions in clauses 17 and 18 above and included in the five-yearly reviews / reports on performance.

21. CAR Informal Reserves will be managed according to the principles established in the Forest Management Plan 1994-2003 for ñManaging Area of Special Significanceò and ñCode of Practice for Timber Harvesting in Western Australiaò and timber harvesting will be excluded from all CAR Informal Reserves.

Schedule 1 Blade-up access on State Forest and Timber Reserves

1 Background and context

The Forest Management Plan 2004-2013 (FMP) introduces a range of new requirements for the management of informal reserves in native forests. The intent of these requirements is to reduce the amount and severity of disturbance within these reserves by taking a more proactive approach to their identification and management than under previous arrangements.

The FMP states in Appendix 3 (page 89) that;

Forest with impeded access
In some forest areas, particularly in the southern forests, the heavy nature of the understorey makes it impracticable to undertake during the planning stage a complete survey for the presence of land meeting the criteria for inclusion in the corporate database as informal reserves. It is important therefore that at all stages of the preparation of a proposed disturbance operation, operational staff remain alert for potential variation to occur. For example, in the case of road construction, field verification of road alignments prior to roads being cleared and constructed may be an opportune time for further inspection to occur. In forests with a heavy understorey, verification of proposed new road alignments is achieved through blade up scrub rolling of understorey. This allows for an increased area to be accessible for inspection before more significant disturbance, such as road building activity, takes place.

The purpose of this document is to outline the acceptable procedures to be used to facilitate this work.

2 Definition of key terms

Blade-up access The flattening or laying over of understorey vegetation over a narrow corridor, without the intention of removing the root system or baring the soil for the purpose of providing access or improving visibility for planning purposes.

Scrub rolling the process of laying over or flattening of understorey vegetation and suppressed trees over a substantial area, without the intention of removing the root system or baring the soil, to provide either:

- Line of sight for operational planning;
- Improved accessibility for operational staff for planning forest operations;
- Improved access for forest workers and fallers in areas of impeded access or heavy understorey; or
- Increased manageability of edge fuels during prescribed burning or fire suppression operations.

Scrub-rolling is generally achieved using harvesting or earthmoving equipment with its blade raised above the soil surface.

Slashing The process of cutting down understorey vegetation and suppressed trees by manual or mechanical means to reduce its height.

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3 Criteria for blade-up access

The following criteria should be used to guide the use of blade-up access on State forest, timber reserves and freehold land held in the name of the CALM Act, Chief Executive Officer.

3.1 Blade-up access into forest with impeded access

The use of machines in areas identified for harvesting as shown on the coupe base plan is permitted according to the conditions identified on the approved pre-operations checklist or other approval provided by DEC. Where the activity is associated with the identification of potential informal reserves such as extensions to old-growth patches, then the disturbance should be limited to the minimum that is reasonably required to facilitate the assessment. In the circumstances where road selection or construction exploration has resulted in the location of an unforeseen informal reserve such as the position of an unmapped watercourse, the proponent staff member should record field circumstances in the Coupe Diary, and report the location of the unmapped watercourse on the Informal Reserve Amendment Request Form.

Planning for longitudinal demarcation parallel to an informal reserve should allow sufficient buffering to ensure that the resulting management boundary is no closer than the minimum width specified, and that the cumulative distance is at least as wide as the specified overall width.

3.2 Blade-up access into informal reserves

The FMP clause does not provide unconditional approval for machine intrusions into informal reserves, rather it recognises that in undertaking field survey work to determine the extent of potential informal reserves (such as unmapped old-growth patches), some work inside areas that will ultimately be recognised as an informal reserve is likely. The FMP also accepts that some disturbance may be necessary in defining the boundaries, and extent, of informal reserves.

Machine intrusions into informal reserves that are shown on the coupe base plan are not permitted without explicit approval from DEC. Where operations are likely to extend into the forest with impeded access and access to informal reserves is deemed necessary then the reasons, scope and likely location of work in the informal reserves must be identified and approved by the DEC District Manager **before** work commences.

Where there is a request to undertake exploration work to determine the position of a watercourse etc as part of planning for timber harvesting operations, the Regional Coordinator for SFM may approve the entry, in accordance with the approved *Phytophthora cinnamomi* Management Plan for the area. The FPC staff member should record field circumstances and decisions relevant to the use of blade-up access in the Coupe Diary.

Machine intrusions into known informal reserves should be restricted to those very limited circumstances where the use of manual exploration or understorey removal methods have been attempted and found to be unsuitable or unsafe. In any event, the level of disturbance should be limited to the minimum understorey modification possible with the equipment used. It should be sufficient to allow pedestrian access or line of sight.

The order of preference for approved intrusions should be:

- Manual slashing with hand tools;
- Understorey removal with engine driven brush-cutters;
- Scrub rolling with excavator; and
- Scrub rolling with wheeled or tracked bulldozer, loader or skidder. The smallest suitable machine is preferred.

In all instances the use of machines must be consistent with the requirements of the current *Phytophthora cinnamomi* Management Plan for the area, the requirements of the *Manual of Procedures for the Management of Soils Associated With Timber Harvesting in Native Forests* and / or the *Soils and Water Conservation Guidelines*.

4 Standards

The following interpretations should be used as the basis for determining whether the use of blade-up access should be approved.

Table 1 Circumstances under which intrusions into an informal reserve may be permissible.

Purpose of intrusion	Standards
All	Blade-up access should not be approved unless a current *Phytophthora cinnamomi* Management Plan is available for the area.
Determining river or stream bank location for reserve width	The use of machines to determine the width of reserves or the location of the river or stream bank for assessing width should only be approved where other techniques such as manual slashing, are impractical.
Definition of DEZ or other informal reserve boundaries	Intrusions should be limited to those areas that have been added after the preparation of the coupe base plan, following field assessment of the area originally shown as available for harvest.
Assessment of potential additional old growth areas	Where areas of old-growth are shown on the coupe base plan then a systematic grid at approximately 100 m intervals is required. Blade-up access should be limited to those areas that require assessment in the area originally shown as available for harvest.
Selecting a road alignment	Stream crossings associated with harvesting access are permissible (see Forest Management Plan 2004-2013). Blade-up access to prove road alignments is permissible. Blade-up access as part of alignment exploration may be approved where the use of other techniques such as manual slashing, have been considered and determined to be unsuitable. Blade-up access along informal reserve boundaries should be undertaken with sufficient set back to stay outside the reserve in the first instance.

5 Levels of disturbance

5.1 Recommended actions

Table 2 Recommended levels of allowable disturbance in relation to environmental aspects.

Aspect	Recommendations
Machine type and dimensions	The smallest suitable machine is preferred.
Understorey	Disturbance should be limited to understorey modification to allow pedestrian access or line of sight.
	Disturbance should be limited to the narrowest possible corridor.
	Understorey vegetation and trash should be flattened, and not pushed or heaped.
Overstorey	Saplings and suppressed whips may be removed during machine access and egress from the informal reserve.
	Trees should not be pushed over during the operation.
	The blade-up access should not damage the roots or bole of trees within the informal reserve.
Logs and ground habitat	Logs may be cut to allow a corridor to be created.
	Long logs should not be pushed around to provide access.
	Logs with natural hollows with a pipe > 10 cm diameter and length > 3 m should not be disturbed.
Soils	The blade-up access operation should not create continuous areas of bare soil > 20m^2.
	Approved work in informal reserves should be limited to periods of low risk as determined by the Trafficability Index.
Disease	Blade-up access should only be approved in periods of low risk as determined by the Trafficability Index.

5.2 Breaches of standards

Blade-up access will be considered to be a breach of the environmental standards where:

- The operation is not in accordance with the current Phytophthora cinnamomi Management Plan for the area;
- Field inspections determine that there has been an intrusion into an informal reserve as shown on the coupe base plan and the operation has not been approved in advance, or the decision to enter has not been recorded and advised to the District Manager;
- Trees have been pushed over or damaged as part of the blade-up access;
- Understorey vegetation and trash from within an informal reserve has been pushed or heaped;
- Continuous areas of soil have been bared as part of a blade-up access or scrub rolling operation in an informal reserve;
- The width and extent of the scrub rolled alignment is much more than the minimum achievable with the equipment used to allow pedestrian access or line of sight;
- Long logs have been moved, not cut, in informal reserves creating disturbance off the intended alignment;

- Logs with natural hollows with a pipe > 10 cm diameter and length > 3 m have been disturbed; or
- The width of an informal reserve is less than the minimum width required on one side and / or narrower than the cumulative distance as specified overall.

6 Recording

Wherever possible the intention to enter informal reserves should be identified in the relevant prescription or approval process, prior to the commencement of an operation.

In some circumstances, a decision will need to be made in the field to undertake exploration work to determine the position of for example a known watercourse. In these instances an appropriate DEC officer may approve the entry, subject to compliance with the conditions of the *Phytophthora cinnamomi* Management Plan for the area. The FPC staff member should record field circumstances and decisions relevant to the use of blade-up access, and advise the DEC District Manager as soon as practicable.

In the case of unanticipated disturbance of an unforeseen informal reserve such as an unmapped watercourse, the FPC staff member should record field circumstances in the Coupe Diary, and report the required information on the Informal Reserve Amendment Request Form.

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Schedule 2 Managing Hazardous Trees

It is important for DEC staff to manage public safety and burn security issues that are related to hazardous trees on public roads, facility developments and on burn boundaries prior to ignition of the burn. The use of non-destructive options must be considered in informal reserves and FHZ, and should be the preferred option across DEC estate. Consideration of these issues at the early stage will enable the implementation of non-destructive techniques to manage these trees, including;

1. Non -Destructive options

a. Advance Mop-up

This involves raking around and inside hollow-butts of hazardous trees, and can be carried out well in advance of the burn by bulldozer during scrub-rolling and burn preparation, or can be done by hand on the day of the burn.

b. Wetting Down the Tree

This is often carried out in conjunction with raking and advance mop-up. This involves crews wetting down the bark or hollow-butt of the tree with water, wetting agent or foam shortly before or during edging operations.

c. Excluding the Tree from the Burn

This can be done by the establishing a rake trail during edging, or by the construction of an access track during preparation. Where an earthmoving machine is to be used then the work must be specified and approved as part of the preparation prescription prior to this work commencing.

d. Including Additional Areas in the Burn.

This option involves increasing the burn area to allow a sufficiently large buffer to be established around the tree to provide for security. This can be planned and incorporated into the burn preparation, or as is more often the case, it can be defined and burnt out after the tree is alight. This option is often used in negotiation with neighbouring landowners to burn out small areas of pasture around a tree on the perimeter.

e. Trimming of the Crown

Carried out where the hazard is related to the presence of hollows or dead limbs in the crown of the tree. This hazard can be treated by cutting this material out of the crown, and can be done by a tree surgeon that climbs the tree with climbing irons etc, or more commonly via the use of a travel tower to access the tree.

f. Plan for Specialised Equipment

There are a number of options that involve the use of specialised equipment to assist with mop-up of the tree on the day of the burn. These can include;

- Use of a water cannon to improve the reach for ground suppression.
- Use of foam equipment to increase mop-up speed and effectiveness.
- An elevated work platform (Squirrel or travel tower) to give increased height for mop-up.

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2. Destructive Options

a. Pushing Trees using a Machine

This option is frequently used for small to medium sized trees during the burn preparation phase, and may be used in limited cases when a tree is too hazardous to fall. However because it is generally not cost effective for large hazardous trees, then there remain a large number of trees which cannot be treated using this option.

b. Falling the Tree.

This option is the most common method used to deal with hazardous trees. It can be done in conjunction with the use of machines during burn preparation or mop-up or as a stand alone option where the felled tree does not affect the perimeter track.

Fallers must be accredited to fall the trees, and they will need to be Grade 1 fallers to be able to fall hazardous trees and / or trees greater than 600 mm diameter at breast height (DBH).

c. Blasting a tree

This option is the least preferred method of dealing with hazardous trees, because it gives us the least control over where the tree will fall, and the subsequent damage that results. Blasting can only be carried out by a registered ñShotfirerò, and all work must be carried out in accordance with legal and safety requirements. It can not be carried out once a burn has been commenced.

d. Recording

To assist in responding to subsequent enquiries as to why this work was carried out, a record of the work is required. This information can be used as a basis for the work prescription which should be submitted as part of the approval process for this work.

Record of Hazardous Tree Removal

Tree No.	-
Species	-
Dead / Alive	-
Characteristics	-
Hazard or Fault	-
Map Reference	-
Sensitivity	-
Reason / Comments	-

Attach a photo of the tree.

(Repeat this for each tree to be treated in sensitive areas on the boundary)

Once a burn has been lit, the discretion for treatment of trees that pose a threat the safety or security rests solely with the Incident Controller and Operations Officer, however even in this case the use of non-destructive techniques is preferred.

Schedule 3 Salvage of logs in association with Informal Reserves

Purpose

The purpose of this schedule is to outline the procedures to be used in native forest to manage the salvage of logs that have fallen into or out from informal reserves, and to provide guidance on acceptable processes, and disturbance limits where the logs are considered to affect access and the integrity of the reserve boundary.

In all instances, machines are not permitted to enter an informal reserve to facilitate cleanup and rehabilitation, without the specific permission of the DEC Regional Manager.

Rationale

The following rationale is the basis for the contents of this schedule on the salvage of logs associated with informal reserves.

Utilisation considerations

- The volume of sawlog available to industry has been reduced in the Forest Management Plan 2004-2013 compared to previous plans making each log a valuable resource;
- Log volume contracted to customers is not dependent on the performance of the harvesting contractor. Consequently, if wood in logs felled from areas available for timber harvesting is not recovered then additional trees will be felled to replace it in the contracted supply to customers;
- Therefore if a tree that is felled or has fallen in an area available for timber harvesting is not salvaged the community loses the utilisation of this wood resource, whereas the contractor or faller loses very little;
- Any penalty for careless falling should be on the harvesting contractor and his employee, and not on the public resource;
- Manual cutting / stacking is hard work and time consuming for the faller, and should act as an incentive to limit unwanted incidents;
- Fallers who cause breaches beyond an identified threshold should be additionally penalised for their poor performance; and
- Situations where a significant portion of the tree has been felled into an informal reserve from a harvest coupe will result in the issue of a Management Letter and / or Works Improvement Notice.

Nature conservation and biodiversity considerations

- Sound logs do not contribute to ground habitat for hollow dependant species for at least many decades;
- Where the existing ground habitat is limited, trees or logs may be required to create or contribute to the required level of ground habitat. In these instances the logs should not be salvaged. Common examples of this will be in woodland areas, in wandoo stands where a large proportion of the logs are likely to contain significant hollows, or in areas with limited ground debris as a result of previous management activities; and

- In some areas it may be necessary to mark felled logs as habitat, and prescribe action to protect them from damage during burn preparation, burning or fire suppression activities.

Fire management considerations

- Logs pose an ongoing cost for mop-up during prescribed burning and fire suppression if they are within 20 m of a burn boundary; and
- If crown debris within 20 m of a burn boundary is not cut and stacked then it may result in a repeated high cost for mop-up during prescribed burning and fire suppression.

Visual Landscape Management (VLM) considerations

- Creating a cut face on a log on the edge of the informal reserve is often not desirable from VLM perspective; and
- Any proposed log salvage operation should be planned and managed to improve or maintain the visual amenity of the site, and not create any discordant element that is noticeable after more than 5 yrs.

Guidelines for decisions

The focus of this schedule is generally aimed at salvage of logs in association with activities occurring along the boundary of the informal reserve, rather than for corridors that have the purpose of crossing the informal reserve. The following criteria are to be used to guide the decisions by Regional Managers and Incident Controllers in relation to the felling, removal or salvage of logs from informal reserves:

- Salvage of all log material produced as a result of approved clearing for roads, powerlines, utility corridors, and other community infrastructure is permitted;
- Salvage of trees felled for road user safety during road maintenance is permitted;
- Salvage of trees felled for fire-fighter safety during fire suppression is permitted, on the proviso that felling should be the last resort for maintaining burn security in old-growth patches;
- All hollow logs with a pipe > 100mm diameter and length > 3m should be retained as fauna habitat; and
- If a high level of disturbance to the soil or vegetation is likely to occur during the removal operation, then the log should generally be left.

If there is any doubt as to the interpretation of these Guidelines the authority for the decision will remain with the relevant Regional Manager of DEC.

Recording

The following records are required to be created and retained:

- The decision to fell trees in informal reserves following ignition of a prescribed burn or during fire suppression must be approved by the Incident Controller and recorded in the Incident Log;
- The decision to allow a machine to enter an informal reserve to assist with mop-up, salvage logs or rehabilitate disturbance during an incident must be approved by the Incident Controller and recorded in the Incident Log;

- The decision to allow a machine to enter an informal reserve to salvage logs or rehabilitate disturbance as part of a Rehabilitation Plan must be approved by the Regional Manager of DEC and recorded on the works prescription or operational approval;
- The decision to fell trees for burn security in an informal reserve as part of burn preparation must be approved by the relevant Regional Manager of DEC and recorded on the burn prescription or operational approval;
- The decision to allow a machine to enter an informal reserve to salvage logs or rehabilitate disturbance as a part of burn preparation must be approved by the relevant Regional Manager of DEC, and recorded on the burn prescription or operational approval.
- All instances where more than 50 per cent crown and / or log substantially intrude into the informal reserve must be recorded in the Coupe Diary, and DEC advised as soon as is practicable;
- Trees to be felled and or logs to be removed, may need to be photographed before the felling or removal occurs, and the photographic record retained for future reference; and
- All logs removed are to be marked by a DEC officer.

Definition of key terms

Discordant element Any human-caused disturbance that is not in harmony with the surrounding landscape. Examples include high stumps, root balls or end cuts on logs that face the boundary, piles of tops / logs / rocks, butt damage to standing trees, severely damaged or mixed soils, extraction tracks etc.

Hard boundaries Tenure or operational boundaries that are an accurately defined lineal feature with little ambiguity with respect to its location (e.g. surveyed tenure boundary), or an interpreted line used as a management boundary which is established in the field (e.g. commonly a road, track or firebreak).

In-forest treatment This is the process of applying sawcuts to a fallen tree at the stump in order to prepare logs to an appropriate standard, prior to extraction. The process may include crown cutting, long butting, queen cutting, docking and trimming.

Soft boundaries A boundary seeking to represent a feature which is not well suited to delineation. The feature may be dynamic, variable in extent or open to interpretation. They are not yet interpreted for management or delineated in the field.

Removal of logs resulting from natural windfall in informal reserves

Situation 1 When a tree in an informal reserve has fallen across a hard boundary, and needs to be moved to permit access.

a) When only the tree crown blocks the boundary track of the informal reserves:

- Cutting and removal of the tops for management access or for burn security is required;
- Removal of the log is permitted but logs in the bole and crown may only be removed where the logs can be accessed without machine entry into the informal reserve;
- Crown debris outside the informal reserve will be stacked to facilitate burning;
- Crown debris within the informal reserve will be cross cut to facilitate burning; and
- Tops disposal of crown material from the base of trees in the informal reserve is required to a distance of 1 m for material less than 75 mm in diameter, and 5 m for material greater than 75 mm in diameter or piles of debris.

b) When the bole of the tree blocks the boundary track of the informal reserve:

- Cutting and removal of the log and tops is required for management access or for burn security;
- The removal of the log is permitted;
- Logs should be cut as long as is possible or manageable and removed. The log should be cut as close as possible to the root ball. Logs with broken ends should be removed in their entirety and treated outside the informal reserve;
- Log extraction along the centreline of the log is permitted as it should not increase damage within the informal reserve;
- No in-forest treatment should occur within the informal reserve;
- Tops disposal of crown material from the base of trees in the informal reserve is required to a distance of 1 m for material less than 75 mm in diameter, and 5 m for material greater than 75 mm in diameter or piles of debris; and
- Crown debris outside the informal reserve will be stacked to facilitate burning.

Situation 2 When a tree in an informal reserve has fallen across a soft boundary, and needs to be moved to construct a hard boundary.

Select the appropriate boundary of the reserve and demarcate this in the field according to the selection procedure or guidelines. Where it is practicable to select a hard boundary that avoids fallen trees then this should be done.

a) When only the tree crown blocks the boundary track of the informal reserve:

- The removal of the log is permitted, but logs in the bole and crown may only be removed where the logs can be accessed without machine entry into the informal reserve;
- The use of a machine to assist with removal and stacking of tops is not permitted inside the informal reserve;
- Crown debris outside the informal reserve will be stacked to facilitate burning;
- Crown debris within the informal reserve will be cut to facilitate burning; and

- Tops disposal of crown material from the base of trees in the informal reserve is required to a distance of 1 m for material less than 75 mm in diameter, and 5 m for material greater than 75 mm in diameter or piles of debris.

b) When the bole of the tree blocks the boundary track of the informal reserve:

- Cutting and removal of the log and tops to allow construction of the access track is required;
- The removal of the log is permitted;
- The use of a machine to assist with removal and stacking of tops is permitted;
- Log extraction along the centreline of the log is permitted as it should not increase damage within the informal reserve;
- Logs should be cut as long as is possible or manageable and removed. The log should be cut as close as possible to the root ball. Logs with broken ends should be removed in their entirety and treated outside the reserve;
- No in-forest treatment should occur within the informal reserve;
- Crown debris and debris from log treatment outside the informal reserve should be stacked to facilitate burning; and
- Tops disposal of crown material from the base of trees in the informal reserve is required to a distance of 1 m for material less than 75 mm in diameter, and 5 m for material greater than 75 mm in diameter or piles of debris.

Felling for fire suppression in informal reserves

Situation 3 When a standing tree in an informal reserve has been or needs to be felled for fire suppression purposes.

- Trees up to 100 m from the fire perimeter may need to be felled for burn security purposes;
- The decision to fell during an incident must be approved by the Incident Controller and recorded in the Incident Log;
- Stumps should be cut as low as is safely possible;
- Where the bole of the tree intersects the fire line, cutting and removal of log and tops for access or for burn security is permitted;
- The use of machines to push crown debris greater than 20 m into the fire to provide burn security and reduce mop-up is permitted;
- All trees that have intersected with the fire-line will be considered for log salvage;
- The log should only be salvaged if it can be removed without further damage to standing trees within the informal reserve;
- Any decision to allow a machine to enter an informal reserve to salvage logs or rehabilitate disturbance during an incident must be approved by the Incident Controller and recorded in the Incident Log;
- Log extraction along the centreline of the log is permitted as it should not increase damage within the informal reserve or create a new corridor of disturbance;
- The use of a machine to assist with removal of the logs and stacking of tops is permitted. The use of a machine in the informal reserve may be appropriate due to rapid recovery of understorey following the burn. Care should be taken to reduce the amount of soil that is

moved in this operation, as this will affect the regeneration of understorey following the fire;

- Tops disposal of crown material from the base of trees in the informal reserve is required to a distance of 1 m for material less than 75 mm in diameter, and 5 m for material greater than 75 mm in diameter or piles of debris;
- Logs should be cut as long as is possible or manageable and removed;
- Where possible, debris should be stacked on the stump as part of the Rehabilitation Plan, to facilitate burning of the cut face;
- No in-forest treatment should occur within the informal reserve;
- Debris from log treatment outside the informal reserve should be stacked to facilitate burning; and
- Where log salvage operations are identified as part of the Rehabilitation Plan and are to be undertaken after the incident is completed, they must be approved by the relevant Regional Manager of DEC.

Situation 4 When a standing tree outside an informal reserve needs to be, or has been, felled for fire suppression purposes, and has fallen into an informal reserve.

- Trees up to 100 m from the fire perimeter may need to be felled for burn security purposes;
- The log should only be salvaged if it can be removed without further damage to standing trees within the informal reserve;
- Logs should be cut as long as is possible or manageable and removed;
- Log extraction along the centreline of the log is permitted as it should not increase damage within the informal reserve or create a new corridor of disturbance;
- The removal of logs from the crown is not permitted;
- No in-forest treatment should occur within the informal reserve;
- Debris from log treatment outside the informal reserve should be stacked to facilitate burning.
- The use of a machine to assist with removal of the logs and stacking of tops is permitted. The use of a machine in the informal reserve may be appropriate due to rapid recovery of understorey following the burn. Care should be taken to reduce the amount of soil that is moved in this operation, as this will affect the regeneration of understorey following the fire;
- Any decision to allow a machine to enter an informal reserve to salvage logs or rehabilitate disturbance during an incident must be approved by the Incident Controller and recorded in the Incident Log;
- The decision to allow a machine to enter an informal reserve as part of the Rehabilitation Plan must be approved by the relevant Regional Manager of DEC and recorded on the works prescription or operational approval;
- Where a machine cannot be used, manual cross cutting of crown material within the informal reserve to facilitate burning, may be required as part of the Rehabilitation Plan; and
- Manual tops disposal of crown material from the base of trees in the informal reserve is required to a distance of 1 m for material less than 75 mm in diameter, 5 m for material greater than 75 mm in diameter or piles of debris.

Removal of a log following felling for burn preparation in an informal reserve

Situation 5 When trees have been or need to be felled for burn security purposes during burn preparation.

- Trees may only be felled with the approval of the relevant Regional Manager. This decision, and the location of the trees, is to be recorded on the burn prescription;
- Felling should be the last resort to deal with burn security issues in old-growth forest patches;
- Stumps should be cut as low as is safely possible;
- The decision to allow a machine to enter an informal reserve as part of the burn preparation must be approved by the relevant Regional Manager of DEC and recorded on the prescription or operational approval;
- Where possible debris should be stacked on the stump to facilitate burning of the cut face, in old growth patches;
- Where the bole of the tree intersects the fire line, cutting and removal of log and tops for access or for burn security is permitted;
- Tops disposal of crown material from the base of trees in the informal reserve is required to a distance of 1 m for material less than 75 mm in diameter, and 5 m for material greater than 75 mm in diameter or piles of debris;
- Logs should be cut as long as is possible or manageable and removed;
- The use of a machine to assist with removal of log and tops is permitted. The use of a machine in the informal reserve may be appropriate due to rapid recovery of understorey following the burn. Care should be taken to reduce the amount of soil that is moved in this operation, as this will affect the regeneration of understorey following the burn;
- Log extraction along the centreline of the log should be undertaken so as not to increase damage within the informal reserve; and
- No in-forest treatment should occur within the informal reserve.

Removal of logs accidentally felled into informal reserves

Where the felled tree affects access along the boundary track between the informal reserve and a harvesting area the following will apply.

Situation 6 When a tree is felled across soft patch boundaries in conjunction with a harvesting operation.

a) When less than 50 per cent of crown intrudes into the informal reserve:

- Removal of the bole of the tree is required;
- Use of a machine to extract the accessible tops back into the coupe is permitted;
- The removal of crown logs from the tops in the coupe is required;
- The faller is required to carry out manual tops disposal of crown material from the base of trees in the informal reserve to a distance of 1 m for material less than 75 mm in diameter, and 5 m for material greater than 75 mm in diameter or piles of debris.

- The use of a machine to assist with tops disposal within the informal reserve is not permitted;
- All occurrences of this nature must be recorded in the coupe diary, and
- A Management Letter is generally not required, except where it is considered that the frequency of occurrences is evidence of careless work.

b) When more than 50 per cent of the crown and bole substantially intrude into the informal reserve:

- All occurrences of this nature must be recorded in the coupe diary, and DEC advised as soon as is practicable;
- Each occurrence should be considered by DEC. If it is considered a serious breach then a Management Letter is to be prepared (see SFM Advisory Note 4, 2006);
- The faller is required to cut off the bole at crown break;
- The log is required to be snigged back into the coupe along the centre line of the log;
- The removal of logs from the crown is not permitted;
- The faller is required to carry out manual cross cutting of crown material within the informal reserve to facilitate burning;
- The faller is required to carry out manual tops disposal of crown material from the base of trees in the informal reserve to a distance of 1 m for material less than 75 mm in diameter, and 5 m for material greater than 75 mm in diameter or piles of debris; and
- The use of a machine to assist with tops disposal within the informal reserve is not permitted.

Schedule 4 Management of Access in Informal Reserves and Other Protected Areas within State Forest and Timber Reserves

Purpose

The purpose of this schedule is to outline the e requirements to protect the values contained in the informal reserve or other protected area, and to reduce the severity of disturbance associated with road and trail construction and maintenance operations within these areas and to provide guidance on acceptable processes and disturbance limits.

Table 1 provides a description of the various work components as a basis for making decisions about where the proposed activity fits with respect to the requirements of the FMP.

Table 2 identifies areas and types of work that are allowed for in the FMP as essential and necessary cases. In addition the column titled *Category of acceptability* identifies numerous levels of acceptability that are further clarified in Table 3.

Table 3 provides some examples and details about categories of acceptability identified in Table 2. The associated approval levels can be identified using the *Approvals Matrix for Operations on State Forest and Timber Reserve.*

Definition of key terms

Roads A constructed form of pavement or surface intended for access by vehicular traffic.

Scrub rolling the process of laying over or flattening of understorey vegetation and suppressed trees to provide either:
- Line of sight for operational planning;
- Improved accessibility for operational staff for planning forest operations;
- Improved access for forest workers and fallers in areas of impeded access or heavy understorey; or
- Increased manageability of edge fuels during prescribed burning or fire suppression operations.

Slashing The process of cutting down understorey vegetation and suppressed trees by manual or mechanical means to reduce its height.

Temporary Access A road / track of any standard that is constructed for use in a particular operation, but that is not required to be retained for DEC use at the completion of the operation, and must be rehabilitated.

Tracks An informal thoroughfare intended for vehicular traffic that does not necessarily conform to a formal design or construction standards.

Trails Access routes that are intended for use by various users including pedestrians, cyclists, canoeists and horse-riders (non-vehicular) as well as

motorcycles/trail bikes, 4WD/ Off Road Vehicle and boats (vehicular) that are actively promoted and managed.

Table 1 Work description for various types of work associated with access in informal reserves.

Type of Work	Works description
New road or track construction	Selection, clearing, forming, surfacing of roads or tracks and construction of bridges, culverts, and off- shoot drains to a defined road standard. Associated work may include hazardous tree removal, debris stacking, sign installation and understorey removal for safety and visibility.
Recreation trail construction	Selection, clearing, forming, surfacing of recreation tracks or trails, including construction of bridges, culverts and drains to a defined standard.
Carpark construction	Selection, clearing, forming, surfacing of carparks or parking bays off road alignments. Includes removal of trees, clearing of understorey, surfacing of carpark area, and installation of culverts and drains to a defined standard.
Road upgrading	Resurfacing and / or widening of existing roads, including limited removal of trees, the installation of additional pipes and off-shoot drains.
Recreation Trail upgrading	Resurfacing or extending the surfacing on existing trails, including limited removal of overstorey or mature secondary storey trees, the installation of additional boardwalks and drains.
Major maintenance of roads	Removal of tree and understorey regrowth from the road surface and batters, grading and or patching of the road surface, minor realignment of corners (without tree removal), maintenance of pipes and sumps, additional construction / maintenance of cross drains or offshoot drains.
Major maintenance of recreation tracks or trails	New surfacing of the track alignment, installation of boardwalks on the existing alignment, realignment of corners (without tree removal), maintenance of bridges, boardwalks, pipes or sumps requiring the use of earthmoving or lifting equipment, additional construction / maintenance of offshoot drains.
Tree removal	Removal of individual trees for safety reasons along roads, around recreation sites or adjacent to work sites.
Understorey removal	Work to modify understorey height or structure off the access corridor including understorey modification or slashing from the inside of corners or on batters for safety and visibility, understorey modification or slashing of roadside vegetation for burn preparation or strategic fire management in accordance with an approved burn prescription and understorey modification or slashing for recreation amenity.

Type of Work	Works description
General road maintenance	Work within the high point of the batters on an established road alignment. Types of work to include removal of tree and understorey regrowth from the road surface and batters, grading of the road, patching of the road surface, and resurfacing and maintenance of carparks. There is to be no additional clearing of surrounding overstorey trees or understorey vegetation or machine movement outside the high point of the road batter.
General recreation track or trail maintenance	Removal of tree and understorey regrowth from the track surface and batters, grading and or patching of the track surface, maintenance of bridges, boardwalks, pipes and sumps, additional construction or maintenance of cross drains.
Temporary access	A road or track of any standard that is constructed for use in a particular operation, but that is not required to be retained for DEC use at the completion of the operation. This generally relates to providing the access required for **emergency activities** such as rescue activities etc. These access ways will be rehabilitated following use. *This classification may be applied to some alignments used for timber harvesting or other planned activities, but the approvals for these will generally incorporate the need for field survey of alignments for DRF / priority flora, topsoil management (removal and stockpile for use in rehabilitation) and drainage.

Table 2 Category of acceptability in relation to type of protected area and type of work on State forest, timber reserve and land held in the name of the CALM Act CEO.

Type of area protected in the FMP	Type of work	Category of acceptability
INFORMAL RESERVES		
River and stream zones	New road or track construction	Acceptable 3
	Recreation trail construction	Acceptable 4
	Carpark construction	Essential cases only
	Road upgrading	Acceptable 5
	Recreation trail upgrading	Acceptable 5
	Major maintenance of roads	Acceptable 2
	Major maintenance of recreation tracks or trails	Acceptable 2
	Tree removal	Necessary cases only
	Understorey removal	Necessary cases only
	General road maintenance	Acceptable 1
	Recreation track / trail maintenance	Acceptable 1
Diverse ecosystem zones (DEZ)	New road or track construction	Necessary cases only
	Recreation trail construction	Necessary cases only
	Car park construction	Necessary cases only
	Road upgrading	Acceptable 5
	Recreation trail upgrading	Acceptable 5
	Major maintenance of roads	Acceptable 2
	Major maintenance of recreation tracks or trails	Acceptable 2
	Tree removal	Necessary cases only
	Understorey removal	Necessary cases only
	General road maintenance	Acceptable 1
	Recreation track or trail maintenance	Acceptable 1
Less well reserved vegetation complexes	New road or track construction	Necessary cases only
	Recreation trail construction	Necessary cases only
	Car park construction	Essential cases only
	Road upgrading	Acceptable 5
	Recreation trail upgrading	Acceptable 5
	Major maintenance of roads	Acceptable 2
	Major maintenance of recreation tracks or trails	Acceptable 2
	Tree removal	Necessary cases only
	Understorey removal	Necessary cases only
	General road maintenance	Acceptable 1
	Recreation track or trail maintenance	Acceptable 1
Poorly reserved forest ecosystem	New road or track construction	Necessary cases only
	Recreation trail construction	Necessary cases only
	Car park construction	Essential cases only
	Road upgrading	Acceptable 5
	Recreation trail upgrading	Acceptable 5
	Major maintenance of roads	Acceptable 2
	Major maintenance of recreation tracks or trails	Acceptable 2
	Tree removal	Necessary cases only
	Understorey removal	Necessary cases only
	General road maintenance	Acceptable 1
	Recreation track or trail maintenance	Acceptable 1

Old-growth forest	New road or track construction	Essential cases only
	Recreation trail construction	Essential cases only
	Carpark construction	Essential cases only
	Road upgrading	Essential cases only
	Recreation trail upgrading	Essential cases only
	Major maintenance of roads	Essential cases only
	Major maintenance of recreation tracks or trails	Essential cases only
	Tree removal	Essential cases only
	Understorey removal	Essential cases only
	General road maintenance	Acceptable 1
	Recreation track or trail maintenance	Acceptable 1
Travel route zones	New road or track construction	Necessary cases only
	Recreation trail construction	Necessary cases only
	Car park construction	Necessary cases only
	Road upgrading	Acceptable 2
	Recreation trail upgrading	Acceptable 2
	Major maintenance of roads	Acceptable 2
	Major maintenance of recreation tracks or trails	Acceptable 2
	Tree removal	Necessary cases only
	Understorey removal	Necessary cases only
	General road maintenance	Acceptable 1
	Recreation track or trail maintenance	Acceptable 1
RFA accredited linkage zone	New road or track construction	Necessary cases only
	Recreation trail construction	Necessary cases only
	Car park construction	Essential cases only
	Road upgrading	Acceptable 5
	Recreation trail upgrading	Acceptable 5
	Major maintenance of roads	Acceptable 2
	Major maintenance of recreation tracks or trails	Acceptable 2
	Tree removal	Necessary cases only
	Understorey removal	Necessary cases only
	General road maintenance	Acceptable 1
	Recreation track or trail maintenance	Acceptable 1
Areas previously classified as old-growth forest	New road or track construction	Necessary cases only
	Recreation trail construction	Necessary cases only
	Car park construction	Necessary cases only
	Road upgrading	Acceptable 2
	Recreation trail upgrading	Acceptable 2
	Major maintenance of roads	Acceptable 2
	Major maintenance of recreation tracks or trails	Acceptable 2
	Tree removal	Necessary cases only
	Understorey removal	Necessary cases only
	General road maintenance	Acceptable 1
	Recreation track or trail maintenance	Acceptable 1
ALL TYPES	Fireline construction or emergency access	Acceptable 6
	Construction of secondary firelines	Acceptable 7
	Felling of burning trees	Acceptable 8

OTHER AREAS		
Declared rare flora (DRF)	New road or track construction	Essential cases only
	Recreation trail construction	Essential cases only
	Carpark construction	Essential cases only
	Road upgrading	Essential cases only
	Recreation trail upgrading	Essential cases only
	Major maintenance of roads	Essential cases only
	Major maintenance of recreation tracks or trails	Essential cases only
	Tree removal	Essential cases only
	Understorey removal	Essential cases only
	General road maintenance	Essential cases only
	Recreation track or trail maintenance	Essential cases only
Threatened ecological communities (TEC)	New road or track construction	Essential cases only
	Recreation trail construction	Essential cases only
	Car park construction	Essential cases only
	Road upgrading	Necessary cases only
	Recreation trail upgrading	Necessary cases only
	Major maintenance of roads	Acceptable 5
	Major maintenance of recreation tracks or trails	Acceptable 2
	Tree removal	Necessary cases only
	Understorey removal	Necessary cases only
	General road maintenance	Acceptable 1
	Recreation track or trail maintenance	Acceptable 1
Fauna habitat zone (FHZ)	New road or track construction	Acceptable 4
	Recreation trail construction	Acceptable 4
	Carpark construction	Essential cases only
	Road upgrading	Acceptable 5
	Recreation trail upgrading	Acceptable 5
	Major maintenance of roads	Acceptable 2
	Major maintenance of recreation tracks or trails	Acceptable 2
	Tree removal	Necessary cases only
	Understorey removal	Necessary cases only
	General road maintenance	Acceptable 1
	Recreation track or trail maintenance	Acceptable 1
Other	New road or track construction	Essential cases only
	Recreation trail construction	Essential cases only
	Carpark construction	Essential cases only
	Road upgrading	Necessary cases only
	Recreation trail upgrading	Necessary cases only
	Major maintenance of roads	Acceptable 5
	Major maintenance of recreation tracks or trails	Acceptable 2
	Tree removal	Necessary cases only
	Understorey removal	Necessary cases only
	General road maintenance	Acceptable 1
	Recreation track or trail maintenance	Acceptable 1
ALL TYPES	Fireline construction or emergency access	Acceptable 6
	Construction of secondary firelines	Acceptable 7
	Felling of burning trees	Acceptable 8

Table 3 Description and examples for each of the categories of acceptability for works in protected areas on State forest, timber reserves and land held in the name of the CALM Act Chief Executive Officer.

Category of acceptability	Description	Example
Essential cases only	Cases where the type of work is determined to be essential.	Essential cases will be determined and approved by the Director of Sustainable Forest Management on the basis that failure to undertake the type of work is likely to lead to significant environmental degradation or major economic, social or safety impacts.
Necessary cases only	Cases where the type of work is determined to be necessary.	In general new road, recreation trail or other track construction should not occur in informal reserves and other protected areas. Necessary cases will be determined by the Regional Manager on the basis that failure to undertake the type of work may lead to minor environmental degradation or significant economic, social or safety impacts.
Acceptable 1	Acceptable where roads / tracks have not been identified for closure.	Acceptable on the basis that the proposed works are limited to the existing disturbed area.
Acceptable 2	Acceptable, but operation must minimise disturbance outside existing corridor.	Acceptable on the basis that the proposed works are largely limited to the existing disturbed area and the proposed disturbance outside of this area will have a limited impact.
Acceptable 3	FMP indicates disturbance is acceptable for stream crossings associated with harvesting.	Stream crossings are required for timber harvesting and are to be identified on roading proposals by FPC.
Acceptable 4	Acceptable but not preferred.	In general new road, recreation trail or other track construction should not occur in informal reserves and other protected areas.
Acceptable 5	Acceptable where alternatives are considered to be less environmentally acceptable.	Upgrading of an existing track through an informal reserve or other protected areas may be more environmentally acceptable than the alternatives.
Acceptable 6	Acceptable where alternatives are considered to be less environmentally acceptable.	Construction of firelines associated with direct and indirect attack of a fire, or other emergency incident. Approval must incorporate a commitment to rehabilitate the disturbance following the incident being declared safe.
Acceptable 7	Acceptable where alternatives are considered to be less environmentally acceptable.	Relates to the establishment of new tracks, proposed for construction as part of fall back strategies for fire suppression, where a more detailed analysis of values and consequences related to the proposal can reasonably be required.
Acceptable 8	Acceptable for fire-fighter and / or public safety, and burn security.	In all cases it is expected that the felling of trees in the informal reserves and other protected areas should only be approved by the Incident Controller following the consideration of non-destructive measures to achieve burn security or safety.

Note: The decision to establish a carpark in an informal reserve or other protected area has been raised to Essential cases only because it is considered that a carpark is an extensive disturbance and is a destination. Carparks should be located outside the informal reserve or

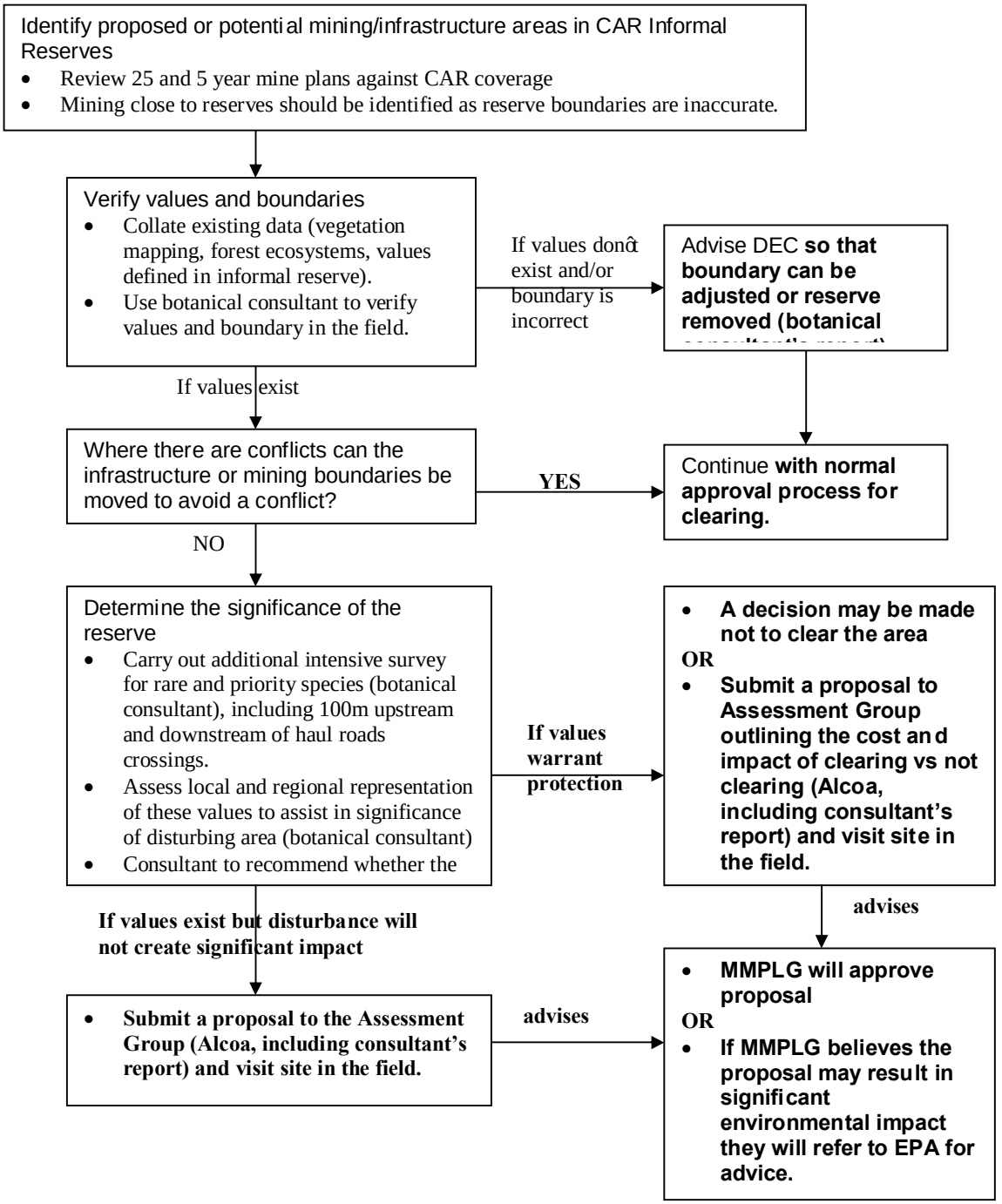
other protected area to reduce the impact of the operation on the values of the protected area. Users can be reasonably expected to walk from the carpark to the associated feature or facility if this is established within the reserve. In this case the additional disturbance in the protected area would be restricted to a trail.

The decisions related to temporary access should be made on the basis that these roads will be required to be fully rehabilitated including:

- Topsoil must be stockpiled as part of the clearing of the alignment;
- Recovery of road hardware (pipes etc) and associated infrastructure;
- Recovery of basic raw materials;
- Deep ripping of alignment to 0.8 metres with a winged-tyne ripper;
- Re-establishment of natural land contours on road alignment and associated drains and sumps;
- Replacement of stockpiled topsoil;
- Scarification of the surface;
- Replacement of the understorey species by seeding and fertilising; and
- Planting of seedlings for revegetation to a defined stocking and survival rate.

Schedule 5 Disturbance of CAR Informal Reserves in ML 1SA

ALCOA FLOW CHART



ALL AREAS ARE TO BE ACCOUNTED FOR:

- Alcoa provides details of areas of reserve that do not have values verified (Annual Report)
- Alcoa provides details of areas of reserve that are disturbed (Annual Report)
- Alcoa provides areas of informal reserve that were rehabilitated (Annual Report)
- DEC keeps a register of reserve areas reclassified or disturbed to be replaced

Approved o
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Custodian: Manager Forest Policy and Practices Branch
Approved by: Minister for Environment

PROCESS TO MANAGE DISTURBANCE TO CAR INFORMAL RESERVES BY ALCOA WITHIN MINING LEASE 1SA

(Note: This proposal deals only with *disturbance* to CAR informal reserves. Proposed review/amendment of CAR informal reserves is handled independently by DEC.)

Context

The Commonwealth of Australia and the State of Western Australia signed the Regional Forest Agreement (ñRFAò) on 4 May 1999. The RFA established both formal and informal Comprehensive, Adequate and Representative (ñCARò) reserves.

Under Clause 85 of the RFA, the parties *"acknowledge that under State arrangements Mineral and Petroleum Exploration, Mining Operations, Petroleum Operations and the establishment of related infrastructure (including access and transport) is permitted in the CAR Reserve System subject to relevant State approval processes."* This might include referral for environmental impact assessment under the Environmental Protection Act 1986, in appropriate circumstances.

RFA Clause 17 notes that the RFA does not impose on either party or a third party any obligation which is inconsistent with a law of the Commonwealth or of Western Australia *or any Government Agreement existing at the time the RFA was signed*.

Under Government (óStateô) Agreements ratified by Parliament in 1961, 1969 and 1978, Alcoa of Australia Limited (ñAlcoaò) is authorised to explore for and mine bauxite in Mining Lease 1SA, in State Forest areas of the Darling Range. The 1978 Wagerup Agreement requires Alcoa to submit annually plans for its proposed mining operations on a rolling 10 year basis. By subsequent agreement with the State, Alcoa submits five year rolling mine plans, within agreed 25 year mining óenvelopesô.

In 1979 the State established the Mining and Management Program Liaison Group (ñMMPLGò) to oversee this process and to provide whole-of-Government advice to both Alcoa and the Minister for State Development in relation to Alcoaôs forward mining plans. The MMPLG comprises representatives of the Department of Industry and Resources (Chair); the Department of Environmental and Conservation; the Department of Water, Department of Consumer Employment Protection and the Water Corporation.

The role of the MMPLG was formally endorsed in conditions issued by the Minister for the Environment in 1995 (and subsequently in 2006) for an expansion to the Wagerup alumina refinery. The Group was given delegated authority to review and make recommendations in relation to environmental aspects of Alcoaôs mining plans and to manage environmental issues relating to mining operations, community impacts of Alcoaôs operations, the development of best practice environmental principles and rehabilitation completion criteria (copies of Ministerial conditions and commitments attached).

This process has worked successfully for many years and it is an efficient and practical means of vetting Alcoaôs on-going mining operations, while minimising adverse environmental and social impacts.

Environmental Protection Act Requirements

The MMPLG process does not purport to override the requirements of the Environmental Protection Act (ñthe EP Actò). Rather, the MMPLG operates with delegated authority under conditions established by the Minister for the Environment for Alcoaôs mining operations.

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Alcoa has also given undertakings to comply with the MMPLG process for operations at Jarrahdale and Huntly mines (mining ceased at Jarrahdale in December 1998), which were established under State Agreements that predate the Environmental Protection Act.

The MMPLG recognises and accepts that it is obliged to comply with the requirements of the Environmental Protection Act. Section 38 of Part IV requires referral to the EPA where a proposal is likely to have a significant effect on the environment. The MMPLG recognises its obligations and undertakes to fulfil them, as necessary. However, because of the ample forward notice of Alcoaôs mining plans and the very nature of the MMPLGôs role and composition, environmental aspects of Alcoaôs mining proposals will normally be dealt with under the usual MMPLG process and not warrant referral to the EPA.

Proposal to deal with disturbance to CAR Informal Reserves

Given the range of experience and technical expertise available to it through its agency membership (see attached), the MMPLG considers it is best placed and qualified to advise Government on proposed disturbance to CAR informal reserves in Alcoaôs Mining Lease 1SA. **The MMPLG seeks the formal endorsement of the EPA to manage this process, as set out below, in satisfaction of the requirements of the RFA and pursuant to the 1990 and 1995 delegations of the Minister for the Environment.** Note that any planned future disturbance to a CAR formal reserve will be formally referred to the EPA for advice.

Consultation and transparency aspects

Alcoaôs mining and management plans are not generally available for public scrutiny because of their commercial sensitivity and complexity. However, the Company always consults on its forward mining plans with near neighbours who may be potentially impacted by operations (e.g. noise or dust). The plans are also presented in advance to the relevant local government authority (e.g. Shire of Waroona or Shire of Murray) in order to discuss road access and broad management issues of relevance, as well as to keep them generally informed.

The MMPLG is mindful of the high level of public interest in RFA matters and of the advisability of providing a means by which the public and/or specific interest groups can be informed of the intention to disturb CAR informal reserves for mining related purposes. Alcoa has undertaken to report on the actual extent of disturbance to CAR informal reserves in its public annual environmental report. Additionally, *the MMPLG intends to formally invite the Conservation Council of Western Australia to nominate a representative who will participate in site inspections of those areas of CAR informal reserves which the Company plans to disturb during the life of its rolling five year mine plans*.

The Conservation Council representative will be invited to attend site visits by the Mining Operations Group (ñMOGò), which is a sub-committee of the MMPLG. MOG carries out on-ground inspections of areas proposed for mining and recommends changes and adjustments to mining boundaries based on environmental and other relevant considerations. The representative will have an opportunity to learn of the plans in advance and to have input into MOGôs advisory role to the MMPLG. By this means, the Conservation Council (and its member organisations) can learn of all planned CAR informal reserve disturbances in ML1SA and will be able to influence outcomes.

MMPLG Process

1. Alcoa notifies the MMPLG annually of its forward mining plans for the next five years, with specific attention drawn to proposed mining of, or disturbance to, CAR informal reserves in ML1SA. This notification will form part of the annual submission of Mining and Management Programs (MMPs). (Note: Prior to notification by Alcoa, CAR informal reserves will be subject to field inspection by Alcoa and their status and extent clarified, where necessary, by DEC.)

2. Alcoa will take all reasonable steps, with advice from relevant Government agencies (e.g. DEC, DoW, DoIR, DOCEP and Water Corp), to avoid or minimise impacts on CAR informal reserves. All feasible alternatives to disturbance will be thoroughly evaluated and summarised in the submission of the draft MMPs to the MMPLG.

3. All CAR informal reserves which are planned to be disturbed in the next year of the forward five year mining program will be subject to detailed field examination by a suitably qualified biologist as part of the MOG process (for details of MOG role see attachment). A conservation Council representative will be invited to participate in the MOG inspections and considerations whenever it is planned to disturb CAR informal reserves. Areas of planned disturbance will be accurately surveyed and appropriately marked in the field.

4. The biologist will prepare a report on the conservation/biodiversity values of the CAR informal reserve area(s) to be disturbed, specifically in relation to RFA principles.

5. The MOG report (including the biologistôs report) will be submitted to the MMPLG as an appendix of the draft MMPs.

6. The MMPLG will review the draft MMPs and meet with Alcoa to provide advice to the Company on the issues raised, including CAR informal reserve issues.

7. The relevant Local Authority will be briefed by Alcoa on the draft MMPs. Areas of planned disturbance to CAR informal reserves will be brought to the attention of the Local Authority. The Local Authority may make broad details of proposed disturbance to CAR informal reserve areas available for the information of the local community and interested parties.

8. Any CAR informal reserve queries will be directed to either Alcoa or the MMPLG for additional information/explanation direct to interested parties. Alcoa will keep a register of comments/submissions from members of the public in respect of the CAR informal reserve areas. Alcoa will modify its draft MMPs, where appropriate.

9. The MMPLG will meet on site with Alcoa to discuss any variations and outstanding issues and to finalise the draft MMPs.

10. Final MMPs will be submitted to DoIR as Chair of the MMPLG, which recommends approval. The Minister for State Development will notify the Minister for the Environment of his intention to approve the MMPs. Once the Minister for the Environment notes the proposed action, the Minister for State Development will approve (sign) them and send a copy to Alcoa and one to DoIR.

11. The Chair of the MMPLG will formally notify the relevant DEC Director of the specific location and the area (hectares) of the CAR informal reserves in ML1SA which Alcoa plans to disturb in the approved five year mining plans. These figures will be reconciled annually (i.e. actual disturbance vs. estimated) in line with modifications to the rolling five year mining plans.

12. DEC will keep a register of CAR informal reserve areas disturbed and the particular values they represent in the context of the RFA.

13. At or near the end of the five year RFA audit period, DEC will propose replacement areas of equivalent value(s) for reservation to maintain the Stateôs RFA commitments (Clause 37). Alcoa will be consulted prior to any decision on proposed CAR informal replacement areas within ML1SA.

14. Alcoa will rehabilitate disturbed CAR informal reserve areas to a prescription which is compatible with their pre-mining vegetation composition, where feasible and practicable.

15. Alcoa will provide details of disturbed CAR informal reserves in its annual report, which is publicly available. Details of rehabilitated CAR informal reserves will also be included in the annual report.

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12 Glossary

Interpretation	The process of inspecting an area to locate and map the location of *Phytophthora cinnamomi* and to define disease risk categories associated with it, for the purpose of planning timber harvesting and other disturbance operations.
Patch	A group of trees resulting from a natural regeneration event or a past management activity such as gap creation and regeneration.
Prescribed burning	The planned application of fire under selected fuel and weather conditions to a defined area to achieve specific management objectives.
Profile falling	The managed removal of selected trees which are outside the defined are of an infrastructure site, public utility corridor or road. These trees generally have serious damage to their base, senescent crowns or are leaning towards the asset and are considered likely to damage the asset or pose a threat to public safety if they fall at a later time.
Public Drinking Water Source Area	These includes all underground water pollution control areas, catchment areas and water reserves constituted under the *Metropolitan Water Supply Sewerage and Drainage Act 1909* and the *Country Areas Water Supply Act 1947*.
Rehabilitation Plan	A plan prepared to detail the work required to rehabilitate environmental disturbance resulting from a wildfire or other unplanned disturbance.
Reserve – informal	An area set aside for conservation under an approved management plan; has had opportunity for the public to comment on changes to reserve boundaries; able to be accurately defined on a map; and is of an area and design sufficient to sustain the values it seeks to protect.
Reservoir Protection Zone	This means: a) that part of a catchment area which lies upstream of a reservoir and is within 2 kilometres of the top water level; or b) that area adjacent to a reservoir, the extent of which is identified on the plans; and c) includes the reservoir.
Target Area	An area which contains both the location of a proposed disturbance activity and surrounding land that may be impacted by it.
Tree weeds	These are species of exotic trees or native species that are non-endemic to the area.

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