Amendment to referral under EPBC Act for road upgrades and walk trail development in Fitzgerald River National Park.

The Department of Environment and Conservation advises that the final dot point in the section on vegetation and fauna habitat management on page 16 of the referral is amended as follows.

Current text: Construction materials will be obtained from outside Fitzgerald River National Park where possible. If materials are required from within the park, these are to be obtained from existing gravel or sand pits.

Amended text: Construction materials will be obtained from outside Fitzgerald River National Park where possible. If materials are required from within the park, these are firstly to be obtained from existing gravel or sand pits.

24 June 2009

Hamersley Drive

X	Y	Length
119° 56' 32.84" E	33° 56' 22.55" S	1.8
119° 41' 22.29" E	33° 44' 21.88" S	7.0
119° 42' 12.81" E	33° 45' 46.52" S	1.8
119° 44' 29.65" E	33° 46' 44.12" S	4.0
119° 44' 50.51" E	33° 47' 26.63" S	1.4
119° 45' 1.94" E	33° 47' 31.41" S	0.3
119° 45' 47.42" E	33° 47' 13.59" S	1.3
119° 46' 35.70" E	33° 47' 22.44" S	1.3
119° 47' 15.04" E	33° 48' 36.98" S	2.5
119° 48' 23.37" E	33° 49' 31.07" S	2.4
119° 49' 19.91" E	33° 50' 10.50" S	1.9
119° 49' 33.27" E	33° 50' 48.39" S	1.2
119° 50' 27.17" E	33° 51' 39.63" S	2.1
119° 52' 36.15" E	33° 52' 30.66" S	3.7
119° 53' 9.51" E	33° 52' 30.37" S	0.9
119° 54' 3.35" E	33° 51' 59.73" S	1.7
119° 54' 55.02" E	33° 52' 14.62" S	1.4
119° 55' 15.23" E	33° 53' 10.65" S	1.8
119° 55' 41.86" E	33° 53' 23.62" S	0.8
119° 56' 23.05" E	33° 53' 19.83" S	1.1
119° 56' 54.94" E	33° 53' 49.84" S	1.2
119° 56' 55.97" E	33° 54' 13.94" S	0.8
119° 57' 32.61" E	33° 54' 29.17" S	1.1
119° 57' 34.98" E	33° 55' 55.88" S	2.7
119° 55' 37.65" E	33° 56' 52.35" S	1.7
119° 41' 57.41" E	33° 44' 49.45" S	2.2
119° 57' 47.51" E	33° 56' 24.05" S	1.9
119° 58' 55.62" E	33° 56' 2.70" S	0.6
119° 59' 9.73" E	33° 55' 47.09" S	1.2
119° 59' 51.83" E	33° 55' 56.15" S	0.7
120° 0' 6.34" E	33° 55' 37.93" S	0.9
120° 0' 38.30" E	33° 55' 34.60" S	0.4
120° 0' 46.03" E	33° 55' 45.72" S	2.2
120° 1' 55.68" E	33° 55' 13.67" S	2.3

60.6 km

+10% allowing for bends and re-alignments

Total Length 66.6 km

Pt Anne Road

X	Y	Length
119° 17' 25.02" E	34° 24' 7.12" S	3.1
119° 17' 25.02" E	34° 22' 27.55" S	2.9
119° 16' 16.38" E	34° 21' 14.16" S	1.9
119° 15' 10.25" E	34° 20' 44.94" S	2.5
119° 14' 22.18" E	34° 19' 36.88" S	2.1
119° 13' 26.84" E	34° 18' 45.66" S	2.4
119° 15' 0.42" E	34° 18' 48.96" S	0.7
119° 15' 24.69" E	34° 18' 37.05" S	1.7
119° 15' 53.07" E	34° 17' 45.82" S	0.8
119° 16' 24.03" E	34° 17' 42.72" S	8.4
119° 16' 1.79" E	34° 13' 12.99" S	2.9
119° 20' 8.19" E	34° 12' 38.20" S	6.4
119° 23' 55.45" E	34° 11' 20.87" S	2.3
119° 25' 20.53" E	34° 11' 3.87" S	1.2
119° 25' 50.75" E	34° 10' 36.29" S	2.8
119° 26' 12.55" E	34° 9' 7.87" S	1.6
119° 27' 11.80" E	34° 9' 18.20" S	1.7
119° 28' 12.84" E	34° 8' 55.55" S	2.3
119° 29' 29.77" E	34° 9' 29.69" S	0.8
119° 30' 0.94" E	34° 9' 33.79" S	1.6
119° 30' 38.68" E	34° 10' 14.91" S	1.4
119° 31' 27.32" E	34° 10' 33.82" S	2.1
119° 34' 41.38" E	34° 10' 22.24" S	0.7
119° 32' 49.55" E	34° 10' 45.06" S	3.0
119° 19' 5.05" E	34° 12' 45.70" S	1.7
119° 17' 52.68" E	34° 13' 11.26" S	2.1

61.4 km

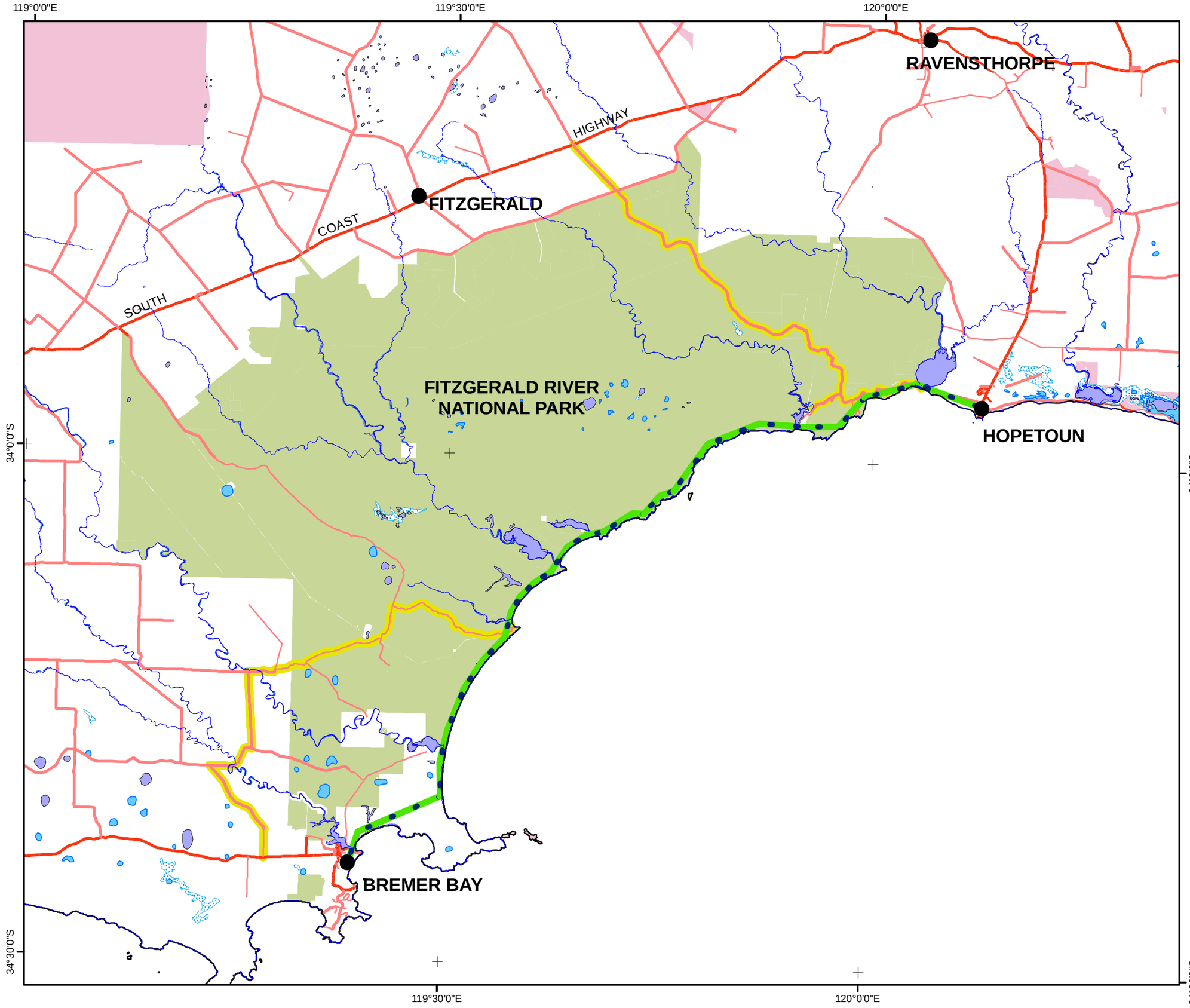
+10% allowing for bends and re-alignments

Total Length 67.5 km

Coastal Walk Trail

X	Y	Length	
119° 59' 15.72" E	33° 56' 6.72" S		
119° 57' 26.28" E	33° 57' 53.28" S	5.8	
119° 55' 15.96" E	33° 57' 56.52" S	4.3	
119° 51' 51.48" E	33° 57' 48.96" S	3.3	
119° 48' 15.09" E	33° 59' 6.91" S	5.3	
119° 45' 55.08" E	34° 1' 55.92" S	6.1	
119° 44' 56.76" E	34° 2' 13.56" S	6.3	
119° 43' 51.24" E	34° 3' 20.16" S	1.6	
119° 43' 3.72" E	34° 3' 19.08" S	2.7	
119° 41' 1.32" E	34° 4' 26.40" S	1.2	
119° 39' 50.76" E	34° 4' 39.36" S	3.8	
119° 38' 27.96" E	34° 5' 23.28" S	1.9	
119° 37' 21.72" E	34° 6' 52.56" S	2.5	
119° 36' 11.16" E	34° 7' 33.24" S	3.2	
119° 35' 13.56" E	34° 8' 22.56" S	2.2	
119° 34' 35.40" E	34° 9' 20.16" S	2.1	
119° 34' 12.71" E	34° 10' 47.56" S	2.0	
119° 32' 41.64" E	34° 12' 11.52" S	2.8	
119° 31' 23.16" E	34° 13' 54.12" S	3.5	
119° 30' 16.17" E	34° 16' 23.66" S	3.7	
119° 29' 47.43" E	34° 18' 19.19" S	4.9	
119° 29' 54.22" E	34° 20' 17.48" S	3.6	
119° 24' 5.96" E	34° 22' 29.12" S	3.7	
119° 23' 25.08" E	34° 24' 19.08" S	9.8	
120° 2' 52.44" E	33° 55' 14.16" S	3.5	
120° 7' 34.68" E	33° 56' 31.56" S	7.6	
		97.5	Indicative a
	Proposed Trail Length	100.0	km

FITZGERALD RIVER NATIONAL PARK



Proposed Walk Trail
- Indicative Alignment

Proposed Road Upgrade
- Tourist Sealed Road

1:400,000 (A3)

0 5 10 15 20 25 km

Department of
Environment and Conservation
Our environment, our future

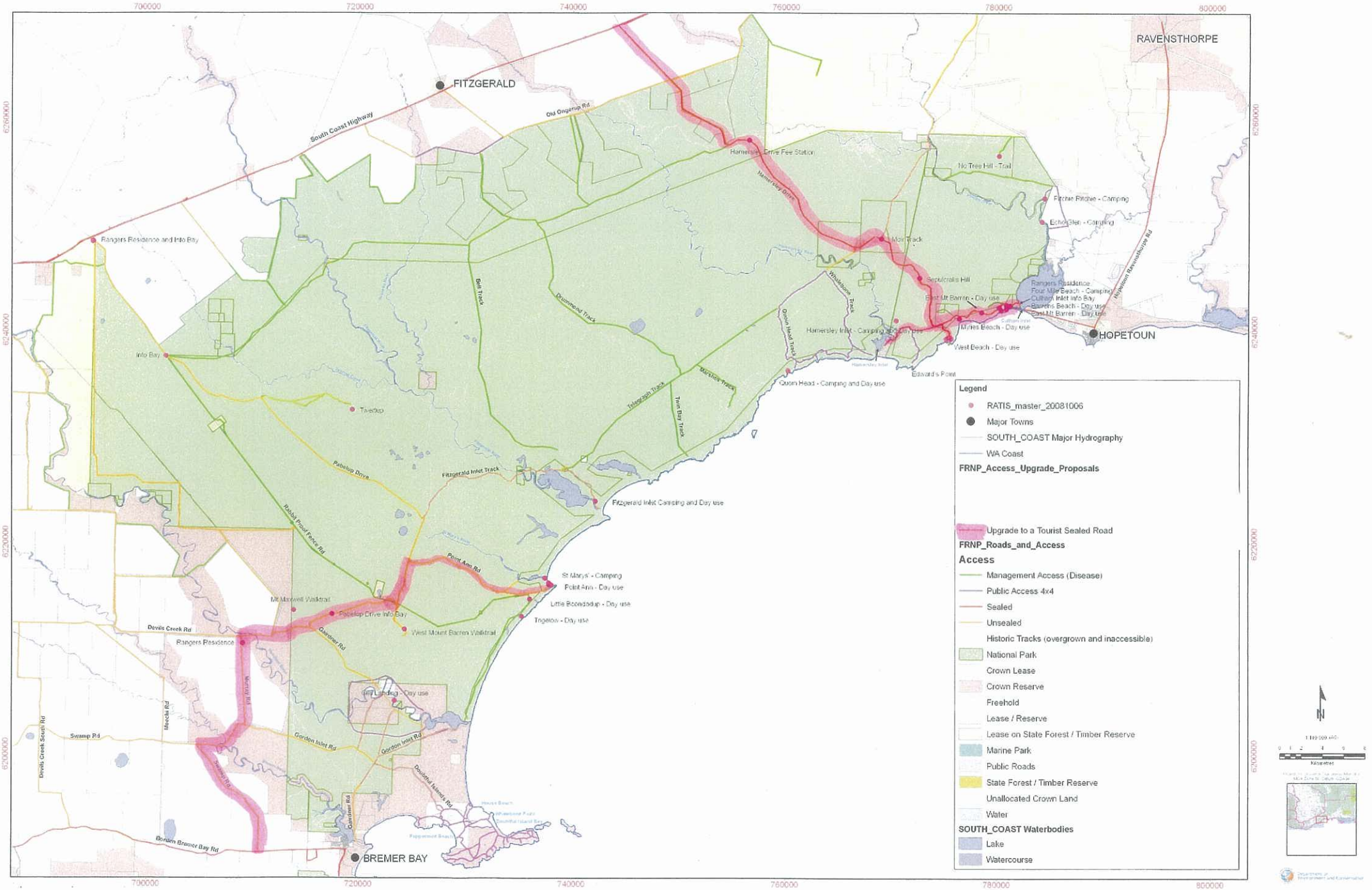
Graticule shown at 20 minutes intervals
Grid shown at 20000 metre intervals

Projection: Universal Transverse Mercator
MGA Zone 50. Datum: GDA94

Produced at 10:32am, on May 25, 2009

Produced under the Direction of
Keiran McNamara
Director General, Department of
Environment and Conservation

Fitzgerald River National Park



FIRE MANAGEMENT STRATEGY FOR THE WILDERNESS ZONE OF THE FITZGERALD RIVER NATIONAL PARK, 1999 - 2001

OVERVIEW AND RATIONALE

The Fitzgerald River National Park (330 000 ha) lies on the central south coast of Western Australia, 420 km south east of Perth, between Bremer Bay and Hopetoun in the Shires of Jerramungup and Ravensthorpe. It is one of the largest and most biologically significant National Parks in Australia and provides an opportunity to maintain substantial parts of a south coast National Park in an undisturbed state.

Major values and attractions include the highly diverse flora (almost 20% of the State's described species), numerous rare species of flora, extensive natural landscapes with rugged coastal ranges, sea cliffs, gorges, inlets, and opportunities for nature study, bush walking, camping, fishing and swimming. The Park also has richer fauna that any other conservation area in the south-west of Western Australia. It contains several threatened fauna species and offers one of the best long-term survival prospects in Western Australia for the Ground Parrot and Dibbler. Many of these values are recognised nationally and internationally.

The Fitzgerald River National Park wilderness zone is approximately 78 000 ha in size and is located in the central section of the Park (Map 1). It comprises a mixture of rugged quartzite coastal ranges, broad inland plains and uplands, and parts of the Fitzgerald and Hamersley River system including gorges and valley breakaways.

The wilderness zone is surrounded by the balance of the National Park, roughly 30-40 km wide in the south west and west, generally 10 km wide to the north and 10-20 km wide to the north east and east. Additional uncleared land surrounds much of the National Park boundary especially to the north east in the Phillips River - Ravensthorpe area.

Maintenance of Natural Values

Fitzgerald River National Park is one of the richest areas for plants in Western Australia with 1 748 identified species. About 75 of these are endemic (found nowhere else) and some 250 species are either vary rare or geographically restricted. The Park contains almost 20% of the State's described plant species. Although endemics occur throughout the Park, the highest concentration is in the Barren Ranges.

The Park also contains several threatened fauna species. The rare animals are mostly concentrated in the northern part of the Park, which overlies the granitic shield of the southern wheatbelt.

Due to the restrictions on vehicular access into the wilderness zone, there have been few additional biological or landscape surveys since 1991. However, in 1995 the detailed results of a major biological survey undertaken in 1985-87 concluded that no significant landscape impacts have occurred. The very high nature conservation and landscape status of the wilderness zone, particularly the coastal ranges, appears to have been maintained over the past five years.

Protection from Wildfires

Any fire protection strategies for the wilderness zone must address the threats of fire:

1. Entering the zone from the outside;
2. Originating in and remaining within the wilderness zone; and
3. Originating within the wilderness zone with the potential to threaten surrounding areas of National Park (e.g. adjoining special conservation zone and recreation sites at Quoin Head and Fitzgerald Inlet).

Experience gained during the suppression of wildfires in and near the Fitzgerald River National Park in the early 1990's demonstrated that the establishment of slashed or scrub-rolled buffers at least 50 m wide are highly effective in containing summer wildfires in heath and low mallee vegetation. These slashed buffers reduce fire intensity allowing fire fighters a safety margin and a greater likelihood of success in extinguishing wildfire. Buffers also provide a prepared base from which to initiate backburns against wildfires.

It has been suggested that the impact of fire on faunal species which require long unburnt habitat within the wilderness zone should be better understood before any broadscale mosaic burning is introduced. However, recently it was shown that the Ground Parrot is able to re-establish in areas burnt as recently as 6-7 years ago and may not necessarily require vegetation unburnt for at least 15 years. Fuel modification by slashing or scrub rolling, an alternative to burning, may also lead to changes in habitat at a localised level. Therefore a balance must be achieved to protect nature conservation values from risk of wildfire.

The following principles for the wilderness zone were presented in the Fitzgerald River National Park Management Plan in June 1991:

- "Owing to the unique opportunity which exists in Fitzgerald River National Park, it is highly desirable to maintain a significant cross-section of the Park as a wilderness area including coastal areas, mountains and inland gorges.

- The wilderness area should be of sufficient size and quality to meet nationally accepted criteria for wilderness designation.

- Future management intervention within the wilderness zone should be strongly discouraged other than in exceptional circumstances."

Any fire management proposals for the wilderness zone of the Park must take into consideration two scenarios:

1. Fire originating within the wilderness zone itself; and

2. Fire originating outside the wilderness zone.

In either case the nature conservation values of the zone and the contribution of any fire protection measures in the zone towards overall fire protection of the remainder of the National Park and towards Park neighbours have to be considered.

It is also important to recognise that the areas of the National Park with the highest known fauna values are located within the special conservation zone, the 10 km wide area along the northern boundary of the wilderness zone.

As a general rule protection measures such as prescribed burning, establishment of reduced fuel areas through techniques such as vegetation slashing, provision of water points for fire fighters, and safe access tracks to allow deployment of fire fighting vehicles, are successful in helping to control wildfires. However, in extreme weather situations the value of such protection work may be significantly reduced.

As in so many aspects of natural area management, the challenge is to get the balance right without jeopardising other values, in this case balancing fire protection measures against the nature conservation and recreation values of the wilderness zone.

GENERAL OBJECTIVES AND CONSTRAINTS

The overall fire management objective for the Fitzgerald wilderness is:

> **To protect the wilderness itself and surrounding areas of National Park from extensive wildfires using the minimum of human intervention.**

All operations in the Fitzgerald River National Park are subject to prior completion of environmental checklists, dieback hygiene evaluations and job safety analyses as a matter of course. Such prescriptions and checklists are to be approved by the Regional Manager prior to implementation.

In the case of the Fitzgerald River National Park wilderness there are specific constraints over and above these standard procedures:

Wilderness Values
Fitzgerald River National Park is one of the few areas on the south coast of Western Australia that is of suitable size, terrain and condition to allow its partial designation as a wilderness area. As management intervention is to be strongly discouraged in the wilderness zone, only essential or emergency works are to occur.

Biosphere Reserve Status
The Park is one of two international biosphere reserves in Western Australia - it has special value as a baseline area for monitoring long term changes in the biosphere as a whole. The wilderness zone is essentially a 'core' area within a larger biosphere reserve core. The wilderness core area should therefore be left in as natural a state as possible.

Dieback Disease
The greatest management concern in the Fitzgerald River National Park is dieback disease caused by soil fungi. Much of the regional flora is highly susceptible to the disease, and this problem is compounded by summer rainfall which provides warm, moist conditions favourable to the survival and spread of the dieback fungi. Dieback is most commonly introduced and spread in infected soil, mud or moist gravel on the wheels and underbodies of vehicles. Loss of vegetation to dieback will seriously reduce the Park's conservation and recreation values.

Dieback is now confirmed from 3 separate sites within the wilderness zone and 2 sites upslope adjacent to the zone. It is suspected from other sites along closed tracks within the zone.

All road and track maintenance, vegetation modification (i.e. slashing or scrub-rolling) and vehicular access will only be permitted *under strict dieback hygiene measures* namely dry soil conditions and clean vehicles.

In view of the above sensitivities in the wilderness zone, additional checks are to be put in place before any works in the wilderness zone may commence:

1. Environmental checklists and dieback hygiene evaluations are also to be endorsed by the Directors of National Parks and Nature Conservation.
2. Any significant departure from the broad prescriptions below is to be referred to the NPNCA.
3. Advice is to be provided by and sought from the Research and Monitoring Group (see below) as appropriate.
4. All vehicle entries are to be endorsed by the Directors of National Parks and Nature Conservation.

RESEARCH AND MONITORING GROUP

A major criticism appearing in public submissions to the draft fire management proposals for the wilderness zone was that insufficient research and monitoring had taken place to provide better information on:

a) *In situ* biological values of the wilderness
b) Impacts of fire, fire management and associated operations (e.g. track maintenance, vegetation slashing etc.)

A Research and Monitoring Group will therefore be established comprising of:

- an experienced general ecologist with local knowledge;
- an experienced fire ecologist; and
- an expert on dieback disease in South Coast vegetation.

The group will be convened by the Director of Science and Information.

It will provide input to the fire management program for the wilderness zone in the context of impacts upon biological values. It will provide advice immediately should significant findings emerge.

It will initiate appropriate research.

It will provide advice on request of the NPNCA, CALM Directors or Regional Manager. The FRNP Advisory Committee and Fire Working Group have access to advice through the Regional Manager.

The primary function of this group is to focus upon the wilderness zone and other key areas of the National Park in particular the Special Conservation Zone to the north of the wilderness.

The December 1997 Wildfire

On the morning of Saturday 27 December, 1997, two fires were started in the Thumb Peak area of the wilderness as a result of lightning strikes. The most easterly of these fires moved relatively slowly downslope on a north westerly influence but then travelled up to 5 km/hr in a north easterly direction under the influence of strong (50 km/hr) south westerly winds which persisted from mid afternoon until early evening.

Due to threats to life and property caused by other fires to the east of Hopetoun in the Jerdacuttup area, heavy equipment and fire fighting personnel which had been assembled to combat the Thumb Peak fire were redirected to assist outside the National Park. As a result the Fitzgerald fire was not able to be prevented from crossing Hamersley Drive where it was intended to stop its run at existing fuel reduced buffers. This fire was eventually contained within the Park in the Phillips and West River valley systems and northern Park boundary and to the east of Drummond Track.

The western fire on Thumb Peak remained a threat to the western sections of the National Park and was isolated by back burning along Twin Bays Track on Thursday 15 January, 1998.

The total burnt area is shown on Map 1. The wildfire itself and emergency measures taken to control it effectively implemented several of the strategies being proposed for fire management in the wilderness zone for the period 1997-2001.

Area 1 of the original proposal (see below) was not affected by the 1997 wildfire, Areas 2 and 4 were partially burnt, and Area 3 was almost totally burnt.

THE PLAN

For the purposes of fire protection strategies, the wilderness zone and some adjoining country is broken into six areas based upon:

- current fire history (including 1997 wildfire);
- existing management access; and
- natural features.

These areas are shown on Map 1 and are described in Table 1.

Table 1. Areas and Fire Risks in the Wilderness Zone

Area	Description	Fire Risks
1	Section of unburnt vegetation in north- west of wilderness zone. Area on east side effected by wildfire in 1989.	"No planned burn area" Potential for lightning strikes.
2a	The regenerating area of the 1989 fire and not affected by the 1997 fire.	The regeneration of continuous even aged vegetation over the 1989 fire area.
2b	The regenerating area of the 1989 fire which was partially burnt in the 1997 fire.	Currently limited due to deep edging burnt around entire cell.
3	The area to the north of Telegraph Track between Hamersley Drive and Drummond Track, unburnt in 1989 but burnt in 1997	Currently nil.
4a	The section of unburnt coastline between Twin Bays Track and the Dempster Inlet south of Telegraph Track.	Potential for lightning strikes in coastal peaks.
4b	Previously unburnt section of coastline between Quoin Head and Twin Bays Track, south of Telegraph Track but burnt in the 1997 fire.	Currently nil.

Fire management objectives and strategies for the six areas are illustrated on Map 1 and are as follows:

AREA 1

Objective

Seek to retain the unburnt vegetation in the north-west section of the wilderness zone fire-free for the duration of this plan.

Strategies

1.1. Pursue the implementation of fuel reduction programmes in adjacent areas as nominated in the existing Fitzgerald River National Park Management Plan with minimal burning of riparian vegetation where possible (Map 1).

1.2. Ensure existing firebreaks and management tracks bordering the northern boundary of this area are maintained. This will be achieved by a combination of grading and slashing adjacent vegetation to a minimum width of three metres. Erosion control measures will be considered and undertaken where necessary.

AREA 2a

Objective

Seek to create a broad mosaic of vegetation ages across the 1989 fire regrowth by the introduction of mosaic burning towards the end of the present plan (1999-2001).

Strategies

2.1. Maintain Drummond Track as a strategic fire access track suitable to be travelled by low loader traffic. This entails:

2.1.1. Clear running surface to width of four metres and resheet soft sandy sections with gravel where required.

2.1.2. Clearing of regrowth vegetation.

2.1.3. Maintaining in a well drained condition with all water course crossings established.

In its present condition Drummond Track meets these standards.

2.2. Maintain Telegraph Track from Fitzgerald Inlet Track to Quoin Head Track as a strategic fire access track suitable to be travelled by heavy duty fire trucks. This entails:

2.2.1. Maintaining a running surface to width of three metres.

2.2.2. Maintaining in a well drained condition with major water course crossings established.

In its present condition the section of Telegraph Track from Drummond Track to Quoin Head Track meets these standards and the balance of Telegraph Track from Drummond Track west to Fitzgerald Inlet nearly meets these standards.

2.3. Maintain a low fuel zone associated with Drummond Track as is now in place due to the 1997 fire.

This strategic break will assist in preventing and/or controlling a major east-west or west-east running wildfire.

2.4. Introduce some fire into the 1989 fire area between Drummond Track and the former Bell Track to contribute to the development of a broad mosaic of vegetation ages across the Park.

This would involve a once only introduction of fire, mainly using aerial ignition, towards the end of the plan period (1999-2001) with the aim of reducing fuels in approximately 10-30% by area of the cell. Ignition would be undertaken on westerly winds under moderate fire index ratings Work along the north side of Telegraph Track (2.2 above) will be required to reduce risk of fire crossing into area 4a. This is to be either or a combination of edge lighting or slashing.

2.5 Establish water point adjacent to southern end of Drummond Track in moisture gaining site.

2.6 Assess the impact of mosaic burning on ecological indicators such as effect of drought stress, seed set and faunal implications.

AREA 2b

Objective

Seek to maintain the mosaic of vegetation ages in this 1989 fire regrowth area which was partially re-burnt in the 1997 fire.

Strategy

2.7 Apply sections 2.1 to 2.3 of section above.

AREA 3

Objective

Maintain until at least 2001 with no planned fire activities.

Strategies

3.1. Undertake erosion control work on degraded section of Telegraph Track between Hamersley River and Quoin Head Track and design detour.

3.2 Undertake roadside slashing to a minimum width of 3 m on the north side of Telegraph Track between Drummond Track and Hamersley Drive. This would be done during the latter stages of the plan as regrowth occurs. Due consideration to be given to vegetation changes and visual impact.

AREA 4a

Objective

Seek to retain the area of coastal vegetation south of Telegraph Track between Twin Bays Track and Dempster Inlet unburnt for the duration of this plan.

Strategy

4.1. Maintain access for light 4WD fire units only along Twin Bays Track.

AREA 4b

Objective

Maintain until at least 2001 with no planned fire activities.

Strategy

4.2. Undertake a general biological survey at the site for future comparison with burnt sites.

EXISTING FIRE MANAGEMENT

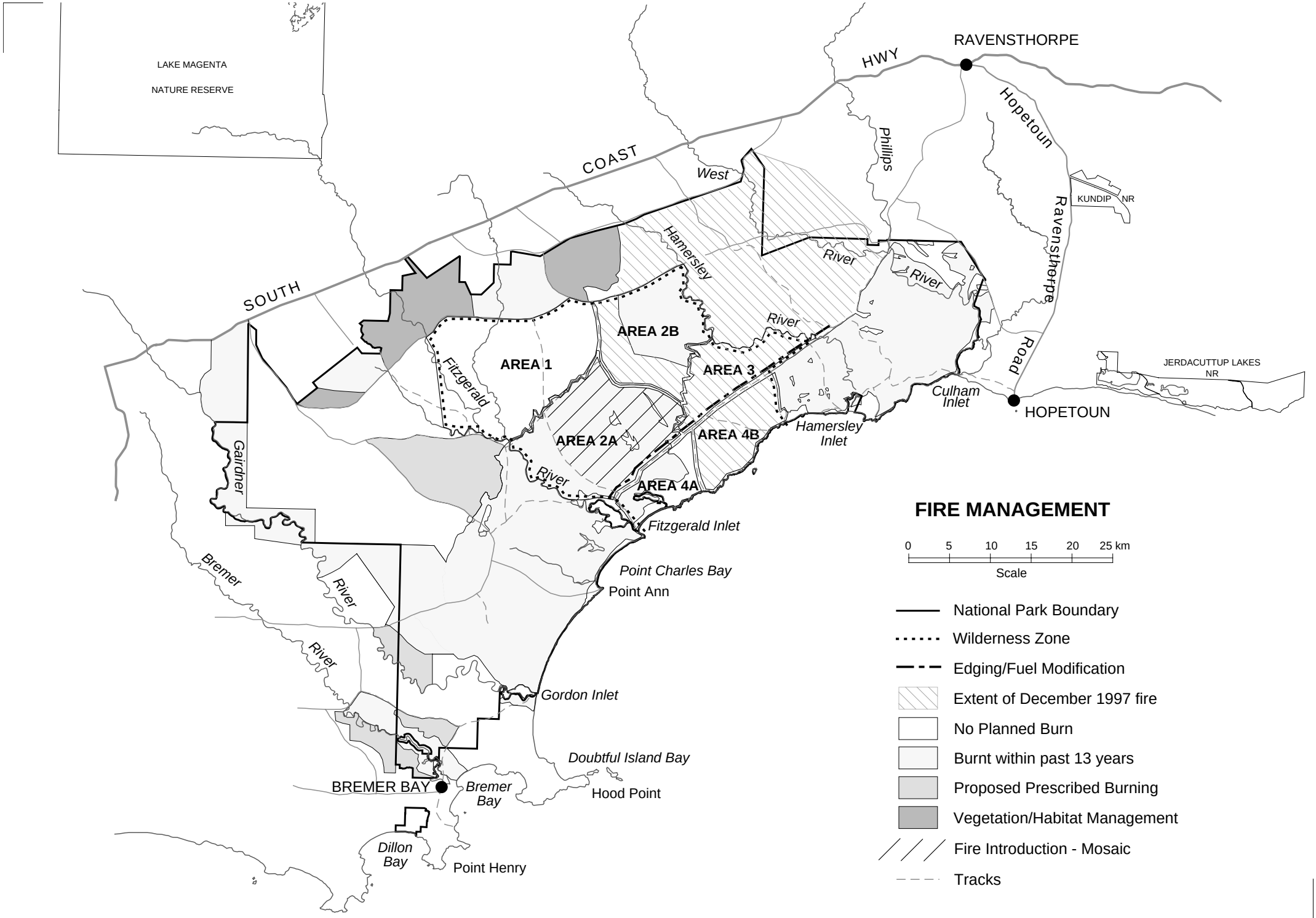
Other additional strategies required to ensure suitable fire protection measures are in place for the remainder of the Park, are contained within the original intent of the current management plan. These strategies will be continued to be prioritised by the Fire Working Group and implemented by CALM.

IMPLEMENTATION

These proposals will be implemented by CALM in liaison with the Fitzgerald River National Park Advisory Committee and the Fitzgerald River National Park Fire Working Group.

REVIEW

These proposals once adopted and/or amended will remain in force until such time as further review by the NPNCA or as part of the review of the Fitzgerald River National Park Management Plan, scheduled for the year 2001.


LAKE MAGENTA
NATURE RESERVE
RAVENSTHORPE
HWY
COAST
SOUTH
West
Phillips
Hopetoun
KUNDIP NR
Ravensthorpe
Road
Hamersley
River
River
River
AREA 1
AREA 2B
AREA 3
AREA 2A
AREA 4B
AREA 4A
Fitzgerald
Gairdner
Culham Inlet
Hamersley Inlet
HOPETOUN
JERDACUTTUP LAKES NR
Fitzgerald Inlet
Point Charles Bay
Point Ann
Bremer
River
River
Gordon Inlet
Doubtful Island Bay
BREMER BAY
Bremer Bay
Hood Point
Dillon Bay
Point Henry
FIRE MANAGEMENT
0 5 10 15 20 25 km
Scale
National Park Boundary
Wilderness Zone
Edging/Fuel Modification
Extent of December 1997 fire
No Planned Burn
Burnt within past 13 years
Proposed Prescribed Burning
Vegetation/Habitat Management
Fire Introduction - Mosaic
Tracks

APPLICATION TO THE CONSERVATION COMMISSION FOR MECHANISED ACCESS WITHIN THE FITZGERALD RIVER NATIONAL PARK FOR ESSENTIAL MANAGEMENT OR RESEARCH OPERATIONS

1. **Location of the proposed access**
   Core Wilderness Area: Mt Drummond, Thumb Peak, Woolbemup, Mid Mt Barren, south Drummond Track, Twin Bays Track and Telegraph Track.

2. **Relationship of the proposal to any existing relevant documents or plans (e.g. management plans, interim management guidelines, policies, recovery plans).**

   The *Fitzgerald River National Park Management Plan 1999 — 2001* Section 3 Prescription 2 states:
   Vehicle access within the centre of Fitzgerald River National Park (FRNP) requires approval by the NPNCA (now the Conservation Commission) as a requirement of the Management Plan. Specifically the most relevant provision (13 Access — Prescription 7) states:

   > *Exclude vehicles from the centre of the Park to reduce the risk of phytophthora) dieback introduction and/or spread to the lowest possible levels. Vehicle access for dieback sampling and fire management will be allowed under strict permit, subject to NPNCA approval. if a life-threatening emergency arises requiring the use of vehicles within these areas, entry will be authorised by the South Coast Regional Manager or a representative. Access for fire management purposes in the centre of the Park will be reviewed in 1995 (refer to 9.2 Fire).*

   The '1995 review' was significantly delayed due to major fires in the wilderness zone requiring the development of new fire management strategies but it was eventually gazetted on 18 January 2000 as an amendment to the Management Plan. It included clauses stating:

   > *All vehicle entries, environmental checklists and dieback hygiene evaluations are to be endorsed by the Directors of National Parks and Nature Conservation.*

   In direction relation to the proposed survey the *Fitzgerald River National Park Management Plan 1999 — 2001* Section 7.3 Prescription 7 states

   > *Investigate habitat requirements and ecology of rare species by: a. conducting comprehensive surveys to determine broader distribution and b. studying each species to determine which habitats, including vegetation structures, compositions and fire ages, are used.*

   The proposed survey addresses this prescription for specific survey of threatened fauna taxa (Western Ground Parrot). Surveys for Western Ground Parrots were conducted in Spring 2007, and only one individual was confirmed present in the area. A follow-up survey in Autumn 2008 detected at least two individuals present. However, an accurate estimate was difficult because calling was unreliable and the birds appeared to be quite mobile. Further surveys are required to establish the status of this population.

   The *South Coast Threatened Birds Recovery Plan* details recovery actions for the Critically Endangered Western Ground Parrot *Pezoporus wallicus flaviventris.* Monitoring known Western Ground Parrot populations is a key action in this plan.

3. Purpose and objectives of the proposed access

Project title: Survey of threatened fauna populations, namely Western Ground Parrot.

Objective/Goal: To follow-up the autumn 2008 surveys of the known Western Ground Parrot (CR) population in the Wilderness area.

Brief Outline of works proposed: A team of five staff and volunteers will complete this project work within the Wilderness area, minimising vehicle access, disturbance and time required in the area. The proposed survey work will be conducted in the Wilderness Zone of the Fitzgerald River National Park in autumn 2009, with survey timing dependent on access conditions. It is proposed to spend up to 10 days surveying areas previously known to support a small population of Western Ground Parrots.
The proposed project team comprises Abby Berryman, Jeff Pinder, and three volunteers. A vehicle are necessary to transport field equipment and camping gear (existing track network).

4. Timing of proposed access

A ten day period of access is proposed dependent on dry soil access conditions, with work to be completed in autumn 2009.

Commencement date: 23 March 2009 Completion date: 20 April 2009

5. Mechanised access proposed

Vehicle/Machine Type	Number of Vehicles/Machines	Number of Entries	Est'd Duration (days)
Toyota Hilux 4x4 (1QBF651) with trailer	1 (plus trailer)	1	10

6. Consideration of alternatives to mechanised access

In order to complete this survey work a period of ten days is required. It is not considered practicable to walk in on a daily basis to complete survey work given the distances involved, and equipment necessary for this survey effort. For example Ground Parrot survey work necessitates being in situ for listening sessions an hour before sunrise and an hour after sunset.

7. Likely environmental impacts of access and how these impacts can be minimised and/or rehabilitated, such as: - soil erosion/damage

Under dry soil conditions no impacts of access are anticipated. All mechanised vehicle movement will be on existing tracks, namely Drummond Track, Telegraph Track, Fitzgerald Track and Twin Bays track. Impacts from camping will be minimised by establishing camp on an existing track junction. Human waste will be maintained by use of a single pit toilet.

8. ***Phytophthora cinnamomi*** **hygiene plan for vehicular access for project works in FRNP wilderness area**

Hygiene Tactics	To be applied (Tick where appropriate)	Person Accountable
All staff and volunteers involved to receive dieback hygiene training prior to undertaking works	✓	Regional Manager
No entry or works under wet soil conditions	✓	Regional Manager
Vehicle wash down prior to entry	✓	Senior Operations Officer or District Manager
No movement within survey area in event of rainfall	✓	Senior Operations Officer or District Manager
Ensure all staff follow appropriate root hygiene protocols for any off-track work	✓	Senior Operations Officer or District Manager
Local vehicle permit issue custodian	✓	Senior Operations Officer or District Manager

9. **Endorsement and Approvals**

Endorsed by Regional Manager, South Coast Region

Bruce Bone. ..... Date 23 /03/2009

Endorsed by Director of Nature Conservation

Gordon Wyre. ..... Date 22/03/2009

Approved by Chairman or Director of CCWA

John Bailey. ..... Date /03/2009

Gordon Graham. ..... Date /03/2009

ADDITIONAL BACKGROUND TO SURVEY PROPOSAL

The Western Ground Parrot is endemic to Western Australia, and is declared threatened. It is currently Critically Endangered. The total population size in 2008 was estimated to number less than 140 individuals, occurring only in Fitzgerald River and Cape Arid National Parks. Fitzgerald River NP was previously considered the stronghold of this bird. However, the population there has declined alarmingly in recent years and now numbers fewer than 16 individuals. Additionally, the number of subpopulations in Fitzgerald River NP has declined. The Wilderness Area now contains one of only two known sub-populations remaining in Fitzgerald River NP.

This small sub-small population was found in the Wilderness Area in 2005, and it was hoped that this population was still extant, but surveys conducted in Spring 2007 only detected a single bird in the area previously occupied. A further survey in Autumn 2008 detected at least two birds, possibly even three or four.. However, these birds were calling unreliably and seemed to be quite mobile, so an accurate estimate of numbers was difficult. Actions specified in the South Coast Threatened Birds Recovery Plan, which is overseen by the WA South Coast Threatened Birds Recovery Team, include monitoring sub-populations of this species to determine status and trends.

Environmental Protection Authority

Guidance for the Assessment of Environmental Factors

(in accordance with the Environmental Protection Act 1986)

Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia

No. 56

June 2004

Western Australia

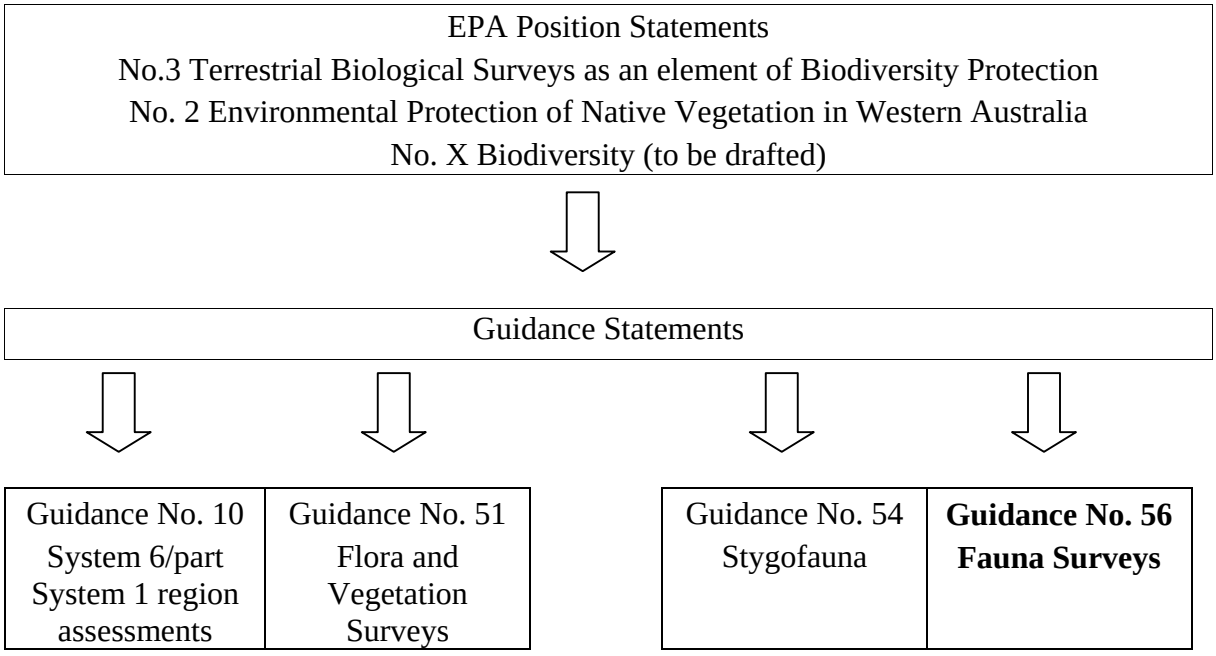
FOREWORD

The Environmental Protection Authority (EPA) is an independent statutory authority and is the key provider of independent environmental advice to Government.

The EPA's objectives are to protect the environment and to prevent, control and abate pollution and environmental harm. The EPA aims to achieve some of this through the development of environmental protection Guidance Statements for the environmental impact assessment (EIA) of proposals.

This document is one in a series being issued by the EPA to assist proponents, consultants and the public generally to gain additional information about the EPA's thinking in relation to aspects of the EIA process. The series provides the basis for the EPA's evaluation of, and advice on, development proposals subject to EIA. The Guidance Statements are intended to assist proponents in achieving an environmentally acceptable proposal. Consistent with the notion of continuous environmental improvement and adaptive environmental management, the EPA expects proponents to take all reasonable and practicable measures to protect the environment and to view the requirements of this Guidance as representing the minimum standards necessary to achieve an appropriate level of fauna survey for the assessment of environmental factors.

This Statement provides guidance on the standard of survey required to assist in collecting the appropriate data for decision-making associated with the protection of Western Australia's terrestrial faunal biodiversity and its habitat. The flowchart below shows the relationship between Position Statements and this and other Guidance Statements.



While the EPA has provided this guidance to encourage best practice in fauna and faunal assemblage survey and reporting, it is conscious that the process has also highlighted the need for complementary measures to promote such goals. In short, it is clear that the wider scientific community has a role to play in fostering skills and expertise. Firstly, the universities have a role to play in developing graduate skills in the areas of zoology, taxonomy, biogeography, ecology and statistics, which are amongst the basic prerequisites in this line of endeavour. It is evident that there has been a shift away from these areas as society places more emphasis on areas such as biotechnology. Secondly, practising zoologists and ecologists have a role to play, by mentoring recent graduates, and, perhaps most importantly, providing them with the opportunity to experience the breadth of the diversity at first hand. Thirdly, all practitioners have a role in developing a progressively improved synthesis of the fauna and zoogeography of the State. These matters are not specifically covered in this guidance.

While guidance is provided specifically in relation to the Western Australian *Environmental Protection Act, 1986*, proponents are reminded to ascertain any responsibilities they may have in regard to this issue under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*

This Guidance Statement has the status of '**Final**' which means it has been reviewed by stakeholders and the public. The EPA has signed off the Guidance Statement and published it although it will be updated regularly.

I am pleased to release this document that now supersedes the draft version.

Walter Cox
CHAIRMAN
ENVIRONMENTAL PROTECTION AUTHORITY

June 2004

Contents

Guidance Statement No. 56

Guidance Statement for Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia

Key Words: **animal species assemblages, biodiversity, biological surveys, IBRA, terrestrial fauna, faunal assemblages, Priority fauna, short-range endemics, Specially Protected Fauna**

1 INTRODUCTION

1.1 Purpose

The primary purpose of this Guidance Statement is to provide direction and information on general standards and protocols for terrestrial fauna surveys to environmental consultants and proponents engaged in EIA activities. The generic process for the writing of Guidance Statements is set out in Appendix 1.

This guidance should be used when preparing documentation for referral of proposals, planning schemes and their amendments to the EPA, as well as for formal assessment and audit.

This Guidance Statement:

- addresses the general standards and a common framework for terrestrial fauna and fauna assemblages for EIA in Western Australia, the quality and quantity of information derived from these surveys, and the consequent analysis, interpretation and reporting; and
- is primarily directed at the subset of biodiversity contained in all terrestrial faunal groups.

This guidance will assist in the interpretation and application of the general principles outlined in the EPA's Position Statement No. 3: *Terrestrial Biological Surveys as an Element of Biodiversity Protection* (Environmental Protection Authority 2002). It should be read in conjunction with Guidance 51 when planning for biological surveys for EIA and when practical fauna and vegetation surveys should be coordinated.

This Guidance also aims to promote survey work of sufficient rigour to contribute to a more systematic inventory of the State's biota. A more uniform approach to biodiversity appraisal is intended to provide a progressively better collective inventory of biodiversity and ecosystems. Such an approach is compatible with a

consolidated, unified and readily accessible system of environmental information.

1.2 Policy context

1.2.1 State legislation

A range of legislation is relevant to biodiversity conservation in Western Australia. This includes the *Environmental Protection Act 1986* (EP Act), the *Conservation and Land Management Act 1984*, and, in particular, the *Wildlife Conservation Act 1950*.

The Government proposes to replace the *Wildlife Conservation Act 1950* with a new Biodiversity Conservation Act. The new Act will provide for the protection and restoration of biodiversity, and the sustainable use of native plants, animals and other organisms.

1.2.2 Requirements for assessments which are accredited under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

Under the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) proposed actions which have the potential to have a significant impact on a matter of national environmental significance must be referred to the Commonwealth Minister for the Environment for a decision as to whether assessment is required under the provisions of that Act.

Provision has been made within the EPBC Act, for State authorities to be accredited to undertake environmental assessments, either jointly with or on behalf of the Commonwealth, so as to meet the requirements for assessment under that Act. The related requirements and arrangements for this are discussed in the EPBC Act itself and in the provisions of bilateral agreements being negotiated between State and Commonwealth governments. A bilateral agreement between Western Australia and the Commonwealth has been signed and came into effect on 20 October 2003, the date on which accommodating EP Act amendments were assented to in the Western Australian Parliament.

Assessments must adequately address the potential impacts on matters of national environmental significance in order to comply with the provisions of the EP Act and be accredited under the EPBC Act.

1.2.3 International and National policy context

A number of International policies and agreements are part of the framework for the protection of biodiversity:

- Wetlands of International Importance
  - 1971 – *The Convention on Wetlands of International Importance* (Ramsar Convention);
- Agreements covering migratory birds
  - 1974 – the *Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment* (Japan-Australia Migratory Bird Agreement – JAMBA published as "Australian Treaty Series 1981 No. 6" by the Australian Government Publishing Service, Canberra, 1995);
  - 1979 – *Convention on the Conservation of Migratory Species of Wild Animals* (held in Bonn, Germany); and
  - 1986 – the *Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment* (China-Australia Migratory Bird Agreement – CAMBA published as "Australian Treaty Series 1981 No. 22" by the Australian Government Publishing Service, Canberra, 1995).

The State has committed to an agreed framework, principles and objectives for the protection of biodiversity with the adoption of the *National Strategy for Ecologically Sustainable Development* (Commonwealth of Australia 1992) and the subsequent *National Strategy for the Conservation of Australia's Biological Diversity* (Commonwealth of Australia 1996). Western Australia was the first State to become a signatory to the latter, which followed from Australia's ratification of the United Nations Convention on Biological Diversity. In 2001 Western Australia endorsed the *National Objectives and Targets for Biodiversity Conservation 2001-2005* (Commonwealth of Australia 2001).

The EPA intends to ensure that, as far as possible, development proposals in Western Australia are consistent with, or do not conflict with, these principles, objectives and targets.

State of the Environment (SoE) reporting is now a legislative requirement at the Commonwealth level and has been adopted by Western Australia. SoE reporting aids environmental decision-making and enables assessment of progress towards ecological sustainability. It is important that environmental impact assessment reflects and reports on the 'core' environmental indicators developed for SoE reporting, some of which are biodiversity indicators (ANZECC 2000).

Accordingly, the EPA is seeking to improve the consistency and the standard of fauna surveys to ensure that decisions relating to protection of biodiversity are based on appropriate information that accords with agreements between the State and the Commonwealth.

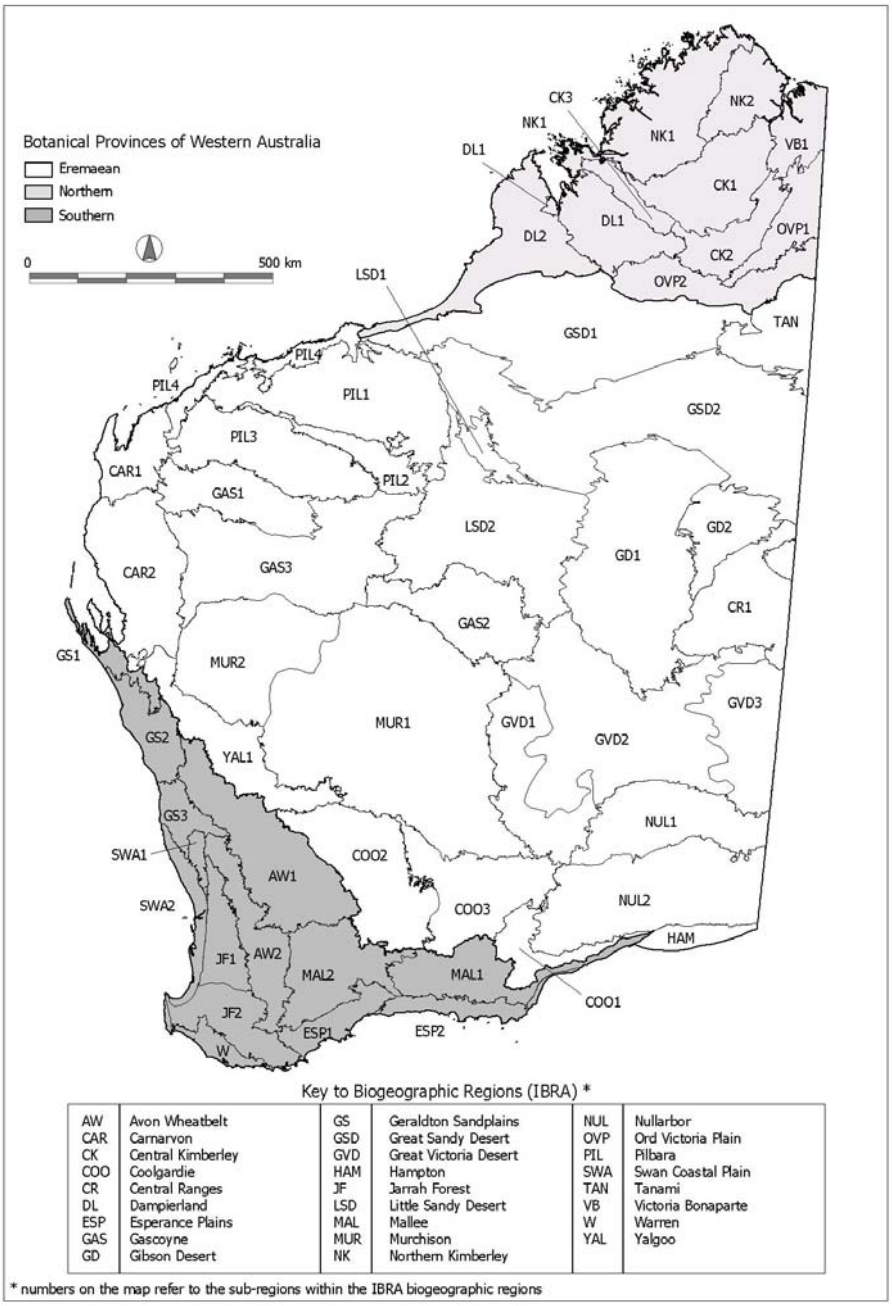


Figure 1: A Map of Western Australia showing the Botanical Provinces[1] (after Beard 1980), the IBRA bioregions (Environment Australia 2000) and the IBRA subregions (McKenzie et al. 2000).

[1] The Coolgardie and Yalgoo bioregions are here placed in the Eremaean Botanical Province (see Section 2.3 in Guidance 51). However, while their biotic composition is intermediate between the Eremaean and the South-West Provinces they are more closely allied with the South-West Province (GJ Keighery pers. comm. 2004).

1.2.4 Related policies of the Environmental Protection Authority

1.2.4.1 Position Statement No.3 on terrestrial biological surveys

In March 2002, the EPA published Position Statement No. 3 entitled *Terrestrial Biological Surveys as an Element of Biodiversity Protection* (Environmental Protection Authority 2002). In that document the EPA discussed the range of International, National and State agreements and policies currently influencing the future protection of biodiversity in Western Australia and the need to review and improve the quality and quantity of information required for EIA.

Position Statement No. 3 indicated that the EPA adopted the definition of Biological Diversity and the Principles as defined in the *National Strategy for the Conservation of Australia's Biological Diversity* (Commonwealth of Australia 1996); that the quality of information and scope of field surveys should meet standards, requirements and protocols as determined and published by the EPA; and the Interim Biogeographic Regionalisation of Australia (IBRA) should be used as the largest unit for EIA decision-making in relation to the conservation of biodiversity. The IBRA has identified 26 bioregions in the State (Figure 1) that are affected by a range of different threatening processes and have varying levels of sensitivity to impact. Terrestrial biological surveys should provide sufficient information to address both biodiversity conservation and ecological function values within the context of proposals and the results of surveys should be publicly available.

Following a workshop in July 2000 on the draft Position Statement No. 3, the EPA decided that because of the diversity of ecosystems, separate guidance statements were warranted to address the range and complexity of issues pertaining to biological surveys.

Issues and survey types under consideration for incorporation in a series of guidance statements related to terrestrial biological surveys include:

- terrestrial fauna and faunal assemblage surveys (this Guidance);
- flora and vegetation surveys (Guidance 51);
- subterranean fauna in groundwater and caves (Guidance 54);
- karst environments;
- data acquisition and submission; and
- threatening processes.

Therefore this Guidance Statement forms part of a series in response to Position Statement No. 3, and is intended to be read in conjunction with that document and Guidance Statement No. 51 (Environmental Protection Authority 2004) as well as others that may be published in the series.

For projects located in the System 6 Region or the southern Swan Coastal Plain this Guidance Statement should also be read in conjunction with Guidance

Statement No. 10, *Guidance Statement for Level of assessment for proposals affecting natural areas within the System 6 region and Swan Coastal Plain portion of the System 1 region* (Environmental Protection Authority 2003a).

1.3 Limitations of this Guidance

This Guidance Statement is:

- confined to matters relating to terrestrial fauna and faunal assemblage surveys, and the treatment of associated data, and does not address more proposal-specific issues, which are the preserve of proposal-specific guidelines or approved scoping documents. Accordingly, it does not provide prescriptive guidelines for survey methodology. A useful reference for survey methodology is that adopted in South Australia to collect data for the Environmental Data Base of South Australia (Government of South Australia 2000);
- the contemporary view of the EPA until such time as this document is subject to review;
- not an instrument for predicting outcomes of deliberations by the EPA; and
- intended to apply to proposals yet to come before the EPA.

2 DIVERSITY OF THE FAUNA AND FAUNAL ASSEMBLAGES

2.1 The high diversity and endemism of the fauna

Australia's biota is recognised as one of the 12 most diverse in the world (Common and Norton 1992; Mummery and Hardy 1994). The faunal biota of Western Australia is diverse but incompletely documented (Hopper *et al*. 1996). The vertebrate groups are the best documented with an estimated 3,168 species (see Table 2 in Hopper *et al*. 1996). However, in some groups, especially fishes, frogs and reptiles, entirely new species are described almost every year (Aplin *et al*. 2001). The 1,900 species of fishes referred to by Hopper *et al*. (1996) has been increased to 3,127 species Hutchins (2001).

Figure 2 shows the increase in named species among the terrestrial vertebrate groups over time since the early exploration of Western Australia. This reflects the continuing growth of knowledge of the State's biodiversity as more areas are surveyed.

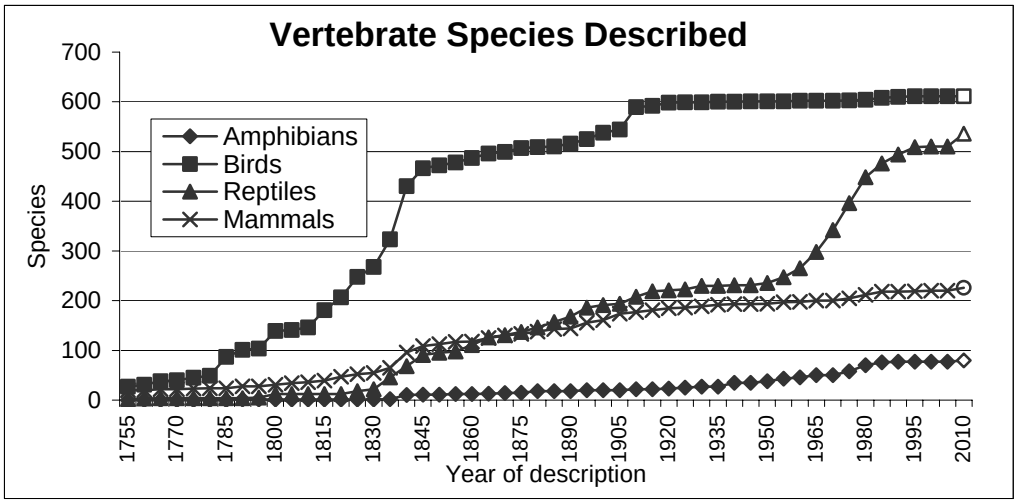


Figure 2: Number of species of Western Australian vertebrates described over time and the potential numbers for 2010 based on known yet to be described taxa.

Some faunal groups have a high level of endemism to Western Australia. For example, Horwitz (1994) commented on endemism patterns in the freshwater fauna and Hopper *et al*. (1996) noted that 49% of amphibians, 60% of reptiles, 18% of mammals but only 3% of birds were endemic to Western Australia. They estimated that 60% of the estimated 10,000 species of Chelicerata (spiders), 75% of the estimated 1,000 species of Myriapoda (millipedes and centipedes), and 55% of the estimated 30,000 species of Crustacea were endemic to Western Australia. However they were not able to estimate what percentage of the estimated 50,000 species of Insecta were endemic to Western Australia.

2.2 Short-range endemics

Comprehensive systematic reviews of different faunal groups often reveal the presence of short-range endemic species (Harvey 2002). Among the terrestrial fauna there are numerous regions that possess short-range endemics. Mountainous terrains and freshwater habitats often harbour short-range endemics, but the widespread aridification and forest contraction that has occurred since the Miocene has resulted in the fragmentation of populations and the evolution of many new species. Particular attention should be given to these types of species in environmental impact assessment because habitat loss and degradation will further decrease their prospects for long-term survival.

Harvey (2002) considered that although there were occasional short-range endemics among the vertebrates and insects, there were much higher numbers among the molluscs, earthworms, some spider groups (especially the mygalomorphs), millipedes, and some groups of crustaceans. Short-range endemics generally possessed similar ecological and life history characteristics,

especially poor powers of dispersal, confinement to discontinuous habitats, slow growth and low fecundity.

Some better known short-range endemic species have been listed as threatened or endangered under State or Commonwealth legislation but the majority have not. Often the lack of knowledge about these species precludes their consideration for listing as threatened or endangered. Listing under legislation should therefore not be the only conservation consideration in environmental impact assessment.

The State is committed to the principles and objectives for the protection of biodiversity as outlined in *The National Strategy for the Conservation of Australia's Biological Diversity* (Commonwealth of Australia 1996). The EPA expects that environmental impact assessment will consider impacts on conservation of short-range endemics in accordance with these principles and objectives.

3 THE GUIDANCE

3.1 EPA's objectives and their application to environmental impact assessment

3.1.1 The environmental objectives

This Guidance Statement provides information to proponents, consultants and the general public on the EPA's requirements for terrestrial fauna and faunal assemblage surveys and resulting survey reports. It details the minimum requirements for when a survey is required, what type and extent of survey is required and the minimum standard of interpretation of survey data which is required in the fauna and faunal assemblage survey report and related environmental assessment and evaluation (see definitions).

The objectives of this Guidance are to ensure that:

- there is clarity for proponents on the scale of fauna and faunal assemblage survey appropriate for different areas;
- the fauna and faunal assemblage survey, analysis, interpretation and reporting undertaken for EIA is of a suitable quality and of consistent methodology to enable the EPA to judge the impacts of proposals on fauna and faunal assemblages;
- the environment, in particular significant fauna and faunal assemblages, is identified and protected through best practice in the conduct and reporting of fauna and faunal assemblage surveys for EIA;
- Western Australia's knowledge base of fauna and faunal assemblages and biogeography are developed and enhanced over time at both the local and regional scale to the benefit of future decision making; and

- survey data are capable of underpinning long-term observation and measurement for later compliance and audit purposes (especially as this pertains to completion criteria for projects).

3.1.2 Environmental factors and EPA objectives for each factor

Section 44 of the EP Act requires the EPA to report to the Minister for the Environment on the environmental factors relevant to proposals and planning schemes that it formally assesses under Part IV of the Act. The environmental factors are described in the scoping document (for proposals under Section 38) or instructions (for Schemes and their amendments under Section 48A) for the required environmental review document. The EPA's objective for each environmental factor and the investigations that will be undertaken by the proponent (proposals) or is required of the responsible authority (schemes and their amendments) to evaluate whether these objectives can be achieved is also defined in the scoping document or instructions.

The initial identification of factors should be undertaken by the proponent during the preparation of referral and scoping documents (see Section 3.1.3).

3.1.3 Application of the guidance to environmental impact assessment

This Guidance will apply when preparing documentation for referral of proposals, planning schemes and their amendments to the EPA for formal assessment and audit where fauna and faunal assemblages are likely to be impacted as a result of implementation. Additional or special requirements for individual projects may be identified in the scoping document or instructions or in other advice provided via correspondence with the proponent or the responsible authority. Scoping documents or instructions should normally be consistent with this Guidance. However, in certain circumstances there may be a need to vary requirements to suit the particular case, and this would be set out in the scoping document or instructions.

3.2 Planning and design of fauna and faunal assemblage surveys

All proposals, planning schemes and their amendments where fauna and faunal assemblages will be impacted as a result of implementation of the proposal, scheme or amendment should report fully on natural values, potential impacts, cumulative impacts, and options to minimise impacts. Documentation should identify the degree to which the advice and approach provided in this Guidance Statement has been followed. Divergence from these standards should be highlighted in sections dedicated to limitations (see Section 3.3.1).

The EPA has provided below, guidance on what needs to be considered when surveys are being undertaken to provide information about fauna and faunal assemblages relevant to a proposal.

3.2.1 Approaches, resources and standards required

The State's fauna is highly diverse and only partially known, and appraisal of it is a highly technical and skilled process. Therefore it is expected that for fauna and faunal assemblage surveys:

- there will be adequate provision of resources for the survey and documentation of the fauna and faunal assemblages:
    - the intensity of sampling will reflect the likely faunal diversity due to the complexity of the vegetation and habitats of the proposal area;
    - adequate resources are directed to fauna sampling and identification, specimen processing and subsequent lodgement of specimens in the Western Australian Museum. This should include allowance for a possible species verification lag due to other commitments by taxonomists and the lack of availability of some taxonomic specialists; and
    - adequate resources are directed to data analysis and interpretation;
- there will be a high degree of rigour in reporting not only to describe current fauna and faunal assemblages but also to facilitate subsequent EPA assessment and auditing; and
- there will be a requirement for standardisation of techniques and terminology. It is important that survey methods are given minimum standards so that future work on the fauna and faunal assemblages is comparable.

3.2.2 Stage of proposal when surveys should be commissioned

For any proposal, the timing of fieldwork is critical to the whole process of survey and reporting on fauna and faunal assemblages. It is the first part of a process, and the natural fluctuation in rainfall may delay fieldwork. For example, heavy rainfall may cause delays with trapping and consultants need to comply with animal welfare requirements. A significant lead-time is required as it may be necessary to undertake surveys at various times of the year depending on the nature of the assemblages and species in the subject area. Survey over multiple years may be required where a single year's data is not adequate to determine the faunal assemblage (see How 1998, How *et al*. 1991) or to address the environmental factors.

There may also be a lag time due to appropriate faunistic expertise being unavailable. Proponents should make allowance for this lag when project planning, as it is a consequence of best practice. Consequently the EPA urges proponents to commission fauna and faunal assemblage surveys as early as practicable in the planning/site selection phase of a development or scheme to avoid potential for delays in project approvals.

For environmental monitoring and management, it is essential that fauna and faunal assemblage surveys have been conducted before the project area is cleared or otherwise modified.

3.2.3 Who should lead and undertake fauna and faunal assemblage surveys

Fauna and faunal assemblage surveys should be coordinated and led by fauna specialists who have had:
a) training, experience and mentoring in the area of fauna identification/fauna and faunal assemblage surveys and/or specific training in elements of survey or sampling theory and Australian fauna identification and zoogeography; and
b) would normally have had a wide exposure to WA's fauna and faunal assemblages, preferably with knowledge and experience in the region being surveyed.

It is recognized that the survey team will often include assessors who are less experienced. However, these team members should be supervised at all times by experienced and suitably qualified supervisors. The latter will enable the skill development of all zoologists involved in the work, which will assist in the development of professional skills within the wider industry. The universities also have a key role in developing graduate skills; in recent years there has been a tendency to shift away from the classical aspects of taxonomy and statistics, even though these are critical to fauna surveys.

Fauna and faunal assemblage survey reports should acknowledge all persons involved in the survey and their role in the survey. This includes acknowledging all specialists involved with specimen identification or species verification. The report should state who was responsible for its compilation.

These are specialist scientific and technical reports that should appropriately acknowledge authorship and contributions. The EPA sees this as part of the process of properly valuing this work and promoting good standards.

3.2.4 When fauna and faunal assemblage surveys should be conducted

The EPA expects that the design of fauna and faunal assemblage surveys, including sampling methods, duration and timing, will be appropriate to the faunal group being sampled and will use methods appropriate to the region of the State. In many cases the timing of a fauna and faunal assemblage survey will be critical in terms of the results of the survey providing adequate information and certainty levels with respect to whether the EPA's relevant environmental factors can be met. It is therefore essential that the timing of fauna and faunal assemblage surveys be such that the survey objective/s can be met.

The appropriate timing of fauna and faunal assemblage surveys will therefore need to be considered early in the planning phase of a development proposal or scheme. Environmental and planning consultants, staff of government authorities and the

EPA all have a role in bringing these requirements to the attention of development proponents as early as possible in the planning process for proposed developments or schemes (or their amendment).

In general fauna and faunal assemblage surveys conducted for baseline information (i.e. the first detailed survey of the area prior to development) should be multiple surveys conducted in each season appropriate to the bioregion and the faunal group. The most important seasonal activity times for many faunal groups are related to rainfall and temperature. Thus, a survey in the season that follows the season of maximum rainfall is generally the most productive and important survey time. However, in some cases there may also be a need to time surveys according to the seasonal activity patterns of particularly important species (such as Specially Protected Fauna or Priority species) or particular assemblages (e.g. molluscs or amphibians). In the case of surveys conducted for formal EPA assessments, the EPA's proposal-specific guidelines may specify these species and/or assemblages. In other cases (such as where the survey is carried out prior to referral of a proposal) advice on which are likely to be important species or assemblages may be sought from the Department of Environment (DoE) and (particularly with respect to proposals in current or proposed conservation reserves) the Department of Conservation and Land Management (CALM).

3.2.5 Determining the extent and level of survey required

The scale and nature of impact and the sensitivity of the receiving environment will govern the indicative levels of faunal survey expected by the EPA. These were outlined in EPA's Position Statement No. 3 (Environmental Protection Authority 2002) and are presented in Appendix 2.

Aspects of the environmental factors and objectives and the scope of the required survey may be set out by the EPA in proposal-specific Guidelines (in the case of environmental assessments by the EPA). In this case, the specific direction provided in the EIA Scoping Document or Instructions will take precedence within the context of the approach and expectations set out in this document. However in the absence of specific direction in these documents, the scope will be determined by the objectives of the survey consistent with expectations established in this Guidance Statement. Resource considerations are also relevant, provided that the survey will provide sufficient information for the EPA to determine whether or not the objectives for specified relevant environmental factors can be met.

3.2.6 Determining survey sampling design and intensity

Factors likely to influence sampling design include :

- bioregion – level of existing survey/knowledge of the region and associated ability to predict accurately;
- landform special characteristics/specific fauna/specific context of the landform characteristics and their distribution and rarity in the region;

- lifeforms, life cycles, types of assemblages and seasonality (e.g. migration) of species likely to be present;
- level of existing knowledge and results of previous regional sampling (e.g. species accumulation curves, species/area curves;
- number of different habitats or degree of similarity between habitats within a survey area;
- climatic constraints, e.g. temperature or rainfall that preclude certain sampling methods;
- sensitivity of the environment to the proposed activities;
- size, shape and location of the proposed activities; and
- scale and impact of the proposal.

During the planning stage before fauna and faunal assemblage surveys are conducted, the EPA expects that proponents will consider the methods, including any constraints, of other surveys in the region. Useful references in this context include Biological Surveys Committee of WA (1984), Burbidge *et al.* (2000a), How *et al*. (1984, 1991) and papers in Burbidge *et al.* (2000b). A useful manual for vertebrate survey methodology is that used in South Australia to collect data for the Environmental Data Base of South Australia (Government of South Australia 2000). The sampling design should be adequately explained and justified in the survey report.

The duration and spatial scale of fauna sampling are pivotal in environmental impact assessment and the methodology design and intensity of the survey needs careful consideration and will vary regionally and take into account local conditions. For example, studies (e.g. How 1998, How *et al*. 1991, Rolfe and McKenzie 2000) have shown that extensive sampling effort is required in both a temporal and spatial scale before the composition of a herpetofaunal assemblage (including its rarer species) can be adequately determined. At Bold Park on the Swan Coastal Plain, How (1998) showed that 80% of the reptile assemblage was recorded only after 40 days of systematic trapping, but in specific habitats the mean effort expended to record 80% of the assemblage was over 75 days. In the east Pilbara, a study by How *et al*. (1991), which extended over 58 days of pitfall trapping over nine trapping periods over three years over eight discrete habitats, revealed that 25 trapping days elapsed before 80% of the pitfall trapped assemblage was recorded. However, the assemblage revealed by pitfall trapping represented only 58% of the 67 reptile species recorded by all means during the survey.

Survey methodology, duration and timing will vary according to the faunal group being surveyed. For example, the timing of molluscan surveys is crucial. An apparent paucity of molluscs may be due to the relative humidity or time of day, rainfall and temperature on the day of the survey, over the preceding weeks or even in the previous year when conditions were not advantageous for breeding and survival of the young. For mollusc surveys for example, surveyors need to be skilled in assessing habitat diversity as it pertains to snails, and in using the

various techniques (dismantling rock piles, excavating burrows, sieving for micro-molluscs, etc.) that are appropriate for searching for snails (live or dead, active or aestivating).

The relative efficacy of sampling methods for terrestrial vertebrates has been analysed (e.g. How *et al*. 1984, 1991 and Rolfe and McKenzie 2000) for different parts of Western Australia. The EPA expects that analysis of faunal assemblage data will take cognisance of sampling bias in favour of some groups while under sampling others.

3.3 Presentation and reporting

3.3.1 Identifying the limitations of the survey

It is essential that every fauna and faunal assemblage survey report contains a section describing the methods used and the limitations of these methods. This is particularly important as it will enable assessment officers to determine whether the survey is adequate to address particular issues. The survey techniques for each of the faunal groups sampled should be detailed including person/hours and number of traps/area.

Detailing survey limitations are important as they fulfil three functions:

- they are a discipline that requires the author of the fauna and faunal assemblage survey report to consider any factors which may have limited or compromised the results, or omissions from the survey, and any issues which could not be addressed within the survey scope;
- in the spirit of transparency they clearly signpost such compromising factors in a way that should indicate the capacity of the survey and the report to address issues; and
- they may act as insurance to the practitioner against being perceived by others to have made false claims.

Limitations may cover constraints such as:

- competency/experience of the consultant carrying out the survey;
- scope (what faunal groups were sampled and were some sampling methods not able to be employed because of constraints such as weather conditions, e.g. pitfall trapping in waterlogged soils or inability to use pitfall traps because of rocky terrain or impenetrable subsoil);
- proportion of fauna identified, recorded and/or collected ;
- sources of information e.g. previously available information (whether historic or recent) as distinct from new data;
- the proportion of the task achieved and further work which might be needed;
- timing/weather/season/cycle;
- disturbances (e.g. fire, flood, accidental human intervention etc.) which affected results of survey;

- intensity (in retrospect, was the intensity adequate);
- completeness (e.g. was relevant area fully surveyed);
- resources (e.g. degree of expertise available in animal identification to taxon level);
- remoteness and/or access problems; and
- availability of contextual (e.g. biogeographic) information on the region.

3.3.2 Requirements for data presentation

As far as possible, data collected for fauna and faunal assemblage surveys being conducted for EIA or for other consideration by the EPA should be gathered and presented in quantitative form. Results presented within fauna and faunal assemblage survey reports can be used to interpret data or make qualitative observations, but the information to support the key results should be presented in a form that would allow an appropriately qualified third party to evaluate.

Nomenclature
The EPA is seeking to ensure comparability between different EIA reports, both in project methodologies and especially in the nomenclature of species involved. Agencies with the primary responsibility for compiling the State's species listing are the Western Australian Museum in the case of the fauna and the Herbarium (CALM) in the case of the flora. EIA reports will be expected to use current listings from these agencies.

In the case of vertebrate species the acceptable nomenclature will be that determined by the Western Australian Museum as provided in the original or current (including electronic) versions of *Checklist of the vertebrates of Western Australia*. EIA reports will quote the appropriate authorities for the nomenclature used for each vertebrate group, e.g. Hutchins (2001) for fish, Aplin and Smith (2001) for amphibians and reptiles, Johnstone (2001) for birds, and How *et al*. (2001) for mammals. For non-vertebrate groups for which there are no current comprehensive species listings it is expected that EIA reports will use the most recently available names and the appropriate departments in the Museum should be consulted for advice.

3.3.3 Preparation of fauna and faunal assemblage survey reports

Generally the person/s involved in the planning and implementation of the relevant fauna and faunal assemblage survey should be responsible for preparing these reports. In some cases there may be a need for quality endorsement by more experienced persons. However these persons should also be qualified to undertake surveys as set out in Section 3.2.3.

3.3.4 Setting the context for survey design and reporting

The key policy reference dealing with the environmental significance of impacts on fauna and faunal assemblages in Western Australia is Position Statement No. 3 (Environmental Protection Authority 2002). Position Statement No. 3 outlines the policy context for the protection of biodiversity throughout Western Australia, and in particular regions. In Position Statement No. 3 the EPA sets out key elements that are relevant to its consideration of proposals which impact on biodiversity. These elements provide the general framework for the objectives and design of fauna and faunal assemblage surveys because, in order to properly assess the environmental significance (and acceptability) of proposals, the EPA needs to be able to answer specific questions based on the elements identified. These questions also relate to any specific objectives that the EPA has identified as being relevant to a particular project, via the process of providing proposal-specific assessment guidelines, and to the requirements of the Commonwealth for matters of national environmental significance.

As Western Australia is a very large State with considerable local and regional environmental variation, the nature, scope and intensity of the fauna and faunal assemblage survey required may vary according to the region, in response to regional characteristics such as spatial heterogeneity and geographic distribution. These requirements need to be considered on a region-specific basis and are described in Appendix 2.

Aspects of 'context ' will generally include, but not be limited to:

- objective of the survey (foreshadowing the contribution of the work);
- review of background (literature search, metadata search including appropriate search of specimen databases, e.g. W.A. Museum *Faunabase*);
- characteristics of the fauna of the site at the international, national, State, regional, local level as appropriate;
- appraisal of current knowledge base/framework;
- what specific areas of information will be investigated (e.g. regional and local biogeographical significance, biodiversity, species richness, conservation status, threatening processes); and
- review of other environmental work carried out in the area and relevant to the proposal.

3.3.5 Format of survey reports and data

The findings of the fauna and faunal assemblage survey should be submitted in two ways:

1) As a stand-alone report, which may also appear whole as an appendix of an environmental review document:

- To the EPA

  In both hard copy (including any original habitat or other maps) and electronic form (with mapped data in a digital format). (Note: the EPA intends to develop guidance in the near future on the requirements for submission of data from biological surveys.)

- To the public

Available in hard copy from the proponent at a cost no greater than that of the main environmental review document; and

2) As an overview within the environmental review document

The environmental review document should include, within its text, a clear overview of the findings on the biodiversity and conservation values of the fauna and associated impacts. It is imperative that the overview accurately and directly represents the discussion, conclusions, recommendations, summary and limitations of the base survey report. The conclusions, summary and limitations of the base survey report should also be evident in the summary and conclusions of the environmental review document. The authors of the fauna survey report should be responsible for preparing the conclusion, summary and limitations, or at least vet these sections, and should sign the reports to indicate their agreement with the material presented.

3.3.6 Public availability of fauna survey reports submitted for EIA

The EP Act stipulates that the EPA [Section 39(1)(a)(b) and 39(5)] and proponents [Section 40 (2)(a)(4)(a)(b)] make information publicly available as part of the environmental review process.

The EPA considers that:

- the public availability of information on biodiversity is fundamental to the environmental review process and good decision-making;
- all survey work on fauna and faunal assemblages should contribute to the sum total of knowledge for the State; and
- any disclaimer within an environmental review or survey document must recognise that the work is primarily for the purposes of environmental impact assessment under the EP Act, is consequently publicly available, and is subject to the limitations outlined in the methods of the survey document.

The EP Act provides for particular and limited protections on confidential information [Section 39(2)(3)(a)(b)(4) and Section 120]. The *Freedom of Information Act 1992* also applies.

3.3.7 Use of terminology

Terminology should be clear and standardised, preferably using those terms listed in Section 6 of this Guidance.

3.3.8 Acknowledgement of contributors and attribution of all sources of data

Scientific and technical documents should appropriately acknowledge all contributions and authorship (this includes Environmental Review documents). This is important to the process of properly valuing all work and promoting basic standards.

Fauna and faunal assemblage survey reports should list the names of all persons involved in both the survey and the preparation of the report and briefly state their role. Acknowledgements should also extend to any other contributors including external expertise sought.

Other sources of data should be fully attributed and referenced to the original source. This includes metadata (including GIS), maps, figures and tables copied or adapted from other sources.

3.3.9 Record keeping for the purpose of audit

The EPA's requirement for information provided in fauna and faunal assemblage surveys is for the source data from surveys to be readily available for a reasonable period (7 years) following the survey so that:

- subsequent supplementary or time-sequence surveys can be adequately designed;
- survey limitations are transparent to data users; and
- the surveys themselves are verifiable and auditable by a third party.

Accordingly, the base data collected in surveys (including details of sample dates, precise location, habitat details, etc.) should be retained in the form originally collected for a minimum of 7 years after the survey was completed.

The EPA advises that from time to time there will be random and opportunistic audits of fauna and faunal assemblage surveys (and/or related reports). In some cases (usually for major projects in sensitive areas) fauna and faunal assemblage survey reports (and related data) may be subject to peer review by an independent faunal survey practitioner.

As outlined in Position Statement No. 3, the EPA expects that information obtained as part of environmental impact assessment should be made permanently available to the public. To achieve this, the EPA intends to encourage the coordinated development of a statewide database for EIA-related biological surveys in consultation with environmental practitioners and Western Australian natural resource management agencies and authorities. To achieve this end, it is desirable that an electronic version of the fauna data is provided to the EPA, so that it can be used to consolidate knowledge of the State's biota and progressively add to the knowledge base of the biodiversity of Western Australia and provide an improved basis for future decision-making.

The EPA proposes to work with survey practitioners and officers of the Western Australian Museum and CALM to develop an appropriate set of protocols for the presentation, storage, acknowledgement and accessibility of faunal information.

3.4 The role of the surveyor in increasing biodiversity knowledge

As a result of the limited amount of detailed fauna and faunal assemblage survey data available for most regions of Western Australia, much of the fauna survey work conducted is of an exploratory nature and there is significant potential for new discoveries or findings. This may significantly challenge or revise conventional understanding of the distribution or abundance of fauna and faunal assemblages.

This leads to a need for persons engaged in fauna and faunal assemblage surveys to act as scientific advocates and bring to the scientific, government, and public arenas, new information gathered in the course of the survey. This contributes to an increase in collective knowledge and ensures that decisions on biodiversity protection are based on the best available information.

For example, the EPA would expect that animal specimens collected and not readily identifiable as common, would be vouchered to the Western Australian Museum and that specimens which reflect taxonomic anomalies or which are found to occur beyond the previously known range of a taxon would be highlighted in the fauna and faunal assemblage survey report and brought to the attention of relevant authorities (e.g. Western Australian Museum, CALM, the EPA etc.).

Additionally, fauna and faunal assemblage survey reports should identify whether any animal taxa or assemblages present are restricted or whether the survey area is an outlier or known extremity of the range of those taxa/assemblages.

3.5 Auditing or peer reviewing surveys

The EPA does not have the resources to undertake systematic review of all fauna and faunal assemblage surveys or reports. To ensure that the methods and standards applied in surveys are of a standard that is adequate to ensure quality environmental assessment by the EPA, a proportion of projects may be selected at random for the audit process. In such cases, selected parts of the survey and the related report (i.e. a sample of the work) may be audited.

Peer review may be warranted for some EIA surveys, particularly where the EPA or the practitioner conducting the main fauna and faunal assemblage survey considers that the survey is in an area or bioregion which is poorly known or in which a limited range of specialists may be qualified or experienced. Such review must be undertaken by experienced and suitably qualified professionals (Section 3.2.3). Unless there are matters in dispute, the peer review would normally be conducted at the expense of the proponent. The EPA will normally seek to inform the proponent

of the likely requirement for a peer review in the project-specific guidelines or approved scoping documents.

Core elements of the peer review process in science are that:

a) the choice of reviewer/s is made by a body independent of the author and the report commissioners (in this case, the EPA is the independent body);
b) the reviewers are qualified and experienced professionals, with levels of relevant experience and expertise at least equivalent to those of the people they are reviewing;
c) the reviewers are clear as to the scope and the limitations of the review (general limitations are considered);
d) the reviewers can remain anonymous; and
e) there is an opportunity to re-submit work after revision.

4 APPLICATION

4.1 Area

This Guidance Statement applies throughout the State of Western Australia and will apply to all new proposals, planning schemes and amendments to schemes.

Position Statement No. 3 indicates that the EPA intends to use IBRA as the largest unit for decision-making in relation to maintenance of biodiversity. Proponents will, as a minimum, be required to demonstrate that their proposal can meet objectives which are framed in the context of conservation within the applicable bioregion/s. In some areas, such as the Swan Coastal Plain, the developing framework of biogeographical knowledge and policy may provide a more detailed context (EPA Guidance Statement No. 10 and Government of Western Australia 2000a and b).

4.2 Duration and Review

The duration of this Guidance Statement is for five years, unless circumstances require it to be reviewed earlier.

5 RESPONSIBILITIES

5.1 Environmental Protection Authority responsibilities

The EPA will apply this Guidance Statement when assessing any proposals, planning schemes or amendments where fauna and/or faunal assemblages are identified as relevant factors prior to, or during, the assessment.

5.2 Department of Environment responsibilities

The DoE, through the EPA Service Unit (EPASU), will assist the EPA in applying this Guidance Statement in environmental impact assessment and in conducting its functions under Part IV of the EP Act.

The DoE, through the EPASU, will provide more specific advice to proponents and environmental consultants, as required, in relation to detailed interpretation of aspects of this Guidance or in relation to specific assessments, within available resources.

5.3 Proponent responsibilities

Assessment is likely to be assisted if proponents demonstrate to the EPA that the requirements of this Guidance Statement are incorporated into proposals.

As outlined in Section 3.3.5, the EPA expects that proponents will ensure that the findings of the original survey report/s appear in an unaltered form in the main text of any review document, and that a copy of the whole survey report will appear as an appendix of the review document.

5.4 Environmental practitioner (including fauna consultant) responsibilities

The EPA expects that the design of fauna and faunal assemblage surveys will take account of current fauna protection legislation and that survey practitioners will have appropriate CALM administered licences and will comply with current animal ethics requirements.

Environmental practitioners are expected to exercise due professional diligence in the conduct of fauna and faunal assemblage surveys and the authorship of fauna and faunal assemblage survey reports. Environmental review documents and fauna and faunal assemblage survey reports should contain an acknowledgment that the EPA's EIA process is one of the specific purposes for which the document or report has been prepared and that the document is suitable for this purpose. Documents and/or reports that do not do so will not be accepted by the EPA for the purposes of EIA.

It is essential that the standards for survey outlined here are met or exceeded. The EPA urges practitioners to ensure that they fully understand the inherent context and level of meaning of terms before they apply them. Particular use should be made of definitions in this Guidance.

A full and frank statement of impacts is expected at all levels of survey and environmental assessment documentation.

6 DEFINITIONS AND ACRONYMS

6.1 Definitions

Biological diversity/biodiversity – is the variety of all life forms - the different plants, animals and micro-organisms, the genes they contain, and the ecosystems of which they form a part. It is not static, but constantly changing; it is increased by genetic change and evolutionary processes and reduced by processes such as habitat degradation, population decline, and extinction (Commonwealth of Australia 1996).

Biodiversity has two key aspects:

- its intrinsic value at the genetic, individual species, and species assemblages levels; and
- its functional value at the ecosystem level.

Two different species assemblages may have different *intrinsic* values but may still have the same *functional* value in terms of the part they play in maintaining ecosystem processes.

o **Genetic diversity** – is the variety of genetic information contained in all of the individual plants, animals and micro-organisms that inhabit the earth (Commonwealth of Australia 1996). Genetic Diversity represents the heritable variation within and between populations of organisms. In any given area it is the variety of genetic material contained in all organisms.

Genetic diversity occurs within and between the populations of organisms that comprise individual species as well as among species (Commonwealth of Australia 1996).

Due to a lack of research regarding the genetic range of endemic species, there has been, and will continue to be, difficulty in addressing protection of biodiversity specifically at the genetic level.

However for many species some information is available on the phenotypic expression of genetic variation through the recognition of different taxa at the sub-species or variety level. These may be significant in terms of exhibiting varying distribution and levels of rarity. The protection of species throughout their range and on the variety of sites may therefore serve as a surrogate for protection of genetic diversity in the absence of specific information. This issue needs to be considered in the design/collection and interpretation of data obtained in fauna and faunal assemblage surveys.

o **Species diversity** – this can be considered as the variety of individual species within a given area, such as a region. While such diversity can be

measured in many ways, the number of species (species richness) is most often used, but a more precise measurement taxonomic diversity, also considers the relationship of species to each other. The more different a species is from other species the greater its contribution to any overall measure of biological diversity. The ecological importance of a species can have a direct effect on community structure, and thus on overall biodiversity. The variety of species increases with genetic change and evolutionary processes.

Species diversity is conceptually different from genetic diversity because:

- in general, the recognition of species is based on physical features (a taxonomic approach of recognising, describing, naming and classifying); and
- a species is a concept, rather than a clear unit in nature. This can mean that the amount of genetic variation within one species may be markedly different from another species. To accommodate such inconsistencies, sub-divisions such as sub-species and hybrids may be recognised.

EIA in WA to date has typically considered fauna at the species and species assemblage levels. For example, environmental assessment work presented to the EPA typically includes fauna inventory lists with an emphasis on the presence or absence of rare, Threatened and Priority species (as determined by CALM databases or other relevant data sources).

Threatened and Priority fauna are only one subset of species diversity. The scope of formal listings is limited by the extent and intensity of sampling in any area, by how well a surveyor recognises all different organisms in an area, by whether all known occurrences are registered, and by the current progress in naming species groups. Since these processes are ongoing, it is clear that survey for environmental impact assessment has a role in extending knowledge. Consequently, consultants are encouraged to check specimens that have no known match, or appear anomalous, and which may be new.

o **Ecosystem diversity** – in any given area, the variety of habitats, biotic communities and ecological processes (Commonwealth of Australia 1996).

Ecosystems are the basic functional ecological units. They comprise the diversity of all-living organisms and non-living components and their relationships within a given area. They can be defined at almost any nominated scale. Ecosystems include abiotic components, which include physical factors such as radiation, gases, the water cycle, geology, land and soil forming processes, and climate.

Ecological processes are the interactions, and changes or development processes, of the ecosystem over time.

Ecosystem diversity is harder to measure than species or genetic diversity because the boundaries of ecosystems (or component habitats and communities) are a matter of definition within a matrix. Provided a consistent set of criteria is used to define ecosystems, their number and distribution can be measured. It is therefore essential

that scale/s and the basis for differentiation are defined and understood in any treatment of ecosystem diversity.

o **Other expressions of biodiversity** - Other expressions of biodiversity can be important. These include the relative abundance of species, the age structure of populations, the pattern of communities in a region, changes in community composition and structure over time, and ecological processes such as predation, parasitism and mutualism. It is often important to examine diversity in ecosystem structure and function as well as compositional diversity of genes, species and ecosystems (Environmental Protection Authority 2002).

Environmental assessment and evaluation document (sometimes referred to as an **environmental review document**) – An environmental assessment and evaluation document is the information presented in an environmental assessment or review document submitted to the EPA. Environmental assessment or review documents may include:

- a referral document (prior to the EPA determining the level of environmental assessment required for a proposal);
- an environmental review document (as required by the EPA for formal assessments of some proposals and schemes, under Part IV of the Environmental Protection Act); or
- a post-approval report (i.e. prepared subsequent to environmental approval being granted) such as reports on fauna and faunal assemblage surveys conducted to fulfil proponent commitments or environmental conditions.

The information provided in an environmental assessment and evaluation may (where relevant) make reference to one or more fauna and faunal assemblage survey reports (as well as information relevant to other impacts of the proposal). It may also include an evaluation of the impacts of a proposal, drawing information from the fauna and faunal assemblage survey (and other) report/s that should always be made available to the DoE and the EPA either separately or as an appendix to the environmental review document.

Faunal assemblage - A collection of animal species inhabiting a particular area.

Fauna and faunal assemblage survey - For the purposes of EIA or environmental management, a fauna and faunal assemblage survey is the primary office and field based investigation (including a review of established literature) of the characteristics of the faunal biodiversity of a proposal or scheme area or any other area relevant to the consideration or assessment of a proposal or scheme by the EPA or the management of a proposal or scheme.

Fauna and faunal assemblage survey report - A fauna and faunal assemblage survey report describes the objectives, methods, data results, analysis and conclusions of a fauna and faunal assemblage survey. The primary author/s of this document should be the person/s conducting the fauna and faunal assemblage

survey. This report should be separate from an environmental assessment and evaluation report (described above).

Habitat - The natural environment of an organism or a community, including all biotic and abiotic elements; a suitable place for it to live (after Gilpin 1996; Jones *et al.* 1990; Lewis 1977; Onions 1978; Commonwealth of Australia 1996). The term 'habitat' has been applied at a range of scales in general use (as have community and vegetation). Vegetation can become a reasonable surrogate for outlining habitat when its main components, structure and the associated landform are also described.

Natural Areas - naturally vegetated area or non-vegetated areas such as water bodies (generally rivers, lakes and estuaries), bare ground (generally sand or mud) and rock outcrops (Environmental Protection Authority 2003b).

Priority Fauna - Conservation significant animal species listed by CALM's Threatened Species Consultative Committee but which are not currently listed under Section 14 (2) (ba) of the Wildlife Conservation Act 1950 as Specially Protected Fauna.

Proposal area - Any area or portion of the environment including aquatic areas and affected portions of the atmosphere potentially impacted upon by a proposal or scheme area being considered by the EPA.

Short-range endemics - A species with a naturally small distribution covering less than 10,000 km^2, although the actual area of occupancy may be far less (Harvey 2002).

Significant fauna - Species may be significant for a range of reasons other than those protected by international agreement or treaty, Specially Protected or Priority Fauna. Significant fauna may include short-range endemic species, species that have declining populations or declining distributions, species at the extremes of their range, or isolated outlying populations, or species which may be undescribed.

Significant fauna assemblage – Relatively intact examples of naturally occurring fauna assemblages or large populations representing a significant proportion of the local to regional total population of a species. [Note: significant fauna values are distinct from values for significant fauna species].

Species - A group of biological entities that interbreed to produce fertile offspring or possess common characteristics derived from a common gene pool. *(EPBC Act).*

Specially Protected Fauna - Animal species listed under Section 14 (2) (ba) of the Wildlife Conservation Act 1950. The latest listing is Wildlife Conservation (Specially Protected Fauna) Notice 2002 (Government of Western Australia

2002).

System 6 areas - Those specific localities as listed in The Darling System - System 6 Part II Recommendations for Specific Localities Report 13 Conservation Reserves for Western Australia as recommended by the Environmental Protection Authority (Department of Conservation and Environment 1983).

Taxa (singular **Taxon)** - A taxonomic group. Depending on context this may be a subspecies, species, genus or higher taxonomic grouping.

Terrestrial fauna - Animal species living in or on land. For the purpose of this Guidance Statement freshwater vertebrates including fish and amphibians and aerial species are included. (Note: marine and subterranean fauna (troglodytic and stygofauna, see Section 1.2.4.2) are not included in this Guidance Statement.)

Vegetation (compare with flora; and see significant vegetation) - The various combinations that all populations of all vascular plant species form within a given area, and the nature and extent of each combination (after Mueller-Dombois and Ellenberg 1974; Collocott and Dobson 1975; Lewis 1977; Onions 1978; Delbridge 1987). Note that this is a biodiversity approach, and that other approaches may be based on structure or appearance - approaches that describe lesser subsets of plant diversity. The term vegetation has been applied at a range of scales in general use (as have community and habitat). The joint influence of different approaches and levels that can be applied to vegetation has led to a range of terms which describe vegetation, with resulting confusion.

6.2 Acronyms

ANZECC	Australian New Zealand Environment and Conservation Council
CALM	Department of Conservation and Land Management
CAMBA	China-Australia Migratory Bird Agreement (the Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment)
DoE	Department of Environment (formerly Department of Environmental Protection
EIA	Environmental Impact Assessment
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986*
EPA SU	Environmental Protection Authority Service Unit
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
GIS	Geographic Information System
IBRA	Interim Biogeographic Regionalisation of Australia

JAMBA	Japan-Australia Migratory Bird Agreement (the Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment)
SoE	State of the Environment

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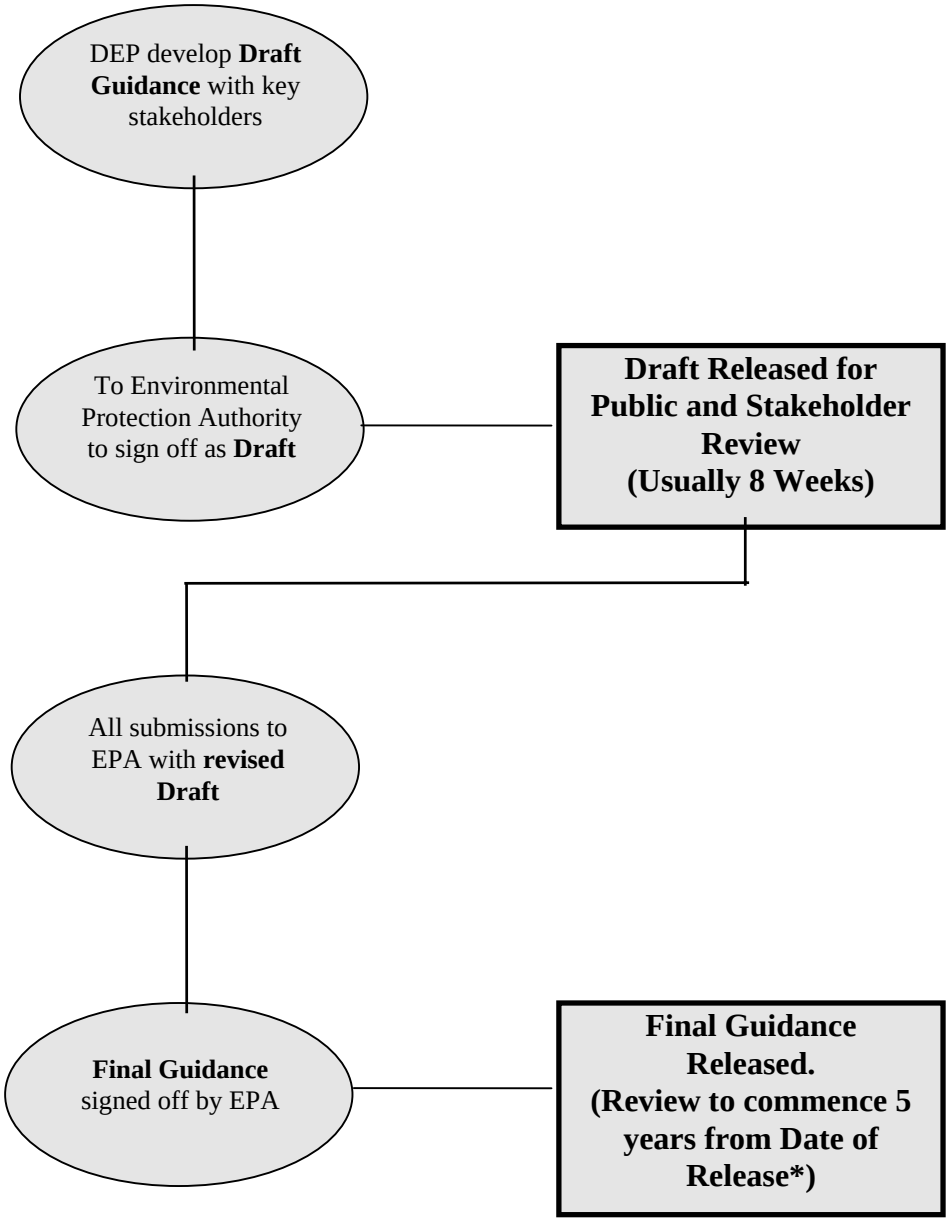
Appendix 1

GENERIC FLOW DIAGRAM FOR THE GUIDANCE STATEMENT PROCESS



* Guidance may be reviewed earlier if circumstances require it.

Appendix 2
GUIDE TO LEVELS OF TERRESTRIAL FAUNA AND FAUNA ASSEMBLAGE SURVEY

Table 1: Levels of Terrestrial Fauna and Faunal Assemblage survey
(adapted from EPA Position Statement No. 3)

Survey levels differ in the capacity of the survey work to provide detail of the conservation and functional values of the target area and its immediate context.	
Level 1 Surveys	**Background research or 'desktop' study** The purpose is to gather background information on the target area (usually at the locality scale). This involves a search of all sources for literature, data and map-based information. **Reconnaissance survey** The purposes are: i) to verify the accuracy of the background study; ii) to further delineate and characterise the fauna and faunal assemblages present in the target area; and iii) to identify potential impacts. This involves a target area visit by suitably qualified personnel to undertake selective, low intensity sampling of the fauna and faunal assemblages, and to provide habitat descriptions and habitat maps of the project area.
Level 2 Surveys	Incorporates **Background research** and **Reconnaissance survey** as preparation for more intensive survey that may range in form between detailed and comprehensive survey. **Detailed survey** The purpose is to enhance the level of knowledge at the locality scale. This applies where the general context is better known. This involves: i) one or more visit/s in each season appropriate to the bioregion and the faunal group being surveyed. Generally maximum survey will be the season that follows the season of maximum rainfall but there will be need to time surveys according to seasonal activity patterns of some faunal groups (e.g. molluscs or amphibians). **Comprehensive survey** The purpose is to enhance the level of knowledge at the locality scale and the context at the local scale. In some cases sub-region survey may be required to provide wider context. This applies where there is only broad general context. This involves survey, at the intensity applied in detailed survey, of both the locality and parts of the local area. Such work is likely to be more structured with longer-term study and multiple visits.

Table 2: Indicative levels of terrestrial fauna and faunal assemblage survey expected by the EPA in relation to the scale and nature of impact of proposals and the sensitivity of the receiving environment

(adapted from EPA Position Statement No. 3)

The bioregions have been grouped in Table 2 according to the existing degree of regional modification or loss of biodiversity, degree of threat and sensitivity to further loss. As a guide to the use of this table, it is very important to note that there will be areas of greater sensitivity within each bioregion that will require special consideration (e.g. wetlands, threatened ecological communities, restricted geomorphological/soil type areas with the likelihood of presence of short-range endemic species including unnamed species, areas with Specially Protected Fauna or Priority species, etc.). Conversely, for areas with a high degree of pre-existing modification and reduced native fauna species (such as cleared agricultural land) the investigation effort expected is likely to be reduced in comparison to areas that are likely to support fauna in native vegetation.

Sensitivity of Environment (Bioregion Groups)	**Numbers indicate level of terrestrial fauna and faunal assemblage survey expected (as defined in Table 1)**		
	Scale and Nature of Impact		
	High	**Moderate**	**Low**
Group 1	2	2	1
Groups 2 and 3	2	1 or 2	1
Group 4	2	1	1

Bioregion Groups

- **Group 1: Warren, Avon Wheatbelt, Geraldton Sandplains, Esperance Plains, Mallee, Swan Coastal Plain** (bioregions of the South-West Botanical Province that are extensively cleared for agriculture).
- **Group 2: Gascoyne, Carnarvon, Yalgoo, Pilbara, Coolgardie, Murchison, Nullarbor, Hampton,** (bioregions of the Eremaean Botanical Province, native vegetation is largely contiguous but used for commercial grazing) **and Jarrah Forest** (this South-West Botanical Province bioregion is included here because the native vegetation remains extensive and largely contiguous but is used as a commercial forestry resource).
- **Group 3: Dampierland, Northern Kimberley, Central Kimberley, Ord-Victoria Plains, Victoria-Bonaparte** (bioregions of the Northern Botanical Province, native vegetation is largely contiguous but is used for commercial grazing).
- **Group 4: Great Sandy Desert, Gibson Desert, Great-Victoria Desert, Little Sandy Desert, Central Ranges, Tanami** (bioregions of the Eremaean Botanical Province, native vegetation is largely contiguous but is generally not used for commercial grazing).

Table 3: Consideration of the characteristics of proposal areas in defining the scale and nature of impacts on biodiversity

(to be used in conjunction with Tables 1 and 2 to provide guidance on the level of fauna and faunal assemblage survey required for a proposal)

SITUATION I: The area and its immediate surrounds are unlikely to support populations of native fauna.	
The area of the proposal and adjacent areas that could be impacted by off site impacts from the proposal **do not** support native faunal populations in natural areas.	**This Guidance Statement is not applicable** It is not expected that the proposal will need to address fauna or faunal assemblage factors. Any proposal submitted to the EPA for assessment of other environmental factors should include comprehensive photographs of the area suitable for identifying the nature and condition of any vegetation and habitats in the area. Depending on the area and nature of the development it may be appropriate to consider some strategic habitat revegetation or landscaping to enhance faunal linkages with local provenance native plant species to re-establish them in the area.

SITUATION II: The area and/or its immediate surrounds are likely to support populations of native fauna.	
If there is native fauna in habitats in or adjacent to the proposal area that could be impacted then background research and reconnaissance survey is required as a minimum. Areas that could be impacted support native fauna in vegetation that is not completely degraded. **Note: if the area supports native vegetation within a national park, nature reserve, conservation park, or other reserve formally protected or recommended for protection for a conservation purpose a comprehensive survey is required as a minimum.**	**This Guidance Statement is applicable.** This Table provides guidance as to the level of fauna and faunal assemblage survey expected.

AREA CHARACTERISTICS	EXPLANATION OF SIGNIFICANCE	SCALE AND NATURE OF IMPACT		
		HIGH	MODERATE	LOW
Degree of habitat degradation or clearing within region				
Determine the level of alteration of the original vegetation. The extent of clearing in the district and bioregion is the simplest measure of change and of sensitivity to further change. However, less obvious factors can be measured that have also altered the vegetation and consequently the fauna habitat. Examples in the Eremaean Province include change in faunal assemblages as a consequence of vegetation degradation resulting from grazing, and associated invasion of introduced species, especially predators and competitors.	This is a background factor in any region, with some regions having significantly higher cumulative degradation than others.	In either the local area or region: i) in fragmented ecosystems with less than 30% native vegetation or natural areas remaining; or ii) in more extensive ecosystems with less than 30% of vegetation in better condition.	In either the local area or region: i) in fragmented ecosystems with between 30-50% native vegetation or natural areas remaining; or ii) in more extensive ecosystems with between 30-50% of vegetation in better condition.	In either the local area or region: i) in fragmented ecosystems with more than 50% native vegetation or natural areas remaining; or ii) in more extensive ecosystems with more than 50% of vegetation in better condition.
Size/scale of proposal/impact				
The size of impact is important in determining the environmental significance of the proposal. This characteristic is not intended to imply relative natural values of bioregions. Rather it reflects the relative degree of disturbance in each group of bioregions.	Area of clearing/loss of habitat and native fauna as a result of the proposal.	>10 ha - Bioregion Group 1 >50 ha - Bioregion Groups 2-3 >75 ha - Bioregion Group 4	1-10ha - Bioregion Group 1 10-50ha - Bioregion Groups 2-3 20-75ha - Bioregion Group 4	<1ha - Bioregion Group 1 <10ha - Bioregion Groups 2-3 <20ha - Bioregion Group 4

AREA CHARACTERISTICS	EXPLANATION OF SIGNIFICANCE	SCALE AND NATURE OF IMPACT		
		HIGH	MODERATE	LOW
Rarity of vegetation and landforms				
Consider whether the proposal impacts on habitats in vegetation or landform units that are restricted or rare either naturally or as a result of clearing. Threatened Ecological Communities (TEC's) may fit either of these categories.	Impact on **any** naturally rare or restricted habitat and its component fauna is considered a high to moderate impact. Restricted distribution landform units such as Banded Ironstone Hills, areas with granite outcrops (e.g. in the Coolgardie/Yalgoo Bioregion), or areas with specialised faunal habitats such as Salmon Gum/York Gum woodlands that provide breeding resources for obligate tree hollow breeding species (in the Avon Wheatbelt Bioregion) and regionally rare wetlands may be important rare habitats.	Vegetation and landforms that: i) naturally comprises less than 5% in the local area (15 km radius) or the bioregion; or ii) is a Threatened Ecological Community.	Vegetation and landforms that naturally occupy from 5 to 10% of the local area (15 km radius) or the bioregion.	Vegetation and landforms that are naturally more widespread than 10% of local area (15 km radius) and the bioregion.
Significant Habitats				
Consider whether the area supports habitats that have particular significance for ecological reasons. For example, important feeding or breeding areas or habitats for species protected under international agreements or treaties (e.g. RAMSAR wetlands, migrating birds), Specially Protected and/or Priority Fauna, and habitats for short-range endemic species.	Sites that provide important habitats supporting populations of species that are specially protected by law.	Significant habitats are known in the area or are found in the area during reconnaissance survey.	The vegetation and area characteristics indicate that significant habitats are likely to occur.	Significant habitats are not known from the area or found by reconnaissance survey.

AREA CHARACTERISTICS	EXPLANATION OF SIGNIFICANCE	SCALE AND NATURE OF IMPACT		
		HIGH	MODERATE	LOW
Refugia				
Consider whether the area serves as an ecological refuge for fauna species. These are more restricted environments that have been isolated for extended periods of time, or are the last remnants of such areas. They may be of high significance for fauna species or faunal assemblages with very restricted distributions, or support fauna species well outside their normal range. Examples include isolated hills (e.g. Banded Ironstone or Greenstone Formations or granite outcrops) which are remnants of an ancient eroding surface, islands, permanent wetlands in arid areas, permanent damplands in wetter regions which may retain Gondwanic elements, patches of ancient paleodrainage which have habitat that is not yet affected by secondary salinity as a result of clearing (especially in agricultural areas), mound springs, etc.	For Gondwanic values see Main 1996, Hopper *et al.* 1996, and Horwitz 1994. For short-range endemic values see Harvey (2002). Refuges may include taxa with preferences for stability/low seasonality, seclusion from fire, or for permanent water,or rainforest elements, with mesic features , or other derivatives that are now isolated (e.g. specific soil types).	Isolated, or disjunct fauna populations or faunal assemblages are known or are likely to be present. The presence of refuges indicates the potential impact is high.	The characteristics of the area indicate that it could serve as a refuge for some faunal groups.	Refugia are not known from the area or are not found by reconnaissance survey.

AREA CHARACTERISTICS	EXPLANATION OF SIGNIFICANCE	SCALE AND NATURE OF IMPACT		
		HIGH	MODERATE	LOW
Fauna protected under international agreements or treaties, Specially Protected or Priority Fauna				
Consider whether the area supports species protected by international agreement or treaty (JAMBA/CAMBA), Specially Protected and/or Priority Fauna.	Areas support populations of statutory protected species.	i) Species protected by international agreement or treaty (JAMBA/CAMBA), or Specially Protected Fauna are found in the area or in similar habitats in its immediate vicinity during reconnaissance survey; and/or ii) habitat characteristics indicate that species protected by international agreement or treaty (JAMBA/CAMBA), or Specially Protected Fauna species may occur. The presence of several Priority Fauna species may also raise the impact to high.	i) Priority Fauna species are found in the area or in similar habitats in its immediate vicinity during reconnaissance survey; and/or ii) the habitat and area characteristics indicate that Priority Fauna species may occur. Cumulative impact on the total number of populations should be considered.	Specially Protected and/or Priority Fauna species are not found by reconnaissance survey, and are not likely to be found in the area or its immediate vicinity, on the basis of existing information. Generally the area would be well known from one, and ideally more than one, well-timed and structured survey.

AREA CHARACTERISTICS	EXPLANATION OF SIGNIFICANCE	SCALE AND NATURE OF IMPACT		
		HIGH	MODERATE	LOW
Other significant fauna or fauna assemblages				
Consider whether the area supports fauna or fauna assemblages that have particular significance for ecological reasons and/or large populations/ seasonal concentrations of particular species. N.B. If the area is known to support large populations from previous adequate surveys this could be used to assess the significance of the portion of the habitat within the proposal area.	The faunal assemblage may be relatively intact compared to other assemblages in the region and may contain species that have declining populations or declining distributions. The area may support species at the extremes of their range, or isolated outlying populations; or species with anomalous features, which may be undescribed.	Relatively intact faunal assemblages are known or are highly likely to be present. The area is known to support a large population/seasonal concentration of species.	Significant species or taxa are found or likely to be found in the area or in similar habitat in its immediate vicinity.	Significant species or taxa are not found or likely to be found in the area or in similar habitat in its immediate vicinity.
Size of remnant and condition/intactness of habitat and faunal assemblage				
Determine whether the proposal impacts on a relatively large more or less intact remnant (e.g. Bioregion Group 1) or is an area of more or less intact habitat in areas of extensively degraded landscapes (e.g. Bioregion Groups 2 and 3) and is likely to support a relatively intact faunal assemblage.	Large intact remnants are key biodiversity reservoirs in fragmented environments. In some cases even small, but intact, remnants may be highly significant because they support a relatively intact faunal assemblage. Areas of relatively intact habitat in regions/districts where the habitat is generally in poorer condition are also important for retention of biodiversity. Desktop study should seek to determine the size of remnants and/or habitat condition relative to those in the local surrounds (≥15km radius).	Area is a relatively large compact remnant, or part of a large compact remnant in a district where habitats are fragmented by clearing and/or other degradation; or an area of habitat, which is more intact than typical for the local district or bioregion.	Area supports a remnant of less than average size and degree of intactness in the district; or the habitat and faunal assemblage is not more intact than that in the district.	Area is not in a fragmented environment or an environment with extensive areas of otherwise degraded habitats or faunal assemblages, such as some rangeland environments.

AREA CHARACTERISTICS	EXPLANATION OF SIGNIFICANCE	SCALE AND NATURE OF IMPACT		
		HIGH	MODERATE	LOW
Ecological Linkage				
Determine the ecological linkage role of the area in the local and regional context.	Ecological linkages have important biodiversity conservation roles, therefore the values of these roles are highly sensitive to change.	The area is part of an ecological linkage at the regional or local scale. Should also survey the bushland areas connected by the linkage to determine fauna species and populations maintained by the linkage.	The area is not directly connected to adjoining areas but is part of a minor ecological linkage.	The area is isolated with no ecological linkages.
Heterogeneity or complexity of the habitat and faunal assemblage				
Determine the characteristics of habitats relative to those in the local surrounds through desktop and reconnaissance surveys.	The relative complexity of the area is expressed by the range of landforms/habitats/ecotones offering a diversity of seasonal resources for fauna populations and faunal assemblages.	The area and/or its immediate surrounds are complex, with a wider range of habitats and ecotones and faunal assemblages relative to the character of the local and regional surrounds.	The area and/or its immediate surrounds have a similar range of habitats and faunal assemblages relative to the characteristics at the local and regional scale.	The area and its immediate surrounds are less complex relative to the characteristics of the local and regional scale.

Environmental Protection Authority

Guidance for the Assessment of Environmental Factors

(in accordance with the Environmental Protection Act 1986)

Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia

No. 51

June 2004

Western Australia

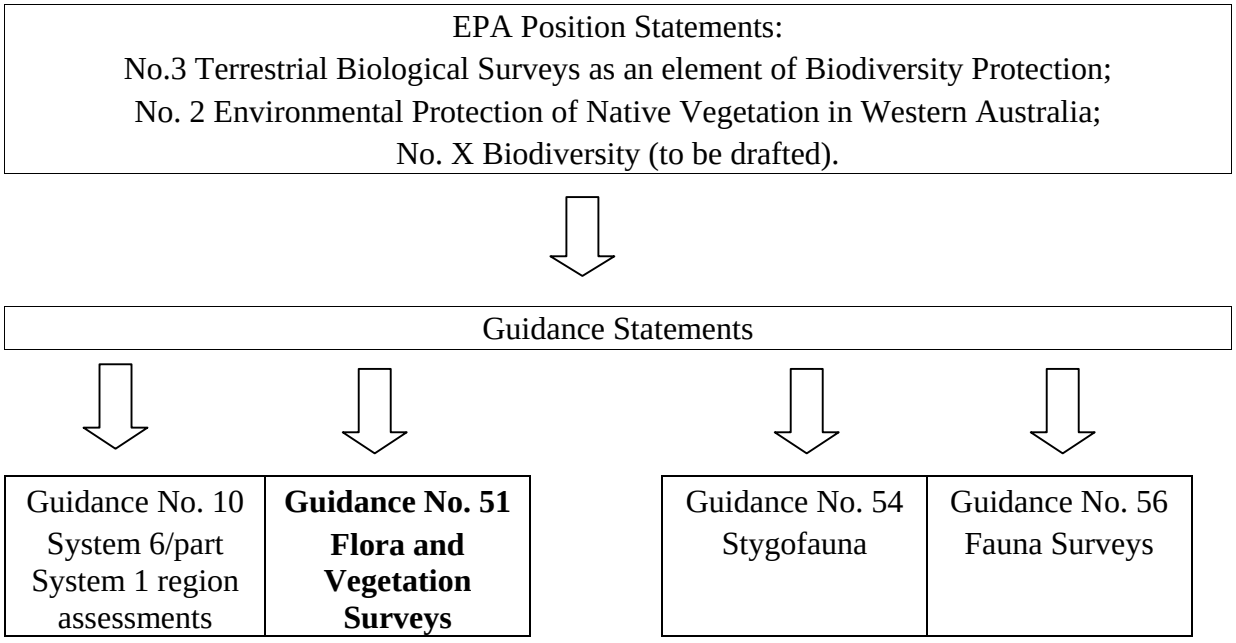
FOREWORD

The Environmental Protection Authority (EPA) is an independent statutory authority and is the key provider of independent environmental advice to Government.

The EPA's objectives are to protect the environment and to prevent, control and abate pollution and environmental harm. The EPA aims to achieve some of this through the development of environmental protection Guidance Statements for the environmental impact assessment (EIA) of proposals.

This document is one in a series being issued by the EPA to assist proponents, consultants and the public generally to gain additional information about the EPA's thinking in relation to aspects of the EIA process. The series provides the basis for EPA's evaluation of, and advice on, development proposals subject to EIA. The Guidance Statements are one part of assisting proponents in achieving an environmentally acceptable proposal. Consistent with the notion of continuous environmental improvement and adaptive environmental management, the EPA expects proponents to take all reasonable and practicable measures to protect the environment and to view the requirements of this Guidance as representing the minimum standards necessary to achieve an appropriate level of flora and vegetation survey for the assessment of environmental factors.

This Statement provides guidance on the standard of survey required to assist in collecting the appropriate data for decision-making associated with the protection of Western Australia's terrestrial flora and vegetation and their ecosystems. The flowchart below shows the relationship between Position Statements and this and other Guidance Statements.

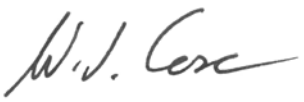


Whilst the EPA has provided this guidance to encourage best practice in flora and vegetation survey and reporting, it is conscious that the process has highlighted the need for complementary measures to promote such goals. In short, it is clear that the wider scientific community has a role to play in fostering skills and expertise. Firstly, the universities have a role to play in developing graduate skills in the areas of botany, taxonomy, biogeography, ecology and statistics, which are amongst the basic prerequisites in this line of endeavour. It is evident that there has been a shift away from these areas as society places more emphasis on areas such as biotechnology. Secondly, practising botanists and ecologists have a role to play, by mentoring recent graduates, and, perhaps most importantly, providing them with the opportunity to experience the breadth of the diversity at first hand. Thirdly, all practitioners have a role in developing a progressively better synthesis of the botany and ecology of the State. These matters are not specifically covered in this guidance.

While guidance is provided specifically in relation to the Western Australian *Environmental Protection Act, 1986*, proponents are reminded to ascertain any responsibilities they may have in regard to this issue under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*

This Guidance Statement has the status of "**Final**" which means it has been reviewed by stakeholders and the public. The EPA has signed off the Guidance Statement and published it although it will be updated regularly as new documents come to hand.

I am pleased to release this document which now supersedes the draft version.



Walter Cox
CHAIRMAN
ENVIRONMENTAL PROTECTION AUTHORITY

June 2004

Contents

Guidance Statement No. 51

Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia

Key Words: biodiversity, biological diversity, biological surveys, IBRA, terrestrial flora, vegetation, plant species assemblages, Declared Rare and Priority Flora, significant flora

1 INTRODUCTION

1.1 Purpose

The primary purpose of this Statement is to provide guidance and information on expected standards and protocols for terrestrial flora and vegetation surveys to environmental consultants and proponents. The generic process for the writing of Guidance Statements is set out in Appendix 1.

This Guidance should be used when preparing documentation for referral of proposals, planning schemes and their amendments to the EPA, as well as for formal assessment and audit.

This Guidance Statement:

- provides the general standards and a common framework for terrestrial flora and vegetation surveys for environmental impact assessment (EIA) in Western Australia, the quality and quantity of information that should be derived from these surveys, and the consequent analysis, interpretation and reporting; and
- is primarily directed at the subset of biodiversity contained in all terrestrial vascular plants.

This Guidance will assist in the interpretation and application of the general principles outlined in the EPA's Position Statement No. 3, *Terrestrial Biological Surveys as an Element of Biodiversity Protection,* and Position Statement No. 2, *Environmental Protection of Native Vegetation in Western Australia.*

The EPA aims to promote survey work that is uniform and of sufficient rigour to contribute to a more systematic inventory of the State's biodiversity. This will result in a consolidated and readily accessible system of environmental information.

1.2 Policy context

1.2.1 State legislation

1.2.1.1 Environmental Protection Amendment Act 2003

Clearing of native vegetation on all land, except for exempt purposes, will soon be subject to the permit process defined under the *Environmental Protection Amendment Act 2003* (Government of Western Australia 2003a) and administered by the Department of Environment (DoE). The Act was assented to by the Governor on 20 October 2003. However, the clearing provisions cannot be proclaimed until regulations are tabled in the Legislative Assembly. These regulations have undergone extensive consultation with stakeholders and it is anticipated that they will be tabled in Parliament in the autumn session of 2004. All clearing of native vegetation in the State will require a permit, unless it is for an exempt purpose (detailed in Schedule 6 of the Act and in regulations).

Permit applications will be assessed against principles contained in the Act which consider impacts on: biodiversity, fauna habitat, rare flora, threatened ecological communities, level of remnant vegetation representation, watercourses and wetlands, land degradation, conservation areas, surface water quality, groundwater quality, and potential for flooding.

1.2.1.2 Other legislation in Western Australia

A range of other legislation is relevant to biodiversity conservation in Western Australia. This includes the *Environmental Protection Act 1986* (EP Act), the *Conservation and Land Management Act 1984*, and, in particular, the *Wildlife Conservation Act 1950*.

The Government proposes to replace the *Wildlife Conservation Act 1950* with a new Biodiversity Conservation Act. The new Act will provide for the protection and restoration of biodiversity, and the sustainable use of native plants, animals and other organisms.

1.2.2 Requirements for assessments which are accredited under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

Under the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), proposed actions which have the potential to have a significant impact on a matter of national environmental significance must be referred to the Commonwealth Minister for the Environment for a decision as to whether assessment is required under the provisions of that Act.

Provision has been made within the EPBC Act for State authorities to be accredited to undertake environmental assessments, either jointly with or on behalf of the Commonwealth, so as to meet the requirements for assessment under that Act. The

related requirements and arrangements for this are discussed in the EPBC Act itself and in the provisions of bilateral agreements being negotiated between State and Commonwealth governments. A bilateral agreement between Western Australia and the Commonwealth has been signed and came into effect on 20 October 2003, the date the EP Act amendments were assented to in the Western Australian Parliament.

Assessments must adequately address the potential impact on matters of national environmental significance in order to comply with the provisions of the EP Act and be accredited under the EPBC Act.

1.2.3 National policy context

The State has committed to an agreed framework, principles and objectives for the protection of biodiversity with the adoption of the *National Strategy for Ecologically Sustainable Development* (Commonwealth of Australia 1992) and subsequently *The National Strategy for the Conservation of Australia's Biological Diversity* (Commonwealth of Australia 1996). Western Australia was the first State to become a signatory to the latter, which followed from Australia's ratification of the United Nations Convention on Biological Diversity. In 2001 Western Australia endorsed the *National Objectives and Targets for Biodiversity Conservation 2001-2005* (Commonwealth of Australia 2001).

The EPA intends to ensure that, as far as possible, development proposals in Western Australia are consistent with, or do not conflict with, these principles, objectives and targets.

State of the Environment (SoE) reporting is now a legislative requirement at the Commonwealth level and has been adopted by Western Australia. SoE reporting aids environmental decision-making and enables assessment of progress towards ecological sustainability. It is important that environmental impact assessment reflects and reports on the "core" environmental indicators developed for SoE reporting, some of which are biodiversity indicators (ANZECC 2000).

Accordingly, the EPA is seeking to improve the consistency and the standard of flora and vegetation surveys to ensure that decisions relating to protection of biodiversity are based on appropriate information that accords with agreements between the State and the Commonwealth. These include:

- an increased level of emphasis placed on the protection of native biodiversity;
- some changes to nomenclature and definition; and
- an increase in the quality and quantity of information that the EPA needs for EIA, in order to report and make recommendations that are based on clear and meaningful information.

1.2.4 Related policies of the Environmental Protection Authority

1.2.4.1 Position Statement No. 2 on the protection of native vegetation

Position Statement No. 2, *Environmental Protection of Native Vegetation in Western Australia* (EPA 2000), outlined EPA policy on the protection of native vegetation in Western Australia, particularly in the agricultural area. It identified basic elements that the EPA should consider when assessing proposals that impact on biological diversity. These include the following: comparison of all proposal options; avoidance of species and community extinctions; an expectation that implementing the proposal will not take a vegetation type below the "threshold level" of 30%; and that proponents should demonstrate that on- and off-site impacts can be managed.

1.2.4.2 Position Statement No. 3 on terrestrial biological surveys

In March 2002, the EPA published Position Statement No. 3 entitled *Terrestrial Biological Surveys as an Element of Biodiversity Protection.* In that document the EPA discussed the range of International, National and State agreements and policies currently influencing the future protection of biodiversity in Western Australia and the need to review and improve the quality and quantity of information required for EIA.

Position Statement No. 3 indicated that the EPA adopted the definition of Biological Diversity and the Principles as defined in the *National Strategy for the Conservation of Australia's Biological Diversity* (Commonwealth of Australia 1996); that the quality of information and scope of field surveys should meet standards, requirements and protocols as determined and published by the EPA; and the Interim Biogeographic Regionalisation of Australia (IBRA) should be used as the largest unit for EIA decision-making in relation to the conservation of biodiversity. The IBRA has identified 26 bioregions in the State (Figure 1) which are affected by a range of different threatening processes and have varying levels of sensitivity to impact. Terrestrial biological surveys should provide sufficient information to address both biodiversity conservation and ecological function values within the context of proposals and the results of surveys should be publicly available.

Following a workshop in July 2000 on the draft Position Statement No. 3, the EPA decided that because of the diversity of ecosystems, separate guidance statements were warranted to address the range and complexity of issues pertaining to biological surveys.

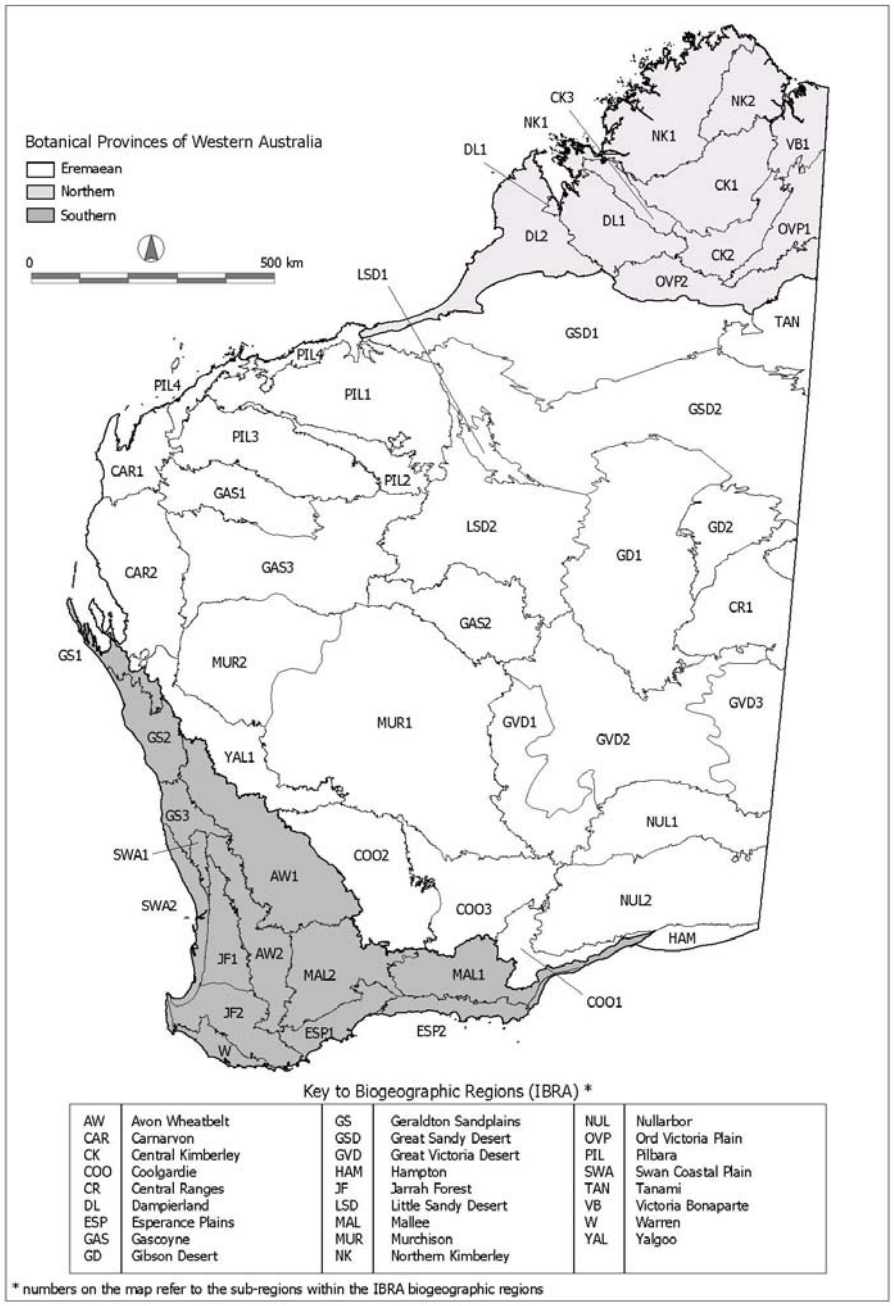


Figure 1: A Map of Western Australia showing the Botanical Provinces[1] (after Beard 1980), the IBRA bioregions (Environment Australia 2000) and the IBRA subregions (McKenzie et al. 2000).

[1] The Coolgardie and Yalgoo bioregions are here placed in the Eremaean Botanical Province (see Section 2.3). However, while their biotic composition is intermediate between the Eremaean and the South-West Provinces they are more closely allied with the South-West Province (GJ Keighery pers. comm. 2004).

Issues and survey types under consideration for incorporation in a series of guidance statements related to terrestrial biological surveys include:

- terrestrial flora and vegetation surveys (this Guidance);
- terrestrial fauna surveys (Guidance 56);
- subterranean fauna in groundwater and caves (Guidance 54);
- karst environments;
- data acquisition and submission; and
- threatening processes.

Therefore this Guidance Statement forms part of a series in response to Position Statement No. 3, and is intended to be read in conjunction with that document and other guidance statements that form part of the series.

1.3 Limitations of this guidance

This Guidance Statement is:

- confined to matters relating to flora and vegetation survey for EIA, and the treatment of associated data, and does not address more proposal-specific issues, which is the preserve of proposal-specific guidelines or approved scoping documents;
- the contemporary view of the EPA until such time as this document is subject to review;
- not an instrument for predicting outcomes of deliberations by the EPA; and
- intended to apply to proposals yet to come before the EPA.

2 DIVERSITY OF THE FLORA AND VEGETATION

2.1 The high diversity and endemism of the flora and vegetation

Flora

Australia's biota is one of the top 12 most diverse in the world (Common and Norton 1992, Mummery and Hardy 1994). One of the key parts of this diversity is the terrestrial flora of the South-West (Myers 1990).

Western Australia has high diversity and endemism of vascular plants. The progressive total of known species was 9803 in the year 2000 (Table 3 in Paczkowska and Chapman 2000); this was nearly half the national total (Hopper 1996). Overall, about 62% of plant species are endemic to the State, particularly the South-West (Paczkowska and Chapman 2000). The South-West, for example, holds 75% of the world's triggerplants (James 1979), and all *Actinostrobus* species (Marchant *et al.* 1987). In the wider part of the State endemism is less, at about 30% (Hopper 1996).

Vegetation

The high flora diversity is reflected in the vegetation. The State's 26 IBRA bioregions have been divided into 52 natural sub-regions which contain many vegetation units. This reflects the large number of different plants in each sub-region, which may occur together in a range of distinct combinations and habitats (e.g. Lyons *et al.* 2000, Gibson *et al.* 1994 and Keighery *et al.* 2000).

Other patterns that are evident with respect to the diversity of the flora, and particularly the vegetation, include:

- marked change in species complement from place to place; most intense in species rich areas (Griffin *et al.* 1990);
- patchiness or mosaic patterns of distribution, which are linked to the ancient, decayed, landscape (Hopper *et al.* 1996);
- refuges, or outposts, where organisms that are poorly suited to the current environment persist in isolated pockets of still suitable habitat (Hopper *et al.* 1996).

2.2 Developing the state of knowledge of the flora and vegetation

Due to the high diversity and the large size of the State, the short history of investigation, and limits to investigative resources, knowledge of the flora and vegetation of the State is still developing. Knowledge of species and their distribution is still in an exploratory phase. Thus frameworks to help understand patterns in vegetation are also still being developed.

There has been a steady increase in the number of taxa collected, examined and placed into their family groups (Paczkowska and Chapman 2000). A major rise since the 1970's probably reflects more systematic flora and vegetation survey, and taxonomic study (Figure 2). As this trend has not yet plateaued, it is clear that all future surveys, including those for EIA, can play a role in improving our knowledge of plant diversity.

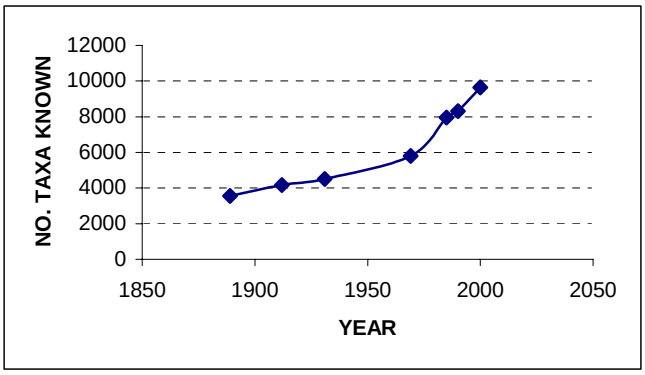


Figure 2: ***Historic rise in the number of vascular plant species found and recognized in Western Australia*** (from Paczkowska and Chapman 2000).
Note: Naturalised alien species are not part of the 1969 values.

The knowledge of the flora within bioregions is variable, and every bioregion (even the most studied) still has a suite of poorly known or recently found taxa.

2.3 Vegetation classification and mapping

The regionalisation of Western Australia based on vegetation and flora dates back to the 1860's with the recognition of south-western Australia's unique diversity and endemism by von Mueller 1867. In 1944 the state botanist, C. A. Gardner, used von Mueller's work, together with work by another German botanist (Diels 1906), to delineate three Botanical Provinces in Western Australia:

- the South-West Province, that is, south-western Australia;
- the Eremaean Province of the dry interior and coast; and
- the Northern Province in the tropical and semi-tropical north.

While both Diels and Gardner recognised districts within the provinces, subdivisions of the provinces are generally based on mapped vegetation types after Beard (1974-1981). Beard traversed the State to produce a series of maps, amalgamated at a broadscale (1:1 000 000). These mapping categories have been subdivided into sub-categories with associated text. Apart from the coarse scale of this mapping, there are other constraints in some sections of the State such as:

- there is generally only a summarised description of vegetation; and
- there have been changes to many plant names since Beard's publications.

Beard's mapping has remained the basis for the more recent regional maps: the National Land and Water Resources Audit (1998) vegetation maps and the natural regions identified in the IBRA project. Much of the base data set of the National Land and Water Resources Audit (1998) is at the broadscale, with some reference to a 1:250 000 scale for the South-West. This mapping, modified to reflect more recent information and unified across State borders, used the same underlying data as was utilised for delineating the IBRA natural regions in WA. However, the IBRA natural regions took into account geology, vegetation, flora and fauna.

The extent to which vegetation has been examined and categorised and/or mapped at finer scales in each of the three Botanical Provinces and/or regions is highly variable. In general, the most detailed approaches are linked to specific projects, and have very localised, scattered and limited coverage. In a few areas, such as regions in the South-West Province, there is better coverage at intermediate to broad levels of detail.

For example, mapping at scales in the vicinity of 1:250 000 to 1:100 000 are Heddle *et al.* (1980) and Mattiske and Havel (1998). Examples of vegetation plot based classification include Gibson *et al*. (1994), Department of Environmental Protection (1996), Markey (1997) and Keighery *et al.* (2000).

At State and regional levels there has been a mixed application of approaches to vegetation classification and mapping based on landform, species composition and vegetation structure. This mix of approaches has been recognised across Australia with the development of the National Vegetation Information System (NVIS) framework (Executive Steering Committee for Australian Vegetation Information 2003). NVIS has been developed to work towards providing Australia-wide comparable and consistent data. Consultants should be aware of this and, where possible, information should be collected so that it is compatible with NVIS protocols. There have also been various approaches to vegetation classification and mapping at the site/locality scale. This variation consequently means that all work does not systematically contribute to the development of regional frameworks.

For the purposes of this Guidance, the Provinces, regions and subregions, as delineated in Figure 1, are recognised as the basis for regional comparisons. The limitations of the knowledge base in these regions, broadly outlined above, should be noted.

2.4 Diversity and ecological function

A broad consideration of the ecological processes that influence sites and their ecological functions is required; statutory lists of Declared Rare and Priority Flora are only a small sub-set of biodiversity. Proponents should ensure that flora and vegetation surveys provide sufficient information to address both biodiversity conservation and ecological function values within the context of the type of proposal being considered and the relevant EPA objectives for protection of the environment (Environmental Protection Authority 2002a). This will enable an assessment of impacts on the conservation values and status of the site in a regional and local context.

This will help ensure that components and interactions of ecosystems are more effectively considered, leading to improvements in decision making and outcomes that are more ecologically sustainable.

3 THE GUIDANCE

3.1 EPA's objectives and their application to environmental impact assessment

3.1.1 The environmental objectives

The objectives of this Guidance Statement are to ensure that:

- there is clarity for proponents on the scale of flora and vegetation survey appropriate for different areas (see 3.2.5);

- the flora and vegetation survey, analysis, interpretation and reporting undertaken for EIA is of a suitable quality and consistent methodology to enable the EPA to judge the impacts of proposals on flora and vegetation;
- the environment, in particular significant flora and vegetation biodiversity, is identified and protected;
- WA's knowledge base of flora and vegetation biodiversity and biogeography is developed and enhanced over time, (particularly at the local scale) to the benefit of future decision-making; and
- survey data are capable of underpinning long-term observation and measurement for later compliance and audit purposes (especially as this pertains to completion criteria for projects).

3.1.2 Environmental factors and EPA objectives for each factor

Section 44 of the EP Act requires the EPA to report to the Minister for the Environment on the environmental factors relevant to proposals and planning schemes which it formally assesses under Part IV of the Act. The environmental factors are described in the scoping document (for proposals under Section 38) or instructions (for Schemes and their amendments under Section 48A) for the required environmental review document. The EPA's objective for each environmental factor and the investigations that will be undertaken by the proponent (proposals) or is required of the responsible authority (schemes and their amendments) to evaluate whether these objectives can be achieved is also defined in the scoping document or instructions.

The initial identification of factors should be undertaken by the proponent during the preparation of referral and scoping documents, see Section 3.1.3.

3.1.3 Application of the guidance to environmental impact assessment

This Guidance will apply when preparing documentation for referral of proposals, planning schemes and their amendments to the EPA for formal assessment and audit where vegetation is likely to be impacted as a result of implementation. Additional or special requirements for individual projects may be identified in the scoping document or instructions or in other advice provided via correspondence with the proponent or the responsible authority. Scoping documents or instructions should normally be consistent with this Guidance. However, in certain circumstances there may be a need to vary requirements to suit the particular case, and this would be set out in the scoping document or instructions.

3.2 Planning and design of flora and vegetation surveys

All proposals, planning schemes and their amendments where vegetation will be impacted as a result of implementation of the proposal, scheme or amendment should report fully on natural values, potential impacts, cumulative impacts, and options to minimise impacts. Documentation should identify the degree to which

the advice and approach provided in this Guidance Statement has been followed. Divergence from these standards should be highlighted in sections dedicated to limitations, see Section 3.3.1.

The EPA has provided below, guidance on what needs to be considered when surveys are being undertaken to provide information about flora and vegetation surveys relevant to a proposal.

3.2.1 Approaches, resources and standards required

The State's flora and vegetation is vast, complex and only partially known, and appraisal of it is a highly technical and skilled process. Therefore it is expected that for flora and vegetation survey:

- there will be adequate provision of resources for the survey and documentation of the flora and vegetation. It is anticipated that resources will be commensurate with the complex nature of the subject and the scope of the task being undertaken. For the process as a whole it is expected that:
  - the intensity of sampling (the number of sites, their spacing, and their area) is attuned to the complexity of the flora and vegetation of the proposal;
  - adequate resources are directed to plant specimen processing, identification, and subsequent lodgement (including allowance for a possible lag due to demand on botanists from multiple surveys and the availability of taxonomic specialists); and
  - adequate resources are directed to data analysis, mapping and interpretation (including allowance for a lag due to demand on surveyors from multiple surveys);
- there will be a high degree of rigour in reporting, not only to describe current vegetation and flora, but also to facilitate subsequent EPA assessment and auditing; and
- there will be a requirement for standardisation of techniques and terminology. It is important that the survey methods are given minimum standards so that future work on the flora and vegetation is comparable.

3.2.2 Stage of proposal when surveys should be commissioned

For any proposal, the timing of fieldwork is critical to the whole process of survey and reporting on flora and vegetation. It is the first part of a process, and the natural fluctuation in seasonal rainfall often delays fieldwork. A significant lead-time is required as it may be necessary to undertake surveys at various times of the year depending on the nature of the communities and species in the subject area. Survey over multiple years may be required where a single year's data is not adequate to address the environmental factors.

There may also be a lag time due to appropriate botanical expertise being unavailable. Botanists who meet demands for surveys at optimal times from more than one source, are likely to generate a lag due to having to sequentially process sample material and data from each survey. Proponents should make allowance for

this lag in project planning, as it is a consequence of best practice. Consequently, the EPA urges proponents to commission flora and vegetation surveys as early as practicable in the planning/site selection phase of a development or scheme to avoid potential for delays in project approvals.

For environmental management, it is essential that flora and vegetation surveys have been conducted before monitoring or completion criteria are decided prior to topsoil movement, and before local seed provenance determination and collection are undertaken.

3.2.3 Who should lead and undertake flora and vegetation surveys

Flora and vegetation surveys should be coordinated and led by botanists who have had training, mentoring and experience in flora and vegetation survey. It is expected that they will have specific training and/or experience in ecology and taxonomy of the Australian flora and would normally have had a wide exposure to WA's flora and vegetation, preferably with knowledge and experience in the region being surveyed.

It is recognised that some surveys may be done by survey teams that include members with less experience. These members should be supervised and mentored by the specialists mentioned above. This is seen as useful in training new practitioners.

3.2.4 When flora and vegetation surveys should be conducted

In most cases, the timing of a flora and vegetation survey is the key to providing the EPA with adequate information so that it can effectively assess the related environmental factors. Appropriate timing ensures that the majority of the plant species in an area are flowering, fruiting and have foliage that allows identification. This is particularly important where ephemeral or cryptic species of interest may occur (e.g. geophytes, orchids).

In general, the primary flora and vegetation survey should be conducted following the season which normally contributes the most rainfall in the bioregion. The relevant windows of time for sampling are dictated by the bioregion and can be ascertained from the growth and reproductive responses of all species to climate.

Northern Province	Eremaean Province	South-West Province
Main rain in summer	Main rain sporadic	Main rain in winter

In order to sample the majority of the flora and vegetation, it will be necessary to time additional surveys:

- according to secondary peaks in rainfall and/or the flowering period for additional suites of species or significant flora or plant communities; and

- to take into account short-term climatic fluctuation (such as drought or deluge) on the number of species present at the time of sampling. In periods of below average rainfall, there may also be justification for supplementary sampling in succeeding years to compensate for low diversity recorded during a survey (especially of ephemerals). This will be highly desirable in cases where drought is prolonged, or there are unusual circumstances such as possible pockets of significant flora and vegetation, or in the absence of a range of species or significant flora that might normally be expected in the environment.

If the initial botanical survey is undertaken in non-optimal times, e.g. drought, supplementary surveys must be undertaken at optimal times.

For surveys conducted for formal environmental assessments, the scoping document or instructions may specify survey requirements. In other cases (such as where the survey is carried out prior to referral of a proposal) advice on significant flora or communities may be sought from relevant conservation agencies.

3.2.5 Determining the extent and level of survey required

The extent and level of flora and vegetation survey must ensure the information is sufficient for the EPA to assess potential impacts.

The scope of flora and vegetation survey may be set out in the EPA's scoping document or instructions. The scoping document or instructions should be consistent with this Guidance. In the absence of specific direction, the following steps should be addressed.

1) Extent
   The EPA encourages the early and comprehensive definition of the boundaries of the proposal. In terms of impacts this means considering the potential:
   a) zone of direct impacts which only affect the site or locality (e.g. clearing);
   b) zone of indirect impacts which spread from the site or locality (e.g. drainage, hydrological change, dust, weeds and pathogens); and
   c) zone of wider interest (e.g. alternative sites, the extent of vegetation).

   Each proposal will be expected to consider the following aspects of flora and vegetation.

   - Flora
     Significant taxa (usually species or their sub-divisions) should be considered at all scales. It is expected that advice will be sought from CALM and the relevant experts on significant taxa in the study area and the appropriate region. To adequately address significant taxa a comprehensive listing of flora is necessary.

- Vegetation
  Vegetation should be addressed below the regional to sub-regional scale, e.g. vegetation complexes, alliances and formations, and land systems. Mapping at the population or community level is preferable. However, in larger areas this may not be feasible.

The level of detail required for information on vegetation and flora for the wider zones of influence, under (b) and (c) above, will vary on a case by case basis. Much will depend on what information is already available and the level of risk and potential consequences of indirect impacts. However, in general, it is likely that information will be required at a similar scale as that for the locality, but at a decreasing level of intensity for zones (b) and (c). This information and mapping is particularly important where the zone of direct impact is a narrow linear shape, for example, a road, rail, powerline or pipeline easement.

When flora of interest are found, it is essential that surveys for these taxa extend on a local or regional basis (if data is not available) to facilitate a conservation assessment of the taxa and the potential impact of the proposal.

2) Level of Survey
A simplified outline indicating the levels of flora and vegetation survey expected is given in Appendix 2. Table 3 in Appendix 2 provides guidance on a range of characteristics that will influence the scale and nature of the impact. Appendix 2 is also intended to indicate issues that need to be considered during survey and reporting. It is not exhaustive, and practitioners may well find other ecological values that need to be assessed.

3) Review of Extent and Scope
In some cases the objective and scope of the flora and vegetation survey may need to be reviewed as a response to the findings of the initial stages of the investigation.

3.2.6 Determining survey sampling design and intensity

Sampling design and intensity needs to be considered at two levels: regional and area specific.

The EPA considers the IBRA regions or sub-regions as the most appropriate level for assessing regional significance. At times, these may be subdivided to take into account other natural and/or administrative boundaries.

In determining sampling design and intensity, the following need to be addressed:
- landform - scale, heterogeneity, rarity;
- habitat - scale, heterogeneity, rarity;
- vegetation structure, diversity and seasonality;

- potential for Declared Rare, Priority and other significant flora to occur, based on habitat analysis;
- results of reconnaissance investigations and preliminary sampling for the specific investigation (e.g. species/area curves, species and ecosystem diversity and heterogeneity); and
- information on adjacent areas, including herbarium records and previous surveys.

Some general trends evident in each of the three botanical provinces in Western Australia, which influence survey methodology, are illustrated here:

Northern Province	Eremaean Province	South-West Province
Main rain in summer	Main rain sporadic	Main rain in winter
Plant species at low/moderate densities	Plant species at low densities	Plant species at moderate/high densities

Survey methodology that includes point based sampling is preferable as the sample sites can be located on a map and used over time for standard locatable reference points. The minimum number of sample sites that would be expected per vegetation unit would be two (unless the unit is confined to a small area of about sample site size). Where a unit is widespread, there would need to be sampling at representative points throughout its range. Stratified transects and targeted sampling may also be appropriate.

Most importantly, the sampling design should be adequately explained and justified in the methods.

3.3 Presentation and reporting

3.3.1 Identifying the limitations of the survey

Every flora and vegetation survey report should contain a section describing the methods used and a sub-section identifying the limitations of these methods. The survey limitations are important and their influence on findings should be incorporated into the conclusions.

Listing survey limitations assists by:

- promoting consideration by the author of any:
  - factors which may have compromised results;
  - omissions from the survey; and
  - issues which could not be addressed within the survey scope;
- clearly signposting any compromising factors in a way that should indicate the capacity of the survey and its report to address issues; and
- providing insurance to the practitioner against being perceived to have made false claims.

Limitations may cover constraints such as:

- sources of information and availability of contextual information (i.e. pre-existing background versus new material);
- the scope (i.e. what life forms, etc., were sampled);
- proportion of flora collected and identified (based on sampling, timing and intensity);
- completeness and further work which might be needed (e.g. was the relevant area fully surveyed);
- mapping reliability;
- timing, weather, season, cycle;
- disturbances (fire, flood, accidental human intervention etc.);
- intensity (in retrospect, was the intensity adequate);
- resources;
- access problems; and
- experience levels (e.g. degree of expertise in plant identification to taxon level).

3.3.2 Requirements for data presentation

As far as possible, data collected should be presented in quantitative form. The information to support the key results should be in a stand-alone format, which would allow an appropriately qualified third party to evaluate them. Once these components are in place, the discussion and conclusions can be used to make more qualitative statements.

Requirements for data presentation include:

- location map/s which place the project in the regional and local context;
- Vegetation
  - a description of the vegetation units and their key component species referenced to specific sites described in a standardised format with a key to any codes used. GPS coordinates should be given for the sampling sites;
  - a map showing the vegetation units, preferably orthogonally corrected and with a scale bar. The map should show roads and tracks, the location of sampling sites and/or the degree to which the area was traversed;
  - a map of the vegetation condition (the condition rating should be referenced); and
  - data on each site location, characteristics, (e.g. landform, soil, geology) vegetation layer/s cover and height, dominant species cover and height and list of all species present.
- Flora
  - a species list by Family using the nomenclature of the WA Herbarium for known taxa. It is preferable that the list is in the form of a table indicating presence in vegetation types/plots. Conservation significant and introduced species should be indicated;
  - an estimate of what proportion of the total flora was found (given the coverage and the timing of sampling);

  - a description of Declared Rare and Priority Flora and/or significant flora, with an estimate of their numbers at the survey site, regional abundance and distribution. The data should be presented in a standard CALM Rare Flora Report Form to facilitate entry into the computerised database maintained by CALM;
  - the collection numbers of specimens vouchered in the WA Herbarium as part of the survey should be included in an appendix;
- consideration of disturbance, focussing on the number of native species compared to weed species, the proportion of native species present compared with that expected in an intact plant community of the same type and on the condition of the described units of vegetation;
- to define vegetation categories where the scope is large, in terms of number of vegetation types, area, and/or multiple locations, a form of multivariate analysis of the data is likely to be warranted. At intermediate scales, or in the absence of the resources for such analysis, a site/species matrix may be used to group sites on the basis of like suites of the most common/indicator species;
- multivariate analysis should include, as a minimum, presence/absence data, and perennial species;
- a table of the area of each vegetation type, the percentage affected by the project area (both at the locality and in the region), the categories of vegetation and their environmental values (which may include near pristine, unique, limited extent, extensively cleared, significant flora present); and
- general observations and other qualitative information on the site.

Data presented should be interpreted in a regional and local context. Biodiversity conservation includes all ecosystem components (biotic and abiotic) and their relationships. Understanding biotic and abiotic relationships is integral to the appraisal of ecosystem function.

3.3.3 Preparation of flora and vegetation survey reports

The person/s involved in planning and conducting the flora and vegetation survey should be responsible for preparing these reports. In some cases, there may be a need for quality endorsement by more experienced persons. However, as set out in Section 3.2.3, these persons should also be qualified to undertake surveys.

3.3.4 Setting the context for survey design and reporting

Aspects of ‘context’ will include, but not be limited to:

- review and appraisal of existing knowledge (including literature search, metadata search, CALM database searches to identify Threatened Ecological Communities, Declared Rare, Priority and significant flora that are known to occur in the vicinity);
- characteristics of the site at the international, national, State, regional, local level as appropriate;
- objective of the survey; and

- what specific areas of information will be investigated (e.g. biogeographical, landform, conservation status, threatening processes).

3.3.5 Format of survey reports and data

The findings of the survey should be submitted in two ways:

1) As a stand-alone report, which may also appear whole as an appendix of an environmental review document:
   - To the EPA
     In hard copy (including any original colour maps) and electronic form (with mapped data in a digital format)
   - To the public
     Available in hard copy from the proponent at a cost no greater than that of the main environmental review document (the specific location of Threatened and Priority flora may need to be removed from public documents. Such information disclosure is exempted under Freedom of Information legislation).
2) As an overview within the environmental review document
   A clear overview of survey findings on biodiversity, conservation values, and associated impacts should be included in the review document. It is imperative that the overview accurately and directly represents the discussion, conclusions, recommendations, summary and limitations of the survey report. The findings and impacts should also be evident in the summary and conclusions of the review document. The parts of the review document which refer to flora and vegetation should be an accurate representation of the survey report. Ensuring that this occurs is the responsibility of the review document author.

   The EPA encourages the flora and vegetation survey report author to present their results, discussion, conclusions, recommendations, summary and limitations in a form that can be transferred intact into the overview document.

3.3.6 Public availability of flora and vegetation survey reports submitted for EIA

The EP Act stipulates that the EPA [Section 39(1)(a)(b) and 39(5)] and proponents [Section 40 (2)(a)(4)(a)(b)] make information publicly available as part of the environmental review process.

The EPA considers that:

- the public availability of information on biodiversity is fundamental to the environmental review process and good decision making;
- all survey work on flora and vegetation should contribute to the sum total of knowledge for the State; and
- any disclaimer within an environmental review or survey document must recognise that the work is primarily for the purposes of environmental impact

assessment under the EP Act, is consequently publicly available, and is subject to the limitations outlined in the methods of the survey document.

The EP Act provides for particular and limited protections on confidential information [Section 39(2)(3)(a)(b)(4) and Section 120]. The *Freedom of Information Act 1992* also applies.

3.3.7 Use of terminology

Terminology should be clear and standardised, preferably using those terms listed in Section 6 of this Guidance. Vegetation categorisation tends to be the most variable area of terminology. When there is doubt about the application of vegetation terms, it is recommended that reference be made to absolute scales, densities, and extent of vegetation. When using the generic term "vegetation unit" it should be qualified to indicate whether each unit is fine-scale (intra-locality), intermediate-scale (locality or inter-locality) or broad-scale (local to region).

3.3.8 Acknowledgement of contributors and attribution of all sources of data

Scientific and technical documents should appropriately acknowledge all contributions and authorship (this includes Environmental Review documents). This is important to the process of properly valuing all work and promoting basic standards.

Flora and vegetation survey reports should list the names of all persons involved in the survey and the preparation of the report and briefly state their role. Acknowledgements should also extend to any other contributors including external expertise sought.

Other sources of data should be fully attributed and referenced to the original source. This includes metadata (including GIS), maps, figures and tables copied or adapted from other sources.

3.3.9 Record keeping for the purpose of audit

It is highly desirable that the source data from flora and vegetation surveys be maintained by the proponent (or the consultant on behalf of the proponent, but the responsibility for this is with the proponent) in a readily available format for a minimum period (7 years) following the survey so that:

- subsequent supplementary, time-sequence or monitoring surveys can be adequately designed;
- survey limitations are transparent to data users; and
- the surveys themselves are verifiable and auditable by a third party.

Accordingly, the base data collected in surveys (including details of sample timing, precise location, etc.) should be retained in the form originally collected, and electronically, for a minimum of 7 years after the survey is completed.

The EPA advises that there may be random audits of flora and vegetation surveys (and/or related reports). In some cases flora and vegetation survey reports (and related data) may be subject to peer review by an independent botanist.

3.4 The role of the surveyor in increasing biodiversity knowledge

As a result of the limited amount of detailed flora and vegetation survey data available for Western Australia, much of the flora survey work conducted is of an exploratory nature and there is significant potential for new discoveries or findings which may challenge conventional understanding of the distribution or abundance of flora and vegetation.

The EPA would expect that persons engaged in flora and vegetation surveys will act as scientific advocates and bring to the scientific, government and public arenas, new information arising from surveys.

In addition to Threatened and Priority Flora, other significant taxa should be highlighted in the survey report, vouchered in the State Herbarium and brought to the attention of relevant authorities (CALM, the EPA, etc.). These include plant specimens which are collected and not readily identifiable as common, or reflect taxonomic anomalies (new species, sub-species, varieties, hybrids), or are found to occur at the limit of, or beyond, the previously known range of a taxon. It is recommended that proponents consult with the staff of the State Herbarium and other experts, prior to the survey, for guidance on these significant taxa and whether the locality of the planned survey has been subject to previous survey and therefore whether vouchering of more common taxa may also be warranted.

Local-scale vegetation categories which may be scarce, unknown, refugia, key habitat or at extremes of distribution, should also be noted.

3.5 Auditing or peer reviewing surveys

The EPA does not have the resources to undertake systematic review of all flora and vegetation surveys or reports. To ensure that the methods and standards applied in surveys are of a standard that is adequate to ensure quality environmental assessment by the EPA, a proportion of projects may be selected at random for the audit process. In such cases, selected parts of the survey and the related report (i.e. a sample of the work) may be audited.

Peer review may be warranted for some EIA surveys. Such review must be undertaken by experienced and suitably qualified professionals (Section 3.2.3). Unless there are matters in dispute, the peer review would normally be conducted at the expense of the proponent. The EPA will normally seek to inform the proponent

of the likely requirement for a peer review in the project-specific guidelines or approved scoping document.

Core elements of the peer review process in science are that:

a) the choice of reviewer/s is made by a body independent of the author and the report commissioners (in this case, the EPA is the independent body);
b) the reviewers are qualified and experienced professionals, with levels of relevant experience and expertise at least equivalent to those of the people they are reviewing;
c) the reviewers are clear as to the scope and the limitations of the review (general limitations are considered);
d) the reviewers can remain anonymous; and
e) there is an opportunity to re-submit work after revision.

4 APPLICATION

4.1 Area

This Guidance Statement applies throughout the State of Western Australia and will apply to all new proposals, planning schemes and amendments to schemes.

Position Statement No. 3 indicates that the EPA intends to use IBRA as the largest unit for decision making in relation to maintenance of biodiversity. Proponents will, as a minimum, be required to demonstrate that their proposal can meet objectives which are framed in the context of conservation within the applicable bioregion/s. In some areas, such as the Swan Coastal Plain, the developing framework of biogeographical knowledge and policy may provide a more detailed context (EPA Guidance Statement No. 10 and Government of Western Australia 2000a and b).

4.2 Duration and Review

The duration of this Guidance Statement is for five years, unless circumstances require it to be reviewed earlier.

5 RESPONSIBILITIES

5.1 Environmental Protection Authority responsibilities

The EPA will apply this Guidance Statement when assessing any proposals, planning schemes or amendments where flora and/or vegetation are identified, as relevant factors, prior to or during the assessment.

5.2 Department of Environment responsibilities

The DoE, through the EPA Service Unit (EPASU), will assist the EPA in applying this Guidance Statement in environmental impact assessment and in conducting its functions under Part IV of the EP Act.

The DoE, through the EPASU, will provide more specific advice to proponents and environmental consultants, as required, in relation to detailed interpretation of aspects of this guidance and in relation to specific assessments, within available resources.

5.3 Proponent responsibilities

Assessment is likely to be assisted if proponents demonstrate to the EPA that the requirements of this Guidance Statement are incorporated into proposals.

As outlined in Section 3.3.5 the EPA expects that proponents will ensure that the findings of the original survey report/s appear in an unaltered form in the main text of any review document, and that a copy of the whole survey report will appear as an appendix of the review document.

5.4 Environmental practitioner (including botanical consultant) responsibilities

Environmental practitioners should exercise due professional diligence in the conduct of flora and vegetation surveys and the authorship of flora and vegetation survey reports. Environmental review documents and flora and vegetation survey reports should contain an acknowledgment that the EPA's EIA process is one of the specific purposes for which the document or report has been prepared and that the document is suitable for this purpose. Documents and/or reports that do not do so will not be accepted by the EPA for the purposes of EIA.

It is essential that the standards for survey outlined here are met or exceeded. The EPA urges practitioners to ensure that they fully understand the inherent context and level of meaning of terms before they apply them. Particular use should be made of this document in this regard.

A full and frank statement of impacts is expected at all levels of survey and environmental assessment documentation.

6 DEFINITIONS AND ACRONYMS

6.1 Definitions

Assemblage (compare with community, which is similar) - A collection of co-occurring populations (Lewis 1977).

Biological diversity/biodiversity – is the variety of all life forms - the different plants, animals and microorganisms, the genes they contain, and the ecosystems of which they form a part. It is not static, but constantly changing; it is increased by genetic change and evolutionary processes and reduced by processes such as habitat degradation, population decline, and extinction (Commonwealth of Australia 1996).

Biodiversity has two key aspects:

- its intrinsic value at the genetic, individual species, and species assemblages levels; and
- its functional value at the ecosystem level.

Two different species assemblages may have different *intrinsic* values but may still have the same *functional* value in terms of the part they play in maintaining ecosystem processes.

o **Genetic diversity** – is the variety of genetic information contained in all of the individual plants, animals and microorganisms that inhabit the earth (Commonwealth of Australia 1996). In any given area it is the variety of genetic material contained in all organisms.

Genetic diversity occurs within and between the populations of organisms that comprise individual species as well as among species (Commonwealth of Australia 1996).

Due to a lack of research regarding the genetic range of endemic species, there has been, and will continue to be, difficulty in addressing protection of biodiversity specifically at the genetic level.

However for many species some information is available on the phenotypic expression of genetic variation through the recognition of different taxa at the sub-species or variety level. These may be significant in terms of exhibiting varying distribution and levels of rarity. The protection of species throughout their range and on the variety of sites may therefore serve as a surrogate for protection of genetic diversity in the absence of specific information. This issue needs to be considered in the design/collection and interpretation of data obtained in flora and vegetation surveys.

o **Species diversity** – the variety of species on the earth (Commonwealth of Australia 1996). In any given area it is the variety of species, or a measure of that variety (Lewis 1977; Jones *et al.* 1990).

While diversity can be measured in many ways, *Most simply it is measured as the species richness of ... an area, though it provides a more useful measure ... when it is combined with an assessment of the relative abundance of species present. Diversity within ecosystems has been equated classically with stability and climax communities* (Allaby 1992).

Species diversity is conceptually different from genetic diversity because:

- in general, the recognition of species is based on physical features (a taxonomic approach of recognising, describing, naming and classifying);
- a species is a concept, rather than a clear unit in nature. This can mean that the amount of genetic variation within one species may be markedly different from another species. To accommodate such inconsistencies, sub-divisions such as sub-species, varieties and hybrids may be recognised.

Species diversity is usually the default in biodiversity assessment, which means it becomes a surrogate for the underlying genetic diversity. Species diversity becomes a progressively better estimate of the full range of genetic diversity when it considers the range of variation within a species (including sub-species, varieties, and hybrids), a species' entire range, and the range of habitat in which a species occurs.

Declared Rare and Priority flora are only one subset of species diversity. The scope of formal listings is limited by the extent and intensity of sampling in any area, by how well a surveyor recognises all different organisms in an area, by whether all known occurrences are registered (i.e. whether specimens were submitted), and by the current progress in naming species groups. Since these processes are ongoing, it is clear that survey for environmental impact assessment has a role in extending knowledge. Consequently, consultants are encouraged to check specimens which have no known match, or appear anomalous, and which may be new.

In natural systems, species diversity varies from area to area and so is not a complete measure of the significance of a vegetation unit. Many communities with relatively few species, such as estuaries and mangrove forests, are highly productive and have an abundance of life but not a great variety of species. Similarly, for any species, its significance may come from values other than scarcity, or because it may be under threat. For example, a prolific species may be a key part of an ecosystem (e.g. in terms of bulk, productivity, or the provision of resources such as nest sites or nectar).

o **Ecosystem diversity** – in any given area, the variety of habitats, biotic communities and ecological processes (Commonwealth of Australia 1996).

Ecosystems are the basic functional ecological units. They comprise the diversity of all-living organisms and non-living components and their relationships within a given area. They can be defined at almost any nominated scale. Ecosystems include abiotic components, which include physical factors such as radiation, gases, the water cycle, geology, land and soil forming processes, and climate.

Ecological processes are the interactions, and changes or development processes, of the ecosystem over time.

Ecosystem diversity is harder to measure than species or genetic diversity because the boundaries of ecosystems (or component habitats and communities) are a matter of definition within a matrix. Provided a consistent set of criteria is used to define ecosystems, their number and distribution can be measured. It is therefore essential that scale/s and the basis for differentiation are defined and understood in any treatment of ecosystem diversity.

- **Other expressions of biodiversity** - Other expressions of biodiversity can be important. These include the relative abundance of species, the age structure of populations, the pattern of communities in a region, changes in community composition and structure over time, and ecological processes such as predation, parasitism and mutualism. It is often important to examine diversity in ecosystem structure and function as well as compositional diversity of genes, species and ecosystems (Environmental Protection Authority 2002a).

Community (compare with assemblage and ecological community) - A general term applied to any grouping of populations of different organisms found living together in a particular environment (Allaby 1992). Plant community - an assemblage of plants at any given locality Beard (1990).

The term ‘community’ has been applied at a range of scales in general use (as have ecosystem, habitat and vegetation). In this document ‘community’ is usually used to refer to all populations of all plant species at a locality. This is a detailed approach to plant diversity, with good resolution of the make-up of vegetation. Beard’s regional vegetation mapping was several levels coarser than this.

Completion criteria - Completion criteria apply to the required state of an area at the end of the natural life of a proposal that impacts on that area. Completion criteria are used to stipulate the natural values that should be rehabilitated or, preferably, restored (adapted from Tongway and Hindley 1995 and Tongway *et al.* 1997).

Declared Rare Flora - Species specially protected under the *Wildlife Conservation Act 1950*, as identified in the current listing. At time of printing the listing is Wildlife Conservation (Rare Flora) Notice 2003 (Government of Western Australia 2003b).

Ecological community - Naturally occurring biological assemblage that occurs in a particular type of habitat. Note that the scale at which ecological communities are

defined will often depend on the level of detail in the information source. Therefore no particular scale is specified (English and Blyth 1999).

An assemblage of native species that: a) inhabits a particular natural area; and b) meets the additional criteria specified in the regulations made for the purposes of this definition (EPBC Act 1999).

Ecosystem - A dynamic complex of plant, animal, fungal, and microorganism communities and the associated non-living environment interacting as an ecological unit (Commonwealth of Australia 1996). (That is, all living and non-living parts of a system and their interaction. Non-living factors include climate, atmosphere, and the geosphere.)

Ecosystem function/processes (compare to threatening processes) - Interconnected processes that sustain the biodiversity typical of a given ecosystem, and drive the self-directed development of that ecosystem. Such processes involve all components of ecosystems, living and non-living. One-off biological survey tends to reveal little about ecosystem processes without complementary investigations over time.

Environmental Impact Assessment (EIA) - an orderly and systematic process for evaluating a proposal, including its alternatives and its effect on the environment, and the mitigation and management of those effects. The process extends from the initial concept of the proposal through implementation to commissioning and operation and, where appropriate, decommissioning (Environmental Protection Authority 2002b).

Environmental review document – a document (used in environmental impact assessment) which describes a proposal or plan for human development activity, the pre-existing environment of the area to be affected and the potential environmental impacts of the proposal or plan (including impacts on flora and vegetation). The preparation of an environmental review document may precede or be required as a component of the formal EIA process under the EP Act.

Environmental Indicators of Biodiversity - Applied to State of the Environment (SoE) reporting at a national level (Saunders *et al.* 1998). Indicators most relevant to flora and vegetation survey reporting are listed below, with those of lesser relevance in brackets [thus]:

1 Pressure Indicators (SoE sense)
- extent and rate of clearing or major modification of natural vegetation ... (No. 2.1)
- location and configuration or fragmentation of remnant vegetation ... (No. 2.2)

2 Condition Indicators (SoE sense)
- number of sub-specific taxa (No. 9.1); applies to the number of distinct entities (such as sub-species; ecotypes; geographical, morphological, physiological, behavioural or chromosomal races) readily recognisable

within a species. Attention to the amount of variation within a species is applied as a surrogate means of estimating the genetic variation and monitoring any decline. It is not a perfect substitute. This indicator is more useful for widely distributed species, particularly if they are rich in such variation, cover a number of biogeographic regions or habitats, and have populations with a disjunct or fragmented distribution.

- population size, numbers and physical isolation (No. 9.2)
- number of species (No. 10.1)
- [estimated number of species] (No. 10.2)
- number of species formally described (No. 10.3)
- number of subspecies as a percentage of species (No. 10.5)
- number of endemic species (No. 10.6)
- conservation status of species (No. 10.7)
- [percentage of species changing in distribution] (No. 10.9)
- demographic characteristics of target taxa (No. 10.11)
- ecosystem diversity (No. 11.1)
- number and extent of ecological communities of high conservation potential (No. 11.2)

3 Response Indicators (SoE sense)

- Extent of vegetation type (No. 13.1)
- Proportions of bioregions covered by biological surveys (No. 14)

Factor - This word has two meanings in the contexts of EIA and ecology

1 environmental factor - [ecological definition]
Any component or aspect of the environment that may influence the observed state. Since these factors arise from the environment, they are revealed by impartial observation. They are not imposed. Rather, they are labelled as they manifest themselves. (In ecology, multi-variate analysis is employed in order to account for the influence of all factors other than the one in question, so that its influence clearly stands out).

2 environmental factor - [EPA definition]
Usually broad working divisions used to compartmentalise the environment for administrative purposes. Some of these definitions may have broad similarities with the ecological definitions at higher levels. Since these factors arise from an administrative need to compartmentalise, they are imposed *a priori* (before study). At lower levels, they may more closely approach environmental factors, such as within proposal-specific guidelines or approved scoping documents.

Flora (compare with vegetation) - All the vascular plant taxa (including species, subspecies, varieties, hybrids, and ecotypes) in a given area or epoch (after Collocott and Dobson 1975; Onions 1978; Lewis 1977; Delbridge 1987; Mueller-Dombois and Ellenberg 1974).

Flora and vegetation survey - A field-based investigation (including a review of established literature) of the biodiversity inherent in the flora and vegetation of an area. In terms of EIA or environmental management, the area is usually that of a

proposal or scheme to be reviewed by the EPA. Survey may also include sufficient surrounding areas to place the proposal or plan into local area and/or regional context.

Flora and vegetation survey report - A document describing the objectives, methods, limitations, data results and conclusions of a flora and vegetation survey.

Habitat - The natural environment of an organism or a community, including all biotic and abiotic elements; a suitable place for it to live (after Gilpin 1996; Jones *et al.* 1990; Lewis 1977; Onions 1978; Commonwealth of Australia 1996). The term 'habitat' has been applied at a range of scales in general use (as have community and vegetation). Vegetation can become a reasonable surrogate for outlining habitat when its main components, structure and the associated landform are also described.

Heterogeneity - Diverse in character, varied in content (Onions 1978).

Interim Biogeographic Regionalisation of Australia (IBRA) - the scheme for the division of the continent into natural regions.

- It is based on the assumption that it is the physical processes which drive ecological processes, which in turn are responsible for driving the observed patterns of biological productivity and the associated patterns of biodiversity (Thackway and Cresswell 1995).
- IBRA regions represent a landscape-based approach to classifying the land surface. Specialist ecological knowledge, combined with regional and continental scale data on climate, geomorphology, landform, lithology and characteristic flora and fauna were interpreted to describe these patterns.
- The resulting integrated regions were ascribed the term biogeographic regions. The developers of the IBRA acknowledged that, given the paucity of biophysical data in some parts of the continent, new information through time would modify our understanding of the regions, hence the term interim was used in the title of the IBRA.
- Currently the number has been revised from the original 80 to 85 regions. In addition, 354 **IBRA sub-regions** have been developed (Environment Australia 2000).

Natural Areas - naturally vegetated area or non-vegetated areas such as water bodies (generally rivers, lakes and estuaries), bare ground (generally sand or mud) and rock outcrops (EPA 2003).

Precautionary principle - Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:

- careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and

- an assessment of the risk-weighted consequences of various options.

(Intergovernmental Agreement on the Environment 1992).

This provides an approach for considering the environmental impacts of a proposal on biodiversity values where there is a lack of knowledge and lack of scientific certainty. A useful methodology for applying the precautionary principle is that of Deville and Harding (1997).

Priority Flora - Lists of plant taxa, maintained by the Department of Conservation and Land Management (Atkins 2003), that are either under consideration as threatened flora but are in need of further survey to adequately determine their status, or are adequately known but require monitoring to ensure that their security does not decline.

Proposal specific guidelines - See scoping documents.

Scoping document - A document prepared as part of the referral to the EPA of a Public Environmental Review or Environmental Review and Management Program. Scoping documents are used to outline the environmental factors to be examined as part of environmental impact assessment of a proposal. Scoping documents have replaced proposal-specific guidelines that formerly filled a similar role. This is outlined in the EP Act under Section 6.1 of the *Environmental Impact Assessment (Part IV Division 1) Administrative Procedures 2002.*

The EPA intends that this flora and vegetation guidance will apply to assessments where project-specific guidelines or approved scoping documents cover flora and vegetation survey, and that it will provide the context, standards and principles. Additional or special requirements for individual projects may be specified by the EPA in the proposal-specific guidelines or approved scoping documents or in other advice provided via correspondence with the proponent or consultant. Scoping documents should normally be consistent with this guidance. However, in certain circumstances, there may be a need to vary requirements to suit the particular case, and this would be laid out in the scoping document.

Significant flora – Species, subspecies, varieties, hybrids, and ecotypes may be significant for a range of reasons, other than as Declared Rare Flora or Priority flora, and may include the following:

- a keystone role in a particular habitat for threatened species, or supporting large populations representing a significant proportion of the local regional population of a species;
- relic status;
- anomalous features that indicate a potential new discovery;
- being representative of the range of a species (particularly, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range);
- the presence of restricted subspecies, varieties, or naturally occurring hybrids;
- local endemism/a restricted distribution;

- being poorly reserved.

Significant vegetation - Vegetation may be significant for a range of reasons, other than a statutory listing as Threatened Ecological Communities or because the extent is below a threshold level, which may include the following:

- scarcity;
- unusual species;
- novel combinations of species;
- a role as a refuge;
- a role as a key habitat for threatened species or large populations representing a significant proportion of the local to regional total population of a species;
- being representative of the range of a unit (particularly, a good local and/or regional example of a unit in 'prime' habitat, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range);
- a restricted distribution.

This may apply at a number of levels, so the unit may be significant when considered at the fine-scale (~intra-locality), intermediate-scale (~locality or inter-locality) or broad-scale (~local to region)

Species/area curve - Number of species versus area (Lewis 1977); usually depicted as a graph.

State of the Environment (SoE) reporting (see Environmental Indicators of Biodiversity)

Taxa (singular **Taxon) –** A taxonomic group. Depending on context, this may be a species or their subdivisions (subspecies, varieties etc), genus or higher group.

Threatened Ecological Community - Ecological communities that have been assessed through a procedure (co-ordinated by CALM) and assigned to one of the following categories related to the status of the threat to the community.

The categories are:

1 **Presumed Totally Destroyed;**
2 **Critically Endangered:** <10% of pre-European extent remains in an intact condition in the bioregion;
3 **Endangered:** 10 to 30% of pre-European extent remains;
4 **Vulnerable:** declining and/or has declined in distribution and/or condition, and whose ultimate security is not yet assured (it could move into a category of higher threat in the near future if threatening processes continue) (English and Blyth 1997, 1999).

One of the criteria used to determine the categories of threatened ecological community is an estimate of the geographic range and/or the total area occupied and/or the number of discrete occurrences reduced since European settlement.

Threatening Processes (compare ecosystem function/processes) - Any process or activity that threatens to destroy or significantly modify the ecological community and/or effect the continuing evolutionary processes within any ecological community (English and Blyth 1999). A process that threatens, or may threaten, the survival, abundance or evolutionary development of a native species or ecological community (ANZECC 2000).

Vegetation (compare with flora; and see significant vegetation) - The various combinations that all populations of all vascular plant species form within a given area, and the nature and extent of each combination (after Mueller-Dombois and Ellenberg 1974; Collocott and Dobson 1975; Lewis 1977; Onions 1978; Delbridge 1987). Note that this is a biodiversity approach, and that other approaches may be based on structure or appearance - approaches that describe lesser subsets of plant diversity. The term vegetation has been applied at a range of scales in general use (as have community and habitat). The joint influence of different approaches and levels that can be applied to vegetation has led to a range of terms which describe vegetation, with resulting confusion.

Vegetation unit - A general purpose term to apply to vegetation categories regardless of level, and with no level implied.

This is required because the most variable area of terminology is to do with vegetation and its categorisation at various levels of meaning. If practitioners have any doubt about the application of vegetation terms, it is recommended that they:

- refer to absolute scales, densities, and extent of vegetation as much as possible; and
- use only the generic term "vegetation unit" and qualify whether each unit is fine-scale (~intra-locality), intermediate-scale (~locality or inter-locality) or broad-scale (~local to region).

6.2 Acronyms

ANZECC	Australian and New Zealand Environment and Conservation Council
CALM	Department of Conservation and Land Management
DEP	Department of Environmental Protection
DoE	Department of Environment
DRF	Declared Rare Flora
EIA	Environmental Impact Assessment
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986*
EPASU	Environmental Protection Authority Service Unit
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
GIS	Geographic Information System
IBRA	Interim Biogeographic Regionalisation of Australia

NVIS	National Vegetation Information System
SoE	State of the Environment
TEC	Threatened Ecological Community

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1975b Sheet 5, Pilbara
1976 Sheet 6, Murchison
1979 Sheet 1, Kimberley
1981 Sheet 7, Swan

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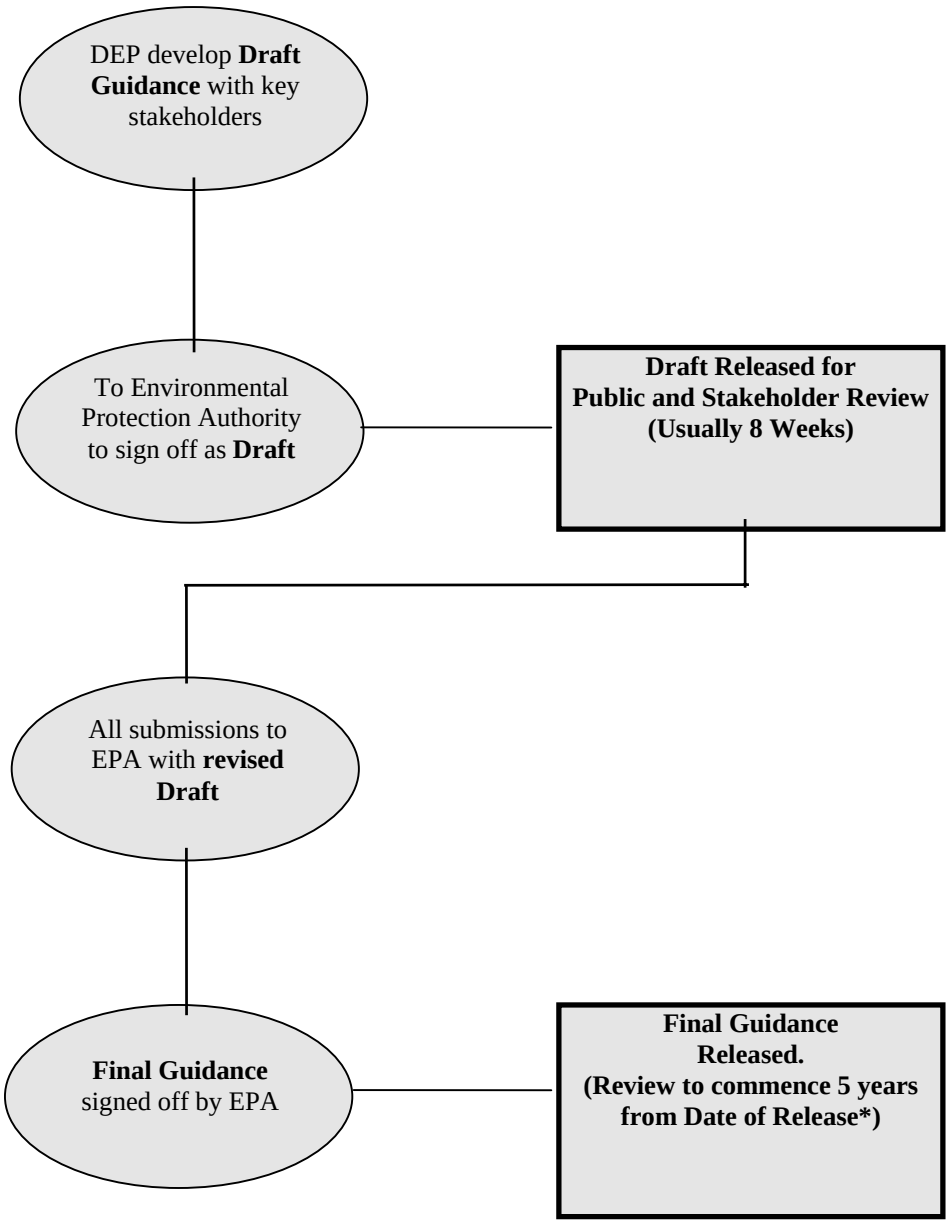
Appendix 1

GENERIC FLOW DIAGRAM FOR THE GUIDANCE STATEMENT PROCESS



* Guidance may be reviewed earlier if circumstances require it.

Appendix 2
GUIDE TO LEVELS OF FLORA AND VEGETATION SURVEY

Table 1: Levels of Flora and Vegetation survey
(adapted from EPA Position Statement No. 3)

Survey levels differ in the capacity of the survey work to provide detail of the conservation and functional values of the target area and its immediate context.	
Level 1 Surveys	**Background research or 'desktop' study** The purpose is to gather background information on the target area (usually at the locality scale). This involves a search of all sources of literature, data and map-based information. **Reconnaissance survey** The purposes are: i) to verify the accuracy of the background study; ii) to further delineate and characterise the flora and the range of vegetation units present in the target area; and iii) to identify potential impacts. This involves a target area visit by suitably qualified personnel to undertake selective, low intensity sampling of the flora and vegetation, and to produce maps of vegetation units and vegetation condition at an appropriate scale.
Level 2 Surveys	Incorporates **Background research** and **Reconnaissance survey** as preparation for more intensive survey that may range in form between detailed and comprehensive survey. **Detailed survey** The purpose is to enhance the level of knowledge at the locality scale. This applies where the general context is better known. This involves: i) one or more visit/s in the main flowering season and visit/s in other seasons; and ii) replication of plots in vegetation units, and greater coverage and displacement of plots over the target area. **Comprehensive survey** The purpose is to enhance the level of knowledge at the locality scale and the context at the local scale. In some cases sub-region survey may be required to provide wider context. This applies where there is only broad general context. This involves survey, at the intensity applied in detailed survey, of both the locality and parts of the local area. Such work is likely to be more structured with longer-term study and multiple visits.

Table 2: Indicative levels of flora and vegetation survey expected by the EPA in relation to the scale and nature of impact of proposals and the sensitivity of the receiving environment

(adapted from EPA Position Statement No. 3)

The bioregions have been grouped in Table 2 according to the existing degree of regional modification or loss of biodiversity, degree of threat and sensitivity to further loss. As a guide to the use of this table, it is very important to note that there will be areas of greater sensitivity within each bioregion that will require special consideration (e.g. wetlands, threatened ecological communities, heritage, geomorphological values, etc). Conversely, for areas with a high degree of pre-existing modification (such as cleared agricultural land) the investigation effort expected is likely to be reduced in comparison with areas supporting native vegetation.

Sensitivity of Environment (Bioregion Groups)	**Numbers indicate level of flora and vegetation survey expected (as defined in Table 1)**		
	Scale and Nature of Impact		
	High	**Moderate**	**Low**
Group 1	2	2	1
Groups 2 and 3	2	1 or 2*	1
Group 4	2	1	1

Bioregion Groups

- **Group 1: Warren, Avon Wheatbelt, Geraldton Sandplains, Esperance Plains, Mallee, Swan Coastal Plain** (bioregions of the South-West Botanical Province that are extensively cleared for agriculture).
- **Group 2: Gascoyne, Carnarvon, Yalgoo, Pilbara, Coolgardie, Murchison, Nullarbor, Hampton,** (bioregions of the Eremaean Botanical Province, native vegetation is largely contiguous but used for commercial grazing) **and Jarrah Forest** (this South-West Botanical Province bioregion is included here because the native vegetation remains extensive and largely contiguous but is used as a commercial forestry resource).
- **Group 3: Dampierland, Northern Kimberley, Central Kimberley, Ord-Victoria Plains, Victoria-Bonaparte** (bioregions of the Northern Botanical Province, native vegetation is largely contiguous but is used for commercial grazing).
- **Group 4: Great Sandy Desert, Gibson Desert, Great-Victoria Desert, Little Sandy Desert, Central Ranges, Tanami** (bioregions of the Eremaean Botanical Province, native vegetation is largely contiguous but is generally not used for commercial grazing).

Table 3: Consideration of the characteristics of proposal areas in defining the scale and nature of impacts on biodiversity (to be used in conjunction with Tables 1 and 2 to provide guidance on the level of flora and vegetation survey required for a proposal)

SITUATION I: The area and its immediate surrounds do not support native vegetation	
The area of the proposal and adjacent areas that could be impacted by off-site impacts from the proposal **do not** support native vegetation (see Keighery 1994). Areas that could be impacted are in a completely degraded condition (Keighery 1994).	**This Guidance Statement is not applicable** It is not expected that the proposal will need to address flora or vegetation factors. Any proposal submitted to the EPA for assessment of other environmental factors should include comprehensive photographs of the area which identify the nature and condition of any vegetation in the area. Depending on the area and nature of the development, it may be appropriate to consider some strategic revegetation or landscaping with local provenance native plant species to re-establish them in the area.

SITUATION II: The area and/or its immediate surrounds supports native vegetation	
If there is native vegetation in or adjacent to the proposal area that could be impacted, and that vegetation is not completely degraded, then background research and reconnaissance survey is required as a minimum. **Note: If the area supports native vegetation within a national park, nature reserve, conservation park, or other reserve formally protected or recommended for protection for a conservation purpose a comprehensive survey is required as a minimum.**	**This Guidance Statement is applicable** The following sections of this Table provide guidance as to the level of flora and vegetation survey expected.

AREA CHARACTERISTICS	EXPLANATION OF SIGNIFICANCE	SCALE AND NATURE OF IMPACT		
		HIGH	MODERATE	LOW
Degree of degradation or clearing within region				
Determine the level of alteration of the original vegetation. The extent of clearing in the district and bioregion is the simplest measure of change and of sensitivity to further change. However, less obvious factors can be measured that have also altered the vegetation and flora. Examples in the Eremaean Province include change in the balance of species under grazing, and associated invasion of introduced species (especially grasses). This is usually referred to as a change in vegetation condition.	This is a background factor in any region, with some regions having significantly higher cumulative degradation than others.	In either the local area or region: i) in fragmented ecosystems with less than 30% native vegetation or natural areas remaining; or ii) in more extensive ecosystems with less than 30% of vegetation in better condition.	In either the local area or region: i) in fragmented ecosystems with between 30-50% native vegetation or natural areas remaining; or ii) in more extensive ecosystems with between 30-50% of vegetation in better condition.	In either the local area or region: i) in fragmented ecosystems with more than 50% native vegetation or natural areas remaining; or ii) in more extensive ecosystems with more than 50% of vegetation in better condition.
Size/scale of proposal/impact				
The size of impact is important in determining the environmental significance of the proposal. This characteristic is not intended to imply relative natural values of bioregions. Rather it reflects the relative degree of disturbance in each group of bioregions.	Area of clearing/loss of native vegetation or habitat expected to result from the proposal.	>10 ha - Bioregion Group 1 >50 ha - Bioregion Groups 2-3 >75 ha - Bioregion Group 4	1-10ha - Bioregion Group 1 10-50ha - Bioregion Groups 2-3 20-75ha - Bioregion Group 4	< 1ha - Bioregion Group 1 <10ha - Bioregion Groups 2-3 <20ha - Bioregion Group 4
Rarity of vegetation				
Consider whether the proposal impacts on vegetation that is restricted or rare, either naturally or as a result of clearing. Threatened Ecological Communities (TEC's) may fit either of these categories. This may include vegetation unit/s, habitat type/s, or landform units.	Impact on **any** naturally rare or restricted vegetation unit or TEC is considered a high to moderate impact.	Vegetation that: i) naturally comprises less than **5%** in the local area (15 km radius) or the bioregion; or ii) is a Threatened Ecological Community.	Vegetation that naturally occupies from **5 to 10%** of the local area (15 km radius) or the bioregion.	Vegetation that is naturally more widespread than **10%** of local area (15 km radius) and the bioregion.

AREA CHARACTERISTICS	EXPLANATION OF SIGNIFICANCE	SCALE AND NATURE OF IMPACT		
		HIGH	MODERATE	LOW
Significant vegetation unit				
Consider whether the area supports vegetation units that have particular significance for ecological reasons; (in addition to Threatened Ecological Communties).	See Section 6 for definition of significance.	Significant vegetation units are known in the area or are found in the area during reconnaissance survey.	i) There are anomalous vegetation units in the area; and/or ii) the vegetation and area characteristics indicate that significant units may occur.	Significant vegetation units are not known from the area or found by reconnaissance survey.
Refugia				
Consider whether the area serves as an ecological refuge. These are more restricted environments that have been isolated for extended periods of time, or are the last remnants of such areas. They may be of high significance for plant taxa or vegetation units with very restricted distributions. Examples include isolated hills which are remnants of an ancient eroding surface, islands, permanent wetlands in arid areas, permanent damplands in wetter regions which may retain Gondwanic elements, patches of ancient palaeodrainage which have vegetation that is not yet affected by secondary salinity as a result of clearing (especially in agricultural areas), mound springs, etc.	For Gondwanic values see Main 1996, Hopper *et al.* 1996, and Horwitz 1994. Arid zone refuges may include taxa with preferences for stability/low seasonality, seclusion from fire, or for permanent water (e.g. Nix 1982); or rainforest elements, with mesic features (Truswell and Harrris 1982); or other derivatives that are now isolated (e.g. Keighery and Gibson 1993, Gibson and Lyons 1997).	Isolated, or disjunct populations and communities are known or are likely to be present. The presence of refuges indicates the potential impact is high.	The characteristics of the area indicate that it could serve as a refuge for some taxa.	Refugia are not known from the area or are not found by reconnaissance survey.

AREA CHARACTERISTICS	EXPLANATION OF SIGNIFICANCE	SCALE AND NATURE OF IMPACT		
		HIGH	MODERATE	LOW
Rare or Priority flora				
Consider whether statutory significant and Priority flora occur or may occur in the area.	Declared Rare Flora (DRF) and Priority flora.	i) DRF species are found in the area or in similar vegetation in its immediate vicinity during reconnaissance survey; and/or ii) the vegetation and area characteristics indicate that DRF species may occur. The presence of several Priority species may also raise the impact to high.	i) Priority species are found in the area or in similar vegetation in its immediate vicinity during reconnaissance survey; and/or ii) the vegetation and area characteristics indicate that Priority species may occur. Cumulative impact on the total number of populations should be considered.	DRF and Priority flora species are not found by reconnaissance survey, and are not likely to be found in the area or its immediate vicinity, on the basis of existing information. Generally, the area would be well known from one, and ideally more than one, well timed and structured survey.
Other significant flora				
Consider whether the area supports taxa that have particular significance for ecological reasons.	Taxa at the extremes of their range, or isolated outlying populations; taxa with anomalous features which may be new. See Section 6 for definitions of significance.	-	Significant species or taxa are found in the area or in similar vegetation in its immediate vicinity during reconnaissance survey.	Significant species or taxa are not found in the area or in similar vegetation in its immediate vicinity during reconnaissance survey.

AREA CHARACTERISTICS	EXPLANATION OF SIGNIFICANCE	SCALE AND NATURE OF IMPACT		
		HIGH	MODERATE	LOW
Size of remnant and condition/intactness of vegetation				
Determine whether the proposal impacts on a relatively large more or less intact remnant (e.g. Bioregion Group 1), or is an area of more or less intact vegetation in areas of extensively degraded landscapes (e.g. Bioregion Groups 2 and 3).	Large intact remnants are key biodiversity reservoirs in fragmented environments. In some cases even small, but intact, remnants may be highly significant. Areas of relatively intact vegetation in regions/districts where the vegetation is generally in poorer condition are also important for retention of biodiversity. Desktop study should seek to determine the size of remnants and/or vegetation condition relative to those in the local surrounds (≥15km radius).	Area is a relatively large compact remnant, or part of a large compact remnant in a district where native vegetation is fragmented by clearing and/or other degradation; or an area of native vegetation, which is more intact than typical for the local district or bioregion.	Area supports a remnant of less than average size and degree of intactness in the district; or the vegetation is not more intact than that in the district.	Area is not in a fragmented environment or an environment with extensive areas of otherwise degraded vegetation, such as some rangeland environments.
Ecological Linkage				
Determine the ecological linkage role of the area in the local and regional context.	Ecological linkages have important biodiversity conservation roles, therefore the values of these roles are highly sensitive to change.	The area is part of an ecological linkage at the regional or local scale.	The area is not directly connected to adjoining areas but is part of a minor ecological linkage.	The area is isolated with no ecological linkages.
Heterogeneity or complexity of the vegetation				
Determine the characteristics of remnants relative to those in the local surrounds through desktop and reconnaissance surveys.	The relative complexity of the area is expressed by the range of landforms/habitats/vegetation units and associated ecotones.	The area and/or its immediate surrounds are complex, with a wider range of component units relative to the character of the local and regional surrounds.	The area and/or its immediate surrounds have a similar range of component units relative to the characteristics at the local and regional scale.	The area and its immediate surrounds are less complex relative to the characteristics of the local and regional scale.

Phytophthora Disease Action Plan (*P*-DAP)

Objective: To eliminate any risk of transportation of phytophthora from known infected sites to known *Phytophthora* Free "protectable" areas.
Risk: Vehicle movement, foot traffic, and equipment movement. **Vector**: Soil, organic material
Mitigation of Risk: Total removal of all organic material known to transport or with the potential of transporting Phytophthora.

MOVEMENT

Weather conditions must be considered to determine soil moisture condition before any movement is planned, and reassessed at time of movement. Close consultation with Park Ranger must occur at all times.

1.0 Movement between areas

1.1 Movement from Known Infected (or unknown) to *Phytophthora* Free areas
- 1.1.1 Under **Dry** Soil Conditions
  - **All** *vehicles/equipment/shoes* **must** be **cleaned thoroughly**
  - Clean vehicle movement acceptable
- 1.1.2 Under **Wet** Soil Conditions
  - **No movement** acceptable

1.2 Movement from *Phytophthora* Free to Known Infected areas
- 1.2.1 Under **Dry** Soil Conditions
  - Vehicle movement acceptable without cleaning
- 1.2.2 Under **Wet** Soil Conditions
  - Movement acceptable up to a certain moister threshold
  - **Boundary** must have been previously demarcated
  - Care must be taken to not affect track condition/surface

2.0 Movement within Areas

2.1 Movement within Known Infected area
- 2.1.1 Under **Dry** Soil Conditions
  - Vehicle movement acceptable
  - Knowledge of infested (and suspected) areas/boundaries essential
- 2.1.2 Under **Wet** Soil Conditions
  - **No movement** acceptable unless boundary has been demarcated
  - Wash down should be implemented upon departure (refer 1.1)
  - Care must be taken to not affect track condition/surface

2.2 Movement within *Phytophthora* Free areas
- 2.2.1 Under **Dry** Soil Conditions
  - **Clean vehicle** movement acceptable
  - Knowledge of infested (and suspected) areas/ boundaries essential
- 2.2.2 Under **Wet** Soil Conditions
  - Movement acceptable up to a certain moister threshold
  - Knowledge of infested (and suspected) areas essential
  - Threshold to be advised by ranger (moist soil - no soil movement)
  - Care must be taken to not affect track condition/surface

Australian Government

Department of the Environment, Water, Heritage and the Arts

Notification of REFERRAL DECISION – not controlled action if undertaken in a particular manner

Road Upgrade and Walk Trail Development, Fitzgerald River National Park, WA (2009/4958)

This decision is made under Sections 75 and 77A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

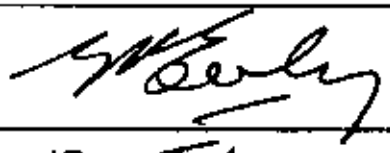
Proposed action

person named in the referral	Director General, Western Australia Department of Environment and Conservation
proposed action	To upgrade, realign where necessary and seal existing roads at the eastern and western ends of the Fitzgerald River National Park, and construct a coastal walk trail in and just outside the Fitzgerald River National Park, Western Australia.

Referral decision: Not a controlled action if undertaken in a particular manner

status of proposed action	The proposed action is not a controlled action provided it is undertaken in the manner set out in this decision.

Person authorised to make decision

Name and position	Mr Gerard Early Deputy Secretary Department of the Environment, Water, Heritage and the Arts
signature	
date of decision	17 July 2009

manner in which proposed action must be taken	The following measures must be taken to avoid significant impacts on • Listed threatened species and communities (sections 18 & 18A) and • Listed migratory species (sections 20 & 20A) 1. The action must be taken in accordance with the plans and policies outlined in the referral document. 2. The action must be managed within the scope of the Park's primary management objectives of "conserving all flora and fauna" within the park. 3. Impacts on special environmental areas must be firstly avoided, or where unavoidable, mitigated through the specific procedures outlined within section 4 of the referral documentation. 4. The project must not result in a net loss of EPBC Act listed threatened or migratory species; or habitat for EPBC Act listed threatened species; or important habitat for EPBC Act

listed migratory species.

5. No clearing may be undertaken if it will or is likely to significantly impact the conservation status of an EPBC Act listed species; or lead to a decline in size of, or area of occupation of, an important population of an EPBC Act listed species.
6. There must be no further spread of dieback to special environmental areas as a result of the development, its associated activities and/or its consequential impacts.
7. The Response Plan for the Management of *Phytophthora cinnamomi* in the Fitzgerald River National Park 2006 – 2011 must be applied.
8. A dieback and weed management plan must be developed for the action, and must be implemented, as outlined in Section 4 of the referral document.
9. Growth in visitor numbers as a result of the development must be in line with the Park's overall commitment to no detrimental impacts on the natural environment, including matters of national environmental significance protected under the EPBC Act.
10. Any growth in camping numbers or facilities must be managed within the guidelines of the Park's management plan, with mechanisms implemented to manage these impacts to ensure that there are no impacts upon the parks special environmental areas.

Definitions

EPBC Act listed threatened species are species of both flora and fauna that are listed under the EPBC Act (1999) as any of the following categories: extinct in the wild, critically endangered, endangered or vulnerable. These also include threatened ecological communities that may be considered critically endangered or endangered.

Habitat for EPBC Act listed threatened species are areas that are necessary:
- for activities such as foraging, breeding, roosting, or dispersal;
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);
- to maintain genetic diversity and long term evolutionary development; or
- for the reintroduction of populations or recovery of the species or ecological community.

Such habitat may be, but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.

Important Habitat for listed Migratory species is:
a) habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species; and/or
b) habitat that is of critical importance to the species at particular life-cycle stages; and/or
c) habitat utilised by a migratory species which is at the limit of the species range; and/or
d) habitat within an area where the species is declining.

Special Environmental areas are areas containing EPBC Act listed threatened species, habitat for EPBC Act listed threatened species, or important habitat for EPBC Act listed migratory species

Important populations are populations that are necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:
- key source populations either for breeding or dispersal;
- populations that are necessary for maintaining genetic diversity; and/or
- populations that are near the limit of the species range.

Consequential Impacts are impacts that may result directly or indirectly from the development. They are impacts that would have not occurred had the action not taken place.

Australian Government

Department of the Environment, Water, Heritage and the Arts

Referral of proposed action

What is a referral?

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) provides for the protection of the environment, especially matters of national environmental significance (NES). Under the EPBC Act, a person must not take an action that has, will have, or is likely to have a significant impact on any of the matters of NES without approval from the Australian Government Environment Minister. To obtain approval from the Environment Minister, a proposed action should be referred. The purpose of a referral is to obtain a decision on whether your proposed action will need formal assessment and approval under the EPBC Act.

Your referral will be the principal basis for the Minister's decision as to whether approval is necessary and, if so, the type of assessment that will be taken. These decisions are made within 20 business days, provided that sufficient information is provided in the referral.

Who can make a referral?

Referrals may be made by a person proposing to take an action, the Commonwealth or a Commonwealth agency, a state or territory government, or agency, provided that the relevant government or agency has administrative responsibilities relating to the action.

When do I need to make a referral?

A referral must be made for actions that are likely to have a significant impact on the following matters protected by Part 3 of the EPBC Act:

World Heritage properties (sections 12 and 15A)

National Heritage places (sections 15B and 15C)

Wetlands of international importance (sections 16 and 17B)

Listed threatened species and communities (sections 18 and 18A)

Listed migratory species (sections 20 and 20A)

Protection of the environment from nuclear actions (sections 21 and 22A)

Commonwealth marine environment (sections 23 and 24A)

The environment, if the action involves Commonwealth land (sections 26 and 27A), including:

- actions that are likely to have a significant impact on the environment of Commonwealth land (even if taken outside Commonwealth land);
- actions taken on Commonwealth land that may have a significant impact on the environment generally;

The environment, if the action is taken by the Commonwealth (section 28)

Commonwealth Heritage places outside the Australian jurisdiction (sections 27B and 27C)

You may still make a referral if you believe your action is not going to have a significant impact, or if you are unsure. This will provide a greater level of certainty that Commonwealth assessment requirements have been met.

To help you decide whether or not your proposed action requires approval (and therefore, if you should make a referral), the following guidance is available from the Department's web site:

the Policy Statement titled Significant Impact Guidelines 1.1 – Matters of National Environmental Significance. Additional sectoral guidelines are also available.

the Policy Statement titled Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies.

the interactive map tool (enter a location to obtain a report on what matters of NES may occur in that location).

Can I refer part of a larger action?

In certain circumstances, the Minister may not accept a referral for an action that is a component of a larger action and may request the person proposing to take the action to refer the larger action for consideration under the EPBC Act (Section 74A, EPBC Act). If you wish to make a referral for a staged or component referral, read 'Fact Sheet 6 Staged Developments/Split Referrals' and contact the Referral Business Entry Point (1800 803 772).

Do I need a permit?

Some activities may also require a permit under other sections of the EPBC Act. Information is available on the Department's web site.

What information do I need to provide?

Schedule 2 of the EPBC Regulations sets out the information that must be included in a referral. Completing all parts of this form will ensure that you submit the required information and will also assist the Department to process your referral efficiently.

You can complete your referral by entering your information into this Word file.

Instructions

Instructions are provided in green text throughout the form.

Attachments/supporting information

The referral form should contain sufficient information to provide an adequate basis for a decision on the likely impacts of the proposed action. You should also provide supporting documentation, such as environmental reports or surveys, as attachments.

Coloured maps, figures or photographs to help explain the project and its location should also be submitted with your referral. Aerial photographs, in particular, can provide a useful perspective and context. Figures should be good quality as they may be scanned and viewed electronically as black and white documents. Maps should be of a scale that clearly shows the location of the proposed action and any environmental aspects of interest.

Please ensure any attachments are below two megabytes (2mb) as they will be published on the Department's website for public comment (Note: the Minister may decide not to publish information that is commercial-in-confidence). To minimise file size, enclose maps and figures as separate files if necessary. If unsure, contact the Referral Business Entry Point for advice. Attachments larger than two megabytes (2mb) may delay processing of your referral.

How do I submit a referral?

Referrals may be submitted by mail, fax or email.

Mail to:

Referral Business Entry Point
Environment Assessment Branch
Department of the Environment, Water, Heritage and the Arts
GPO Box 787
CANBERRA ACT 2601

- If submitting via mail, electronic copies of documentation (on CD/DVD or by email) are appreciated.

Fax to: 02 6274 1789

Faxed documents must be of sufficiently clear quality to be scanned into electronic format.

Address the fax to the mailing address, and clearly mark it as a 'Referral under the EPBC Act'.

Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

Email to: epbc.referrals@environment.gov.au

Clearly mark the email as a 'Referral under the EPBC Act'.

Attach the referral as a Microsoft Word file and, if possible, a PDF file.

Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

What happens next?

Following receipt of a valid referral (containing all required information) you will be advised of the next steps in the process, and the referral and attachments will be published on the Department's web site for public comment (**Note: the Minister may decide not to publish information that is commercial-in-confidence**).

The Department will write to you at the end of 20 business days to advise you of the outcome of your referral and whether or not formal assessment and approval under the EPBC Act is required. There are a number of possible decisions regarding your referral, including:

The proposed action is NOT LIKELY to have a significant impact and does NOT NEED approval

No further consideration is required under the environmental assessment provisions of the EPBC Act and the action can proceed (subject to any state or local government requirements).

The proposed action is NOT LIKELY to have a significant impact IF undertaken in a particular manner

The particular manner in which you must carry out the action will be identified as part of the final decision. You must report your compliance with the particular manner to the Department.

The proposed action is LIKELY to have a significant impact and does NEED approval

If the action has, will have or is likely to have a significant impact it is called a *controlled action* and the particular matters upon which the action may have a significant impact (such as World Heritage or threatened species) are known as the *controlling provisions*.

The proposed action is subject to a public assessment process before it can be considered for approval. The assessment approach will usually be decided at the same time as the controlled action decision. (Further information about the levels of assessment and basis for deciding the approach are available on the Department's web site.)

Compliance audits

The Department may audit your project at any time to ensure that it was completed in accordance with the information provided in the referral or the particular manner specified in the decision. If the project changes, such that the likelihood of significant impacts could vary, you should write to the Department to advise of the changes.

For more information

call the Department of the Environment, Water, Heritage and the Arts Community Information Unit on 1800 803 772 or

visit the web site www.environment.gov.au/epbc

All the information you need to make a referral, including documents referenced in this form, can be accessed from the above web site.

Referral of proposed action

Project title: Road upgrades and walk trail development to and in Fitzgerald River National Park

1 Summary of proposed action

1.1 **Short description**

The Western Australian Government is proposing to upgrade and seal existing roads at the eastern and western ends of the national park, and construct a coastal walk trail, in (and just outside) the Fitzgerald River National Park on the south coast of Western Australia. This proposal keeps roads to the scale of a tourist road with small scale tourist facilities, in keeping with the national park's management plan and is not proposing a highway or major tourist development. Road upgrades, which will need to include associated facilities such as additional parking and recreation facilities, are based on existing unsealed. The walk trail will include shelters set at a distance of a day's walk apart. The proposal aims to increase the reliability of access to the park for visitors and tour operators by providing year-round guaranteed access. The walk trail will provide a new recreation opportunity within the park.

1.2 **Latitude and longitude**

	Latitude			Longitude		
location point	degrees	minutes	seconds	degrees	minutes	seconds
See Attachment 1 for the GPS locations along the indicative road and walk trail alignments. See Attachments 2a and 2b for maps showing the indicative alignments.						

1.3 **Locality**

Fitzgerald River National Park is located on the south coast of Western Australia between Bremer Bay and Hopetoun, close to Ravensthorpe and Jerramungup. The nearest regional centres are Albany to the west and Esperance to the east.

1.4	**Size of the development footprint or work area (hectares)**	Estimated at 421 hectares, with approximately 80% of the proposal footprint to be located on existing roads, tracks and sites.
1.5	**Street address of the site**	Point Ann Road, Murray Road, Swamp Road, Pabelup Drive, Hamersley Drive, coastal walk trail between Hopetoun and Bremer Bay.

1.6 **Lot description**

Fitzgerald River National Park comprises two A class reserves 31737 and 31738, encompassing about 329,039 hectares. The national park extends to the low water mark of the Southern Ocean. Other reserves include local government road reserves.

1.7 **Local Government Area and Council contact (if known)**

Approval for some parts of the road upgrades will be required from Ravensthorpe and Jerramungup Local Government Areas.
CEO – Shire of Ravensthorpe – Pascoe Durtanovich
CEO – Shire of Jerramungup – Bill Porter

1.8 **Timeframe**

Planning and the approvals process can commence immediately. Pending approvals, it is estimated that construction may commence in late 2009 with completion planned for 2011/2012.

1.9	**Alternatives** Does the proposed action include alternative timeframes, locations or activities?	✓	No
			Yes, you must also complete section 2.2
1.10	**State assessment** Is the action subject to a state or territory environmental impact assessment?		No
		✓	Yes, you must also complete Section 2.4
1.11	**Component of larger action** Is the proposed action a component of a larger action?	✓	No
			Yes, you must also complete Section 2.6
1.12	**Related actions/proposals** Is the proposed action related to other actions or proposals in the region (if known)?		No
		✓	Yes, provide details: Fitzgerald River National Park is managed by the Department of Environment and Conservation (DEC), which implements conservation and visitor services works consistent with the park's management plan.
1.13	**Australian Government funding** Has the person proposing to take the action received any Australian Government grant funding to undertake this project?	✓	No
			Yes, provide details:

2 Detailed description of proposed action

2.1 Description of proposed action

The proposal will improve access management in Fitzgerald River National Park by upgrading existing roads and establishing a walk trail, as shown at attachment 2. The proposal will utilise existing road alignments. Road upgrades will involve widening and sealing. Realignments will be required in some areas to ensure compliance with Australian Standards. Roads identified in this proposal within the national park have a width of 5 metres to 9 metres. This proposal aims to upgrade roads within the national park to a speed limit of 60km per hour which will require a road width of 9 metres. Widening and realignments will be undertaken in such a way as to avoid significant impacts. Measures to avoid and reduce impacts are outlined in section four.

Road upgrades will need to include associated facilities such as additional parking and recreation facilities to manage visitor impacts at Mylies beach, West beach, Four Mile campground, Barrens beach, East Mt Barren and Hamersley Inlet in the east of the park and St Mary's campground, Point Ann, Little Boondalup and Trigelow in the west of the park. Recreation facilities will be consistent with the park's management plan and may include parking and ablution facilities, lookouts and interpretive signage. Recreation site development will be undertaken in such a way as to avoid significant impacts whilst catering for increased visitor numbers. Measures to avoid and reduce impacts are outlined in section four.

This proposal also includes the development of a coastal walk trail. A walk trail will require a minor amendment to the park management plan. The walk trail will replace an existing unformed walking route, which will be closed. The new walk trail is to be developed on an improved alignment with shelters located a distance of a day's walk apart. Shelters will include drinking water storage from off-roof catchments. Walk trail and shelter development will be undertaken in such a way as to avoid significant impacts. Measures to avoid and reduce impacts are outlined in section four.

The rationale for the proposal is to reduce the risk of spreading the pathogen *Phytophthora cinnamomi* (dieback). Roads in the park are currently closed under wet conditions, consistent with the park's statutory management plan, to reduce this risk. Currently there is a risk of spreading dieback from road repairs following wet weather, or as a result of unauthorised visitor access during wet conditions. At the same time, the proposal will improve road and walk trail facilities to and in the park to manage the increasing demand by visitors for access to the park and the coast. The proposal will also provide reliable year-round access to the park for visitors and tour operators. The upgrade will involve improved siting, drainage and sealing to allow all-weather operation. This will result in improved environmental and recreation outcomes. In the event there is any road realignment to provide better environmental protection, the existing road alignment will be ripped and rehabilitated. In doing so the Department will undertake flora and dieback surveys and instigate other measures as outlined in section four to ensure there will be no significant impact on any matters of national environmental significance.

These upgrades are consistent with the management of the national park according to statutory requirements and accepted park management practices and standards.

2.2 Alternative locations, time frames or activities that form part of the referred action

n/a

2.3 Context, planning framework and state / local government requirements

Fitzgerald River National Park is managed under the *Fitzgerald River National Park Management Plan 1991 – 2001*, which is a statutory management plan prepared under the *Conservation and Land Management Act 1984* (CALM Act) (Attachment 3). Under the CALM Act, the plan remains in force until it is formally revised. Fitzgerald River National Park is vested in the Conservation Commission of Western Australia, which is a statutory body under the CALM Act.

One of the strategies in the management plan is to ensure that roads, tracks and paths are well-located and well-drained to minimise the chances of the pathogen *Phytophthora cinnamomi* (dieback) to survive. The management plan also lists upgrading of roads to meet these standards as a priority. The Conservation Commission has indicated that the roading upgrades proposed herein are consistent with the management plan for the park. The Conservation Commission has indicated that it supports the sealing of these roads due to the environmental and visitor benefits that will result.

The Conservation Commission has supported the walk trail concept and has indicated that a minor amendment to the management plan may be required to allow this, which it will support and progress. Advice will be sought on an ongoing basis from the Conservation Commission on more detailed plans as they are developed.

The *Fitzgerald River National Park Management Plan 1991-2001* establishes a wilderness zone that covers the centre of the park in which "access is non-motorised except in emergency situations and for essential management purposes. The level of management is low". As such, there is no unauthorised access permitted to the wilderness zone of the national park. Authorisation to enter this area can only be provided by the Director General of the Department of Environment and Conservation and the Chairman of the Conservation Commission following consideration of proposals. For example, research activities into the endangered western ground parrot in the wilderness zone must be in accordance with these authorisations and attached conditions. Conditions may include restrictions on movements off formed management tracks (an example of an application and approval for mechanised access within Fitzgerald River National Park is provided at Attachment 4).

The values in the Fitzgerald River National Park are outlined in the management plan and are reproduced below.

- Fitzgerald River National Park is one of Australia's richest conservation reserves for plants and animals. It is also an extremely important remnant, as much of the south-west has been cleared for agriculture. Some 20% of the known plant species of Western Australia occur within the 0.1% of the State occupied by the park. At least 75 of these occur only within the Park. The park also contains 10 species of declared rare mammals and birds.
- The Fitzgerald landscapes, with extensive vistas showing little to no evidence of human occupation or use, are a major attraction.
- The park has a rich cultural history with numerous sites of historical and archaeological importance.
- The park is one of only two international biosphere reserves in Western Australia. The biosphere reserve values are enhanced by local community interest in the park, and local adoption of the biosphere reserve concept.
- Fitzgerald provides a range of recreation opportunities in a natural setting.

- The park is well-placed to attract tourists travelling in the south-west and south-east of the State.

The management goals for Fitzgerald River National Park recognise the significant values of this park. Conservation is the highest management priority and management goals recognising this priority are described in the management plan (listed below).

CONSERVATION GOALS

- Conserve all native plant communities, animal communities, species, and the natural processes which sustain them, especially the large numbers of rare species and those in need of special protection.
- Conserve the park's landscapes, in particular the extensive vistas free of human disturbance.
- Conserve the rich Aboriginal and European history of the Park, including numerous historical and archaeological sites.

RECREATION GOAL

- Fulfil the nature-based recreation requirements of visitors to the extent that they are compatible with conserving the park's flora, fauna and landscape values, wilderness qualities and cultural heritage.

EDUCATION GOAL

- Foster a sense of stewardship for the park by the community at all levels - local, State, national and international - emphasising its special conservation, landscape, recreation, cultural and historic values.

RESEARCH AND MONITORING GOALS

- Promote and undertake the scientific study and monitoring of those physical, biological and social values and natural processes special to the park.
- Measure and control impacts of management activities and human use on the park environment.

2.4 Environmental impact assessments under Commonwealth, state or territory legislation

This proposal may be referred to the Western Australian Environmental Protection Authority under the *Environmental Protection Act 1986* (WA) for advice on whether formal impact assessment is required. However, it is considered unlikely that the proposal will have a significant adverse impact on the environment. The Environmental Protection Authority seeks the advice of the Conservation Commission on any referred proposals and the Conservation Commission's advice will be sought throughout the planning phase. In addition, flora and fauna that is specially protected as threatened flora or fauna under the *Wildlife Conservation Act 1950* (WA) cannot be removed without approval from the Western Australian Minister for Environment.

The Environmental Protection Authority's *Guidance Statement No. 56 Guidance for the Assessment of Environmental Factors - Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia* (EPA 2004) (see Attachment 5); and *Guidance Statement No. 51 Guidance for the Assessment of Environmental Factors - Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (EPA 2004) (see Attachment 6) will be applied by DEC and Main Roads Western Australia.

2.5 Consultation with Indigenous stakeholders

Should the proposal proceed, consultation with Indigenous stakeholders including the South West Aboriginal Land and Sea Council would be undertaken. Aboriginal heritage surveys will be conducted and best practice management protocols will be applied, including appropriate consultation with

elders in the event a cultural heritage site is discovered in or near the area to be disturbed. The action will be implemented in accordance with the *Aboriginal Heritage Act 1972* and the *Heritage of Western Australia Act 1990*. If cultural heritage sites are discovered during construction, works will be stopped immediately and appropriate archaeological and/ or ethnographic surveys and consultation with elders will be undertaken.

Broader consultation with the community, including key stakeholders, will be undertaken on the detailed proposal.

2.6 A staged development or component of a larger project

Not applicable.

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

3.1 (a) World Heritage Properties

Description

No World Heritage properties lie within or near the project area.

3.1 (b) National Heritage Places

Description

Fitzgerald River National Park is being assessed for inclusion on the National Heritage List.

Nature and extent of likely impact

National Heritage values have not yet been provided as the place has not been included on the National Heritage List at this stage.

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description

No wetlands of international importance lie within or near the project area.

3.1 (d) Listed threatened species and ecological communities

Description

Threatened species that are potentially found in the project area are listed in Table 1.

Table 1 Threatened species potentially found in project area

Birds		
Calyptorhynchus latirostris Carnaby's Black-Cockatoo, Short-billed Black-Cockatoo	Endangered	Species or species habitat likely to occur within area
Dasyornis longirostris Western Bristlebird	Vulnerable	Species or species habitat likely to occur within area
Leipoa ocellata Malleefowl	Vulnerable	Species or species habitat likely to occur within area
Pezoporus wallicus flaviventris Western Ground Parrot	Endangered	Species or species habitat likely to occur within area
Psophodes nigrogularis oberon Western Whipbird (western mallee)	Vulnerable	Species or species habitat likely to occur within area
Mammals		
Dasyurus geoffroii Chuditch, Western Quoll	Vulnerable	Species or species habitat likely to occur within area
Parantechinus apicalis Dibbler	Endangered	Species or species habitat likely to occur within area

Phascogale calura Red-tailed Phascogale	Endangered	Species or species habitat may occur within area
Pseudomys shortridgei Dayang, Heath Rat	Vulnerable	Species or species habitat likely to occur within area
Plants		
Adenanthos dobagii Fitzgerald Woollybush	Endangered	Species or species habitat likely to occur within area
Adenanthos ellipticus Oval-leaf Adenanthos	Vulnerable	Species or species habitat likely to occur within area
Anigozanthos bicolor subsp. *minor* Little Kangaroo Paw, Two-coloured Kangaroo Paw	Endangered	Species or species habitat likely to occur within area
Coopernookia georgei Mauve Coopernookia	Endangered	Species or species habitat likely to occur within area
Daviesia obovata Paddle-leaf Daviesia	Endangered	Species or species habitat known to occur within area
Eremophila denticulata subsp. *denticulata* Fitzgerald Eremophila	Vulnerable	Species or species habitat likely to occur within area
Eucalyptus burdettiana Burdett Gum	Endangered	Species or species habitat likely to occur within area
Eucalyptus coronata Crowned Mallee	Vulnerable	Species or species habitat likely to occur within area
Grevillea infundibularis Fan-leaf Grevillea	Endangered	Species or species habitat likely to occur within area
Myoporum cordifolium Jerramungup Myoporum	Vulnerable	Species or species habitat likely to occur within area
Ricinocarpos trichophorus Barrens Wedding Bush	Endangered	Species or species habitat likely to occur within area
Stylidium galioides Yellow Mountain Triggerplant	Vulnerable	Species or species habitat likely to occur within area
Verticordia crebra	Vulnerable	Species or species habitat likely to occur within area
Verticordia helichrysantha Coast Featherflower	Vulnerable	Species or species habitat likely to occur within area
Verticordia pityrhops	Endangered	Species or species habitat likely to occur within area

Nature and extent of likely impact

Minimal impact as this proposal mainly involves utilising existing road alignments. During the detailed planning process, impacts on threatened species will be avoided by following guidelines and policies for best practice.

3.1 (e) Listed migratory species

Description

Migratory species that are potentially found in the project area are listed in Table 2.

Table 2 Migratory species potentially found in the project area

Migratory Terrestrial Species		
Birds		
Haliaeetus leucogaster White-bellied Sea-Eagle	Migratory	Species or species habitat likely to occur within area
Leipoa ocellata Malleefowl	Migratory	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater	Migratory	Species or species habitat may occur within area
Pezoporus wallicus flaviventris Western Ground Parrot	Migratory	Species or species habitat likely to occur within area
Migratory Wetland Species		

Birds		
Ardea alba Great Egret, White Egret	Migratory	Species or species habitat may occur within area
Ardea ibis Cattle Egret	Migratory	Species or species habitat may occur within area
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift	Migratory	Species or species habitat may occur within area
Ardea alba Great Egret, White Egret	Migratory	Species or species habitat may occur within area
Ardea ibis Cattle Egret	Migratory	Species or species habitat may occur within area
Sterna caspia Caspian Tern	Migratory	Breeding likely to occur within area

Nature and extent of likely impact

Minimal impact as this proposal mainly involves utilising existing road alignments. During the detailed planning process, impacts on migratory species will be avoided by following guidelines and policies for best practice.

3.1 (f) Commonwealth marine area

Description

There is no Commonwealth marine area within the project area.

3.1 (g) Commonwealth land

Description

There is no Commonwealth land within the project area.

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, or actions taken on Commonwealth land

3.2 (a)	**Is the proposed action a nuclear action?**	✓	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (b)	**Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?**	✓	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (c)	**Is the proposed action to be taken in a Commonwealth marine area?**	✓	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))

3.2 (d)	**Is the proposed action to be taken on Commonwealth land?**	✓	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))

3.3 Other important features of the environment

3.3 (a) Soil and vegetation characteristics

LANDFORM	GEOLOGY	SOIL TYPE	VEGETATION
Upland	Granites, gneisses	• extensive areas of shallow loamy sand • skeletal soils associated with granite exposures	• very open mallees of *E. redunca* or *E. tetragona* • Allocasuarina, Grevillea and Acacia scrub/heath associated with granite outcrops
Plain	Spongolite, siltstone	• duplex shallow sandy loams, colluvial sands and cracking clays • skeletal soils on bedrock exposures	• very open mallee of *E. decipiens* widespread • elsewhere open to very open shrub mallee
Valleys	Spongolite, siltstone	• sandy loam – shallow on walls, deeper on valley floor	• open shrub mallee of *E. conglobata* and *E. incrassata* on valley floors and drainage lines • low woodland on slopes and rims • open mallee on mesas
Ranges	Quartzite, phyllite, dolomite, conglomerates	• quartzite sand on quartzite • phyllitic loamy sand or schist duplex soils	• Banksia scrub and Adenanthos open low scrub on quartzite • very open shrub mallee of *E. incrassata*, and Banksia and Allocasuarina low scrub on phyllitic schists
Dunes	Sand over spongolite or quartzite	• loose calcareous or siliceous sands	• mallee and shrubland becoming lower and denser heath closer to coast
Inlets	Incised in quartzite, spongolite or limestone	• saline soils next to inlet • narrow deposits of colluvium and alluvium spongolite, at some slope and cliff bases	• Melaleuca woodland or shrubland on edges • Samphire heath on flats
Rivers, swamps and lakes	Granites, spongolite, quartzite	• dependent on underlying rock	• *E. occidentalis* woodland dominant

3.3 (b) Water flows, including rivers, creeks and impoundments

There are four main rivers in Fitzgerald River National Park: the Gairdner, Fitzgerald, Hamersley and Phillips. These run roughly from north-west to south-east through the Park. All have at least part of their catchments in cleared agricultural land. A number of shorter rivers and streams, most notably the St Mary and Dempster, have catchments within the Park. All rivers in the Park are intermittent, with the majority of flows occurring during winter and spring.

Fitzgerald River National Park has numerous ephemeral swamps, particularly on the plains. They are covered wholly or largely by woodland and/or shrubland. At least part of their floor is covered by a few centimetres of water during winter and spring. Floods may add up to 1.5 metres of water which may remain for up to 18 months. Water quality varies from fresh to brackish. A number of fresh (eg. Pabelup Lake) and saline (eg. Doggers Swamp) wetlands also occur.

All major rivers in Fitzgerald River National Park terminate in inlets which are normally closed to the sea by a sand bar. Only occasionally is river flow sufficient to fill any of the inlets so they overflow into the sea. Once open, inlets remain so for days to many months.

The majority of surface and groundwater in the park is saline. However, a thin layer of freshwater, overlying brackish or saline water, is likely to be present in the coastal sediments.

3.3 (c) Outstanding natural features, including caves

- Fitzgerald River National Park is one of Australia's richest conservation reserves for plants and animals. It is also an extremely important remnant, as much of the south-west has been cleared for agriculture. Some 20% of the known plant species of Western Australia occur within the 0.1% of the State occupied by the Park. At least 75 of these occur only within the Park. The Park also contains threatened animals and plants (see 3.1(d) above).
- The Fitzgerald River National Park landscapes, with extensive vistas showing little to no evidence of human occupation or use, are a major attraction.
- The park has a rich cultural history with numerous sites of historical and archaeological importance.
- The park is one of only two international biosphere reserves in Western Australia. The biosphere reserve values are enhanced by local community interest in the Park, and local adoption of the biosphere reserve concept.
- Fitzgerald River National Park provides a range of recreation opportunities in a natural setting.
- The park is well-placed to attract tourists travelling in the south-west and south-east of the State.

3.3 (d) Gradient (or depth range if action to be taken in a marine area)

The five major landforms are the upland, plains, incised valleys, ranges and dunes:

- The upland is characterised by a gently undulating terrain on the Archaean granites which underlie the northern part of the Park.
- The plains, immediately inland from the coast, are flat, with numerous swamps, depressions and large areas with no run-off. They are developed on the deeply weathered Plantagenet Group of Eocene sediments. This is the most extensive landform in the Park.
- Steep-sided valleys cut through the plain, creating the distinct, incised valley landform. The erosional scarp of the valleys is often capped by laterite. Flat mesaform hills also appear as relics on the plain.
- The ranges landform is also distinctive as it is emergent above the gently sloping plain. It has developed on the Proterozoic quartzites. Narrow sand dune systems occur along several sections of the coastline.
- The coastal dunes are readily eroded by wind, particularly when sparsely vegetated, or where wave action is likely to further decrease stability. The steeper, younger, more sparsely vegetated dunes closer to the coast are more susceptible than older stabilised dunes further inland.

3.3 (e) Buildings or other infrastructure

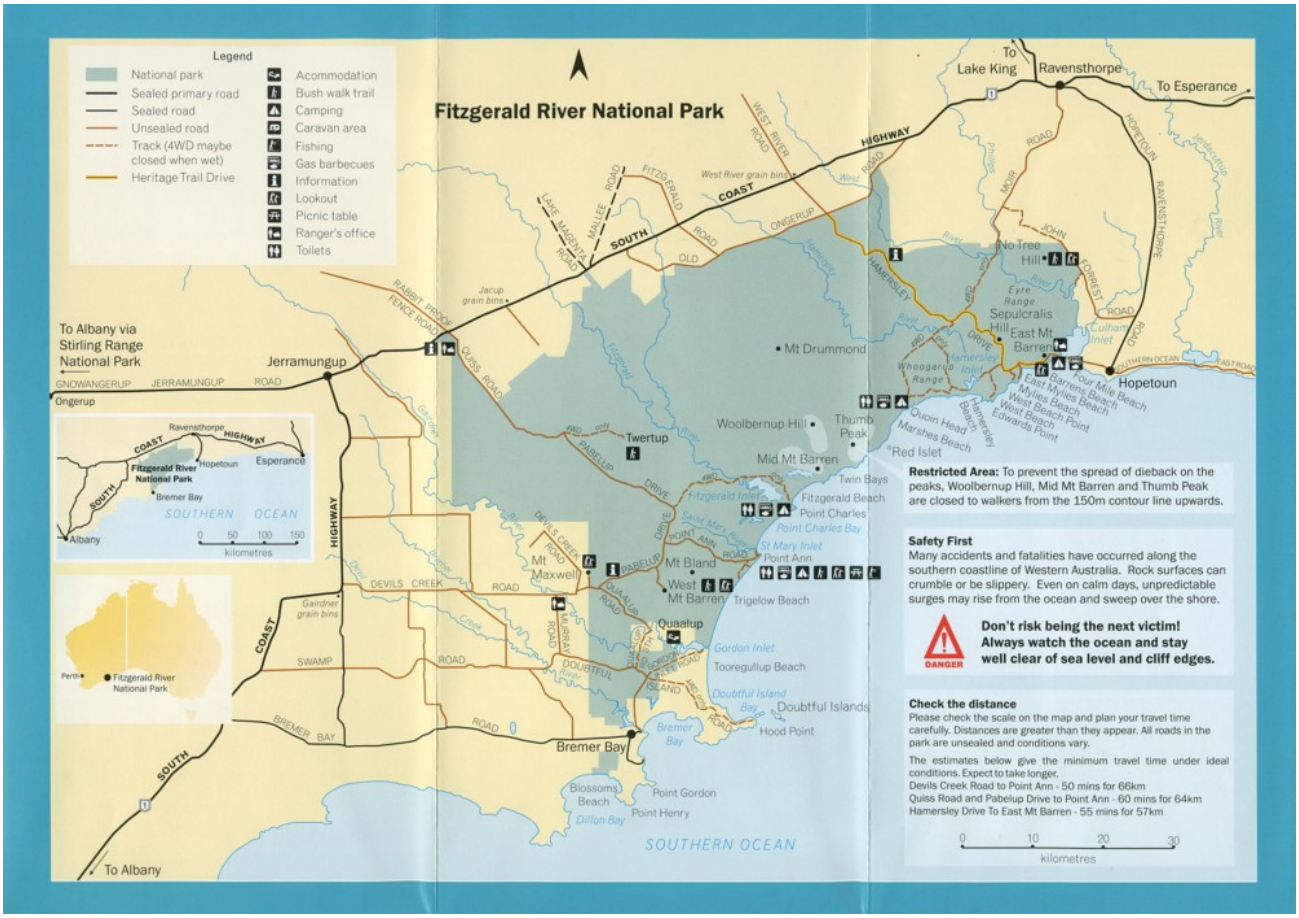
Historic buildings and infrastructure

- John Wellstead squatted at "Quaalup". He built Quaalup homestead, which is located just outside the park's boundary, in 1858. Ruins of a shepherd's hut, built by the Wellsteads, still remain near Fitzgerald Inlet. Ruins of various homesteads, including the Parsons, King, Neil and Waters families, can be found in the eastern end of the park.
- The Western Australian section of the East/West Telegraph Line was completed in 1877 after commencement in 1875. The Bremer Bay station was closed down in 1929 when the telegraph line was re-routed inland from Balladonia direct to Perth.
- The remains of a copper and manganese mine on Copper Mine Creek are still visible. The remains of an early twentieth century (c. 1910-1920) head frame, associated with the search for oil, are located near Jonacoonack on the Fitzgerald River. Nearby are a number of hut sites and a small dam.

- The No. 2 Rabbit Proof Fence was completed in 1905. It was abandoned in the 1960s, with the length between Nyabing and Point Ann being the last persisting section. Although no longer functional, parts of the fence still remain in the park (L. Sandiford, 1988).
- A small house, formerly the Twertup Field Study Centre, was built from spongolite at a quarry site in the park, but has now been destroyed by fire.
- The remains of a large concrete trough used for cleaning salmon can still be seen at Fitzgerald Inlet.

Recreation Facilities

There are about 28 recreation sites currently used in the park. Of these, 11 are used for both day use (parking and/or picnicking) and overnight camping, 13 for day use only and 4 for camping only (see map below). Some facilities have been damaged by fire in recent years and are being progressively replaced.



3.3 (f) Marine areas

There are no marine reserves located off the coast of the Fitzgerald River National Park. The 1994 Report of the Marine Parks and Reserves Selection Working Group recommended that "the area of State coastal waters between the mouth of Gordon Inlet and the mouth of Culham Inlet, should be considered for reservation as a marine reserve for conservation of flora and fauna and recreation, and that it should be added to the Fitzgerald Biosphere Reserve". No action has yet been taken on this recommendation.

3.3 (g) Kinds of fauna & flora

Flora

With 1,748 identified plant species, including 75 endemics, the Fitzgerald River National Park is one of the richest flora conservation areas in Western Australia. The park contains 20% of known plant species (both named and unnamed) for Western Australia and 42% of the known species for the South-West Botanical Province. The number of species will continue to increase as survey continues.

The Fitzgerald area is one of three nodes of high species richness in south-west Australia. Fitzgerald River National Park also has a high proportion of endemic, geographically restricted and rare species. Although the flora is typical of the Eyre Botanical District, it also contains some elements of the wetter forest and drier Goldfields flora (eg. *Gnephosis intosa* and *Ptilotus holosericeus*).

The flora of Fitzgerald River National Park consists of 5 families of fern and 87 of flowering plants. The major families represented are Myrtaceae (220 species), Proteaceae (130), Asteraceae (108) and Cyperaceae (97). Dwarf shrubs are the dominant life-form, followed by annuals and small shrubs.

The upland and plains contain the highest numbers of plant species. They are also the most extensive landforms identified in Fitzgerald River National Park.

In Fitzgerald River National Park, peak flowering occurs over August-November while the least number of species bloom in February. There is a rapid decline in the number of species flowering through the summer months. The most important summer flowering group is the eucalypts. Autumn-flowering species such as *Hakea laurina*, *Dryandra quercifolia* and Banksia media are important for the survival of honeyeaters and honey possums.

Fauna

The park has more species of vertebrate fauna than any other conservation reserve in south-west Australia. It has 22 species of native mammals (7 declared rare), 184 species of bird (3 declared rare and 2 declared as otherwise in need of special protection), 41 species of reptile (1 declared in need of special protection), 12 species of frog and 4 species of inland fish.

The very high number of vertebrates present is partially due to an overlap of arid region species and those adapted to moister conditions. The park also forms part of a corridor of uncleared vegetation from the coast to the southern wheatbelt and Goldfields. The large size of the park and lack of widespread habitat degradation, such as frequent burning and grazing by stock, enhance these values. Habitats can be degraded by dieback.

There is a concentration of rare fauna in the northern upland. This faunal richness is associated with three factors. First, the upland corresponds with the Archaean shield which underlies much of the wheatbelt. Much of the fauna is a remnant of a formerly widespread and richer wheatbelt fauna. Second, habitats exist in a tight mosaic of soil/vegetation types due to the presence of granitic outcrops and numerous minor watercourses. Third, some of the soils are not as extensively weathered and leached as those on the southern plains, and thus have a higher nutrient status.

Therefore, the northern part of Fitzgerald River National Park is a small remnant of a formerly widespread and rich faunal area. Today, it is likely that species continue to disperse, perhaps via river valleys, from the upland to the southern plains and elsewhere.

3.3 (h) Current state of the environment in the area

Fitzgerald River National Park is a 330,000 hectare area of natural vegetation in excellent overall condition, which is protected by its tenure as a A Class reserve for the purpose of national park.

The major management concern in the park is the spread of *Phytophthora cinnamomi* (dieback). The flora is highly susceptible to the disease, and this problem is compounded by summer rainfall which provides warm, moist conditions favourable to the survival and spread of *Phytophthora*. *Phytophthora* is most commonly introduced and spread in infected soil, mud or moist gravel on the wheels and underbodies of vehicles. Loss of vegetation to dieback would seriously reduce the park's conservation and recreation values.

The future of the rare fauna is also a management concern. A number of these species appear to have very specific habitat requirements, such as periods greater than 15 years between fires and protection from introduced predators such as foxes.

There is also concern about the effect of large-scale fires on the park's ecological and landscape values, as well as on adjoining farmlands and nearby towns. Fire has been a feature of the park's history over the last 40 to 50 years with some large fires burning significant areas of the park.

Another major issue is the increasing demand for visitor access to the coast for fishing, camping and beach activities. Many parts of the park, and especially the coast, are fragile and access needs to be managed to provide for enjoyable visitor experiences whilst minimising visitor impact.

3.3 (i) Other important or unique values of the environment

See above.

3.3 (j) Tenure of the action area (eg freehold, leasehold)

The area of the proposal lies mainly within the Fitzgerald River National Park. The roads to be sealed exit the park into Local Government Authority road reserves. The proposed walk trail lies within the Fitzgerald River National Park and other Crown reserves.

3.3 (k) Existing land / marine uses of area

The majority of the area is a national park and is used predominantly for a range of low-key recreational activities. The park is surrounded by farmland, townships and other Crown reserves. The coast is not heavily utilised due to its relative remoteness, with limited marine usage at present, mainly by recreational and commercial fishers.

3.3 (l) Any proposed land / marine uses of area

As an A class reserve for the purpose of “national park”, the tenure of the park is secure and non-conforming uses are not permitted. The State waters adjacent to the park may be considered for marine reservation in the future.

4 Measures to avoid or reduce impacts

In the development of a detailed project proposal, significant impacts to threatened or migratory species listed under the EPBC Act will be avoided by ensuring the alignment of roads and tracks does not cause significant impacts. During the development of the detailed proposal, on-site survey of the proposed areas will be undertaken to determine the location of conservation significant and threatened species so that those areas are avoided. If amendments to road alignments are required to enable compliance with Australian Standards for roading, the proposal and adjusted alignment will be subject to protection of significant protected flora and fauna populations and habitat to ensure minimal impacts to these values.

The Main Roads Environmental Management System will be implemented and is integrated into all key processes including planning, delivery, maintenance, network operations and supporting services. Main Roads seeks to maintain certification to ISO 14001:2004.

In addition, the proposal will be implemented in a manner consistent with relevant DEC policies including *Management of Phytophthora and disease caused by it, Policy No. 3*; *Recreation, tourism and visitor services, Policy No. 18*; *Visual resource management on lands and waters managed by the Department of Conservation and Land Management, Policy 34*; *Road management, Policy 40* (in review); *Visitor Risk Management Policy, Policy No. 53*; *Identification of Wilderness and surrounding areas, Policy 62*.

Environmental management protocols will be implemented to ensure that road and facilities construction follow best practice and are carried out in a manner that minimises environmental impact.

Vegetation and fauna habitat management

- Special environmental areas (for instance, containing threatened species under the EPBC Act; declared rare, priority or significant flora, areas of priority and protected fauna habitat under Western Australian legislation; wetlands etc) will be mapped during the design phase and road alignment and facilities will be designed to avoid them.
- Special environmental areas will be clearly delineated on site prior to commencement of construction to avoid unintentional impacts.
- Facilities will be designed to avoid clearing of vegetation.
- If clearing of vegetation is required, appropriate authorisation will be obtained and flora surveys will be undertaken.
- If clearing of vegetation is required, road alignments and facilities will be designed to minimise the amount of clearing required and avoid clearing areas containing threatened species under the EPBC Act, declared rare, priority or significant flora and areas of priority and protected fauna habitat.
- Opportunities to translocate flora, particularly threatened species under the EPBC Act, declared rare, priority or significant flora, will be investigated if clearing of vegetation is unavoidable. No clearing of conservation significant flora (including EPBC Act listed flora) will be undertaken where this significantly affects the conservation status of the species.
- The limits of clearing will be clearly demarcated on site prior to commencement of construction, to avoid unintentional clearing of vegetation.
- Any areas disturbed during construction that will not have infrastructure located on them will be rehabilitated with local species.
- Logs and dead trees will be retained for fauna habitat, providing safety requirements are met.
- Construction materials will be obtained from outside Fitzgerald River National Park where possible. If materials are required from within the park, these are to be obtained from existing gravel or sand pits.

Dieback and weed management protocols

- An example of a disease action plan developed for use by the western ground parrot research team in Fitzgerald River National Park is provided (Attachment 7).
- The response plan for the management of *Phytophthora cinnamomi* in the Fitzgerald River National Park 2006 – 2011 applies.
- A dieback and weed hygiene management plan will be developed to include the following aspects:
  - Construction will be undertaken in summer/ autumn to minimise the risk of dieback spread.
  - The development area will be surveyed and mapped to inform road alignment and recreation facilities design.
  - All vehicles, machinery and equipment will be clean on entry to the Fitzgerald River National Park.
  - All materials imported into Fitzgerald River National Park will be clean of dieback, weeds and weed seeds.
  - Dieback uninterpretable areas will be clearly identified on site and vehicles and machinery will not be permitted to move from these areas to dieback-free areas.
  - Clean-down stations will be installed at appropriate locations (away from special environmental areas) to prevent the introduction of dieback.
  - Weeds will be surveyed prior to construction.
  - Weed control will be undertaken during and following construction to manage any weeds resulting from construction disturbance. Weed control will be planned to prioritise the use of non-herbicide methods if possible, or to apply appropriate herbicides and rates if required.
  - Stockpiles, if required, are to be located within cleared areas and within the construction zone and are to avoid special environmental areas.
  - Stockpiles are to be treated for weeds if necessary.
  - Monitoring of dieback and weed spread will be undertaken following construction and appropriate mitigation will be undertaken if dieback or weeds are found to have spread.

Visual landscape management
- Design of the roads and facilities will take into account the visual landscape values of the area and seek to minimise the impact of constructed facilities.
- Design will be undertaken to maintain the aesthetic values of roads and facilities.

Access management
- Fencing or suitable barriers should be installed and maintained during construction to manage uncontrolled and unauthorised access from the construction site.

Fire management
- A fire access and management plan will be prepared to minimise the risk of fire from construction.

Drainage management
- Drainage will be designed to minimise the impact of stormwater on adjacent vegetation, and minimise the spread of dieback.
- Drainage will not be directed into natural wetlands.
- Actions will be implemented to control run-off and erosion from the construction site.

Cultural heritage
- Areas containing Registered Aboriginal sites or sites on the State Register of Heritage Places will be mapped and the road alignment and facilities will be designed to avoid these areas.
- If clearing of vegetation is required, surveys of these areas would identify any archaeological or ethnographic sites within or near the proposed area of disturbance and best practice management protocols would be applied, including appropriate consultation with elders in the event a cultural heritage site is discovered.

- Should an impact on a Registered Aboriginal site or a site on the State Register of Heritage Places be unavoidable, appropriate approvals will be sought under the *Aboriginal Heritage Act 1972* and the *Heritage of Western Australia Act 1990*.
- If cultural heritage sites are discovered during construction, works will be stopped immediately and appropriate archaeological and/ or ethnographic surveys and consultation with elders will be undertaken.

Construction management
- Dust will be managed by avoiding unnecessary clearing and applying water if required.
- Contractors will be required to dispose of any construction waste or other rubbish off-site.
- Appropriate incident reporting protocols will be established.

Training and site inductions
- All personnel involved in working on site will be appropriately trained and inducted about the values of the area and environmental protocols that are to be met.

Cumulative and/or consequential impacts
- The current park management plan contains principles that the management goal for Fitzgerald River National Park is to conserve all flora and fauna, particularly rare species and those in need of special protection, and to fulfil the nature-based recreation requirements of visitors to the extent that they are compatible with conserving the park's flora and fauna. It also refers to specific limits on camping numbers and booking systems. These objectives will be continued in any reviewed management plan and, even though the action may result in increased visitor numbers to the park, DEC will continue to manage the park to ensure there are no increased detrimental impacts on species listed as threatened under the EPBC Act, or other matters of national environmental significance.

Conclusion

Management of the impact of visitors on the Fitzgerald River National Park will be improved as a consequence of this proposal. In Fitzgerald River National Park, poorly located access routes and camping areas in coastal areas are leading to localised water and wind erosion. Inland, erosion is largely restricted to tracks and firebreaks. Experience in other areas of the south-west has shown that *Phytophthora* spore survival is minimised on well-drained, hard-surfaced roads. They limit the opportunity for infected soil to be picked up or spread by vehicles. The construction of suitable car parks and recreation facilities at the end of upgraded roads will aid management of any adverse impacts that may be expected from an increase in visitation to Fitzgerald River National Park. The construction of the coastal walk trail will formalise an existing less-formal walking route. The trail will improve management of walkers through the area by provision of better information to encourage minimal impact activity as well as improved trail alignment and camping facilities.

5 Conclusion on the likelihood of significant impacts

Identify whether or not you believe the action is a controlled action (ie. significant impacts on the matters protected under the Act are likely) and the reasons why. If you think that the action is a controlled action, you must also identify the relevant protected matters in section 5.3. (An action is a controlled action if it has, will have, or is likely to have a significant impact on a matter protected by a provision of Part 3 of the EPBC Act).

5.1 Do you THINK your proposed action is a controlled action?

✓	No, complete section 5.2
	Yes, complete section 5.3

5.2 Proposed action IS NOT a controlled action.

The Western Australian Government considers that this proposal does not constitute a 'controlled action', as defined by the EPBC Act, in that it:

- does not have any potential to affect:
    - World Heritage properties;
    - National Heritage places; and/or
    - wetlands of international importance;
- is not a nuclear action;
- does not impact Commonwealth land; and
- is not being implemented by a Commonwealth agency.

While there are listed threatened and migratory species within the proposal area, the proposed actions will be undertaken following strict protocols to protect those values. In addition, the proposed road works are based on utilisation of existing unsealed roads which are therefore already disturbed sites.

This proposal will result in an improved environmental outcome by:

- improving management of visitor access to the park; and
- minimising the threat of the spread of infection by *Phytophthora*;

In addition, the proposal will increase the reliability of access to the park for visitors and tour operators by providing year-round guaranteed access and better facilities for visitors.

6 Environmental history of the responsible party

NOTE: If a decision is made that a proposal needs approval under the Act, the Minister will also decide the assessment approach. The EPBC Regulations provide for the environmental history of the party proposing to take the action to be taken into account when deciding the assessment approach for actions that need approval under the Act.

		Yes	No
6.1	**Does the party taking the action have a satisfactory record of responsible environmental management?** **Provide details** The Department of Environment and Conservation's mission is: "Working with the community, we will ensure that Western Australia's environment is valued, protected and conserved, for its intrinsic value, and for the appreciation and benefit of present and future generations." (DEC 2007). The department has the lead responsibility for protecting and conserving the State's environment on behalf of the people of Western Australia (DEC 2007). This includes managing the State's national parks, marine parks, conservation parks, State forests and timber reserves, nature reserves, marine nature reserves and marine management areas (DEC 2007). The department maintains and adds to the conservation values of parks while providing opportunities for people to experience WA's remarkable and varied natural environments (DEC 2008). DEC employs experts and specialists with high level skills in such areas as *Phythophthora* dieback mapping and management. Main Roads has a wealth of specialised knowledge relating to the design and construction of roads and bridges and management of associated environmental aspects (Main Roads 2009). This expertise has been used to develop guidelines, standards and specifications for use by internal staff, and external consultants working for Main Roads (Main Roads 2009). This specialised knowledge plays an important part in the planning, design, construction and maintenance of Western Australia's road network (Main Roads 2009). The Western Australian Government operates in accordance with strict policies and guidelines as described in this document.		
6.2	**Has the party taking the action ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?** Not applicable. **If yes, provide details**		
6.3	**If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?** Not applicable.		

If yes, provide details of environmental policy and planning framework

6.4 Has the person proposing to take the action previously referred an action under the EPBC Act? ✓

Main Roads Western Australia has previously referred an action under the EPBC Act.

Provide name of proposal and EPBC reference number (if known)

2009/4692	Main Roads Western Australia/Transport - land/City of Mandurah, 3km N-East of Mandurah Post Office/WA/Construction of Mandurah Entrance Road	06 Jan 2009
2007/3515	Main Roads Western Australia/Transport - land/Busselton/WA/Monaghan's Roundabout Project - Intersection of Bussell Highway and Caves Road, Shire of Busselton	25 Jun 2007
2005/2193	Main Roads Western Australia/Land transport/Perth to Bunbury/WA/Construction of New Perth Bunbury Highway project	28 Jun 2005
2002/846	Main Roads Western Australia/Land transport/Caves Road/WA/Three Turning Pockets West of Busselton Townsite	25 Oct 2002
2002/781	Main Roads Western Australia/Tourism, recreation and conservation management/Canning Vale/WA/Translocation of orchids (Caladenia huegelii) from Roe Hway Reserve	27 Aug 2002
2001/470	Main Roads Western Australia/Land Transport Infrastructure/Armadale/WA/Tonkin Highway Extension	10 Oct 2001
2001/325	Main Roads Western Australia/Land Transport Infrastructure/South West Region/WA/South Western Highway - Wokalup to Brunswick Junction - Upgrade	20 Jun 2001
2000/83	Main Roads Western Australia/Land Transport Infrastructure/Shark Bay/WA/Useless Loop Road Upgrade	14 Nov 2000

7 Information sources and attachments

(For the information provided above)

7.1 References

Department of Conservation and Land Management (CALM). 1991. Fitzgerald River National Park Management Plan 1991 – 2001. Management Plan No 15. Government of Western Australia, Perth WA.

Department of Environment and Conservation (DEC). 2007. Corporate Plan 2007-2009. Government of Western Australia, Perth WA. [http://www.dec.wa.gov.au/about-us/about-dec/corporate-plan.html accessed 22 May 2009]

Department of Environment and Conservation (DEC). 2008. Annual Report 2007-2008. Government of Western Australia, Perth WA. [http://www.dec.wa.gov.au/about-us/annual-reports/dec-annual-report-2007-2008.html accessed 22 May 2009]

Main Roads Western Australia. 2009. Main Roads website: [http://standards.mainroads.wa.gov.au/NR/mrwa/frames/standards/standards.asp?G={E582C897-FF5E-4C02-8B46-51E88C1E5DD8} accessed 22 May 2009]

Marine Parks and Reserves.1994. Report of the Marine Parks and Reserves Selection Working Group

Giummarra, G.J. 2009. *Unsealed roads manual – Guidelines to good practice*. 3rd edition March 2009, ARRB Group Ltd, Victoria.

Department of Environment and Conservation. 2006. *Recreation, Tourism and Visitor Services Policy Statement 18* and associated guidelines. Government of Western Australia, Perth WA.

Department of Environment and Conservation. *Management of Phytophthora and disease caused by it, Policy No. 3*. Government of Western Australia, Perth WA.

Department of Environment and Conservation. *Visual resource management on lands and waters managed by the Department of Conservation and Land Management, Policy 34*. Government of Western Australia, Perth WA.

Department of Environment and Conservation. *Road management, Policy 40* (in review). Government of Western Australia, Perth WA.

Department of Environment and Conservation. *Visitor Risk Management Policy, Policy No. 53*. Government of Western Australia, Perth WA.

Department of Environment and Conservation. *Identification of Wilderness and surrounding areas, Policy 62*. Government of Western Australia, Perth WA.

Environmental Protection Authority. 2004. *Guidance Statement No. 56 Guidance for the Assessment of Environmental Factors - Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia*. Government of Western Australia, Perth WA.

Environmental Protection Authority. 2004. *Guidance Statement No. 51 Guidance for the Assessment of Environmental Factors - Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia.* Government of Western Australia, Perth WA.

7.2 Reliability and date of information

Management plan information has been cross checked by Department of Environment and Conservation staff in the region. Personal communication with key management staff in the region and staff who specialise in environmental impact management was undertaken.

7.3 Attachments

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)	✓	2a and 2b
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	2a and 2b
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.3)		
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.4)		
	copies of any flora and fauna investigations and surveys (section 3)		
	technical reports relevant to the assessment of impacts on protected matters and that support the arguments and conclusions in the referral (section 3 and 4)		
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)		

8 Contacts, signatures and declarations

NOTE: Providing false or misleading information is an offence punishable on conviction by imprisonment and fine (s 489, EPBC Act).

Under the EPBC Act a referral can only be made by:

- the person proposing to take the action; or
- a Commonwealth, state or territory government, or agency that is aware of a proposal by a person to take an action, and that has administrative responsibilities relating to the action[1].

Project title: **Road upgrades and walk trail development to and in Fitzgerald River National Park**

8.1 Person proposing to take action

Name	Keiran McNamara
Title	Director General
Organisation	Department of Environment and Conservation
ACN / ABN (if applicable)	ABN 38 052 249 024
Postal address	Locked Bag 104, Bentley Delivery Centre WA 6983
Telephone	(08) 6467 5500
Email	keiran.mcnamara@dec.wa.gov.au
Declaration	I declare that the information contained in this form is, to my knowledge, true and not misleading. I agree to be nominated as the proponent for this action.
Signature	Peter Thorp for K. McNamara Date 22/6/09

Name	Director, Parks + Visitor Services
Title	
Organisation	
ACN / ABN (if applicable)	
Postal address	
Telephone	
Email	
Declaration	I declare that the information contained in this form is, to my knowledge, true and not misleading. I agree to be nominated as the proponent for this action.
Signature	Date

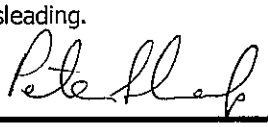
[1] *If the proposed action is to be taken by a Commonwealth, state or territory government or agency, section 8.1 of this form should be completed. However, if the government or agency is aware of, and has administrative responsibilities relating to, a proposed action that is to be taken by another person which has not otherwise been referred, please contact the Referrals Business Entry Point (1800 803 772) to obtain an alternative contacts, signatures and declarations page.*

8.2 Person preparing the referral information (if different from 8.1)

Individual or organisation who has prepared the information contained in this referral form.

Name	Peter Sharp
Title	Director Parks and Visitor Services
Organisation	Department of Environment and Conservation
Postal address	Locked Bag 104, Bentley Delivery Centre WA 6983
Telephone	(08) 442 0304
Email	peter.sharp@dec.wa.gov.au

Declaration: I declare that the information contained in this form is, to my knowledge, true and not misleading.

Signature:  Date 22/6/09

If the referring party is a small business (fewer than 20 employees), estimate the time taken, in hours and minutes, to complete this form (include your time reading the instructions, working on the questions and obtaining the information and time spent by all employees in collecting and providing this information).

Hours	Minutes

REFERRAL CHECKLIST

NOTE: This checklist is to help ensure that all the relevant referral information has been provided. It is not a part of the referral form and does not need to be sent to the Department.

HAVE YOU:

- ❑ Completed all required sections of the referral form?
- ❑ Included accurate coordinates (to allow the location of the proposed action to be mapped)?
- ❑ Provided a map showing the location and approximate boundaries of the project area?
- ❑ Provided a map/plan showing the location of the action in relation to any matters of NES?
- ❑ Provided complete contact details and signed the form?
- ❑ Provided copies of any documents referenced in the referral form?
- ❑ Ensured that all attachments are less than two megabytes (2mb)?
- ❑ Sent the referral to the Department (electronic and hard copy preferred)?