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PROPOSED SUBDIVISION

LOT 12 IRVINE ROAD METRICUP

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January, 2004

DEPARTMENT FOR PLANNING AND INFRASTRUCTURE BUNBURY OFFICE	
27 FEB 2004	
FILE	124631

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1.0 INTRODUCTION/BACKGROUND

This report is submitted by 'PLANSCAPE – Planning and Sustainability Consultants' on behalf of the owners of Lot 12 Irvine Road, – J and A Carter in support of the proposed subdivision of the subject land. The proposal submitted is consistent with the Development Guide Plan which forms part of Amendment No.57 to District Town Planning Scheme No.20 (DTPSN20) and proposes to rezone the property from 'Agriculture' to 'Bushland Protection' zone. This amendment is currently with the WA Planning Commission for consideration for final approval having been adopted for such by the Shire of Busselton in October, 2003.

The proposal has been submitted in response to the properties identification in the Shire of Busselton 'Biodiversity Incentive Strategy for Private Land in the Busselton Shire' ('the Strategy'). This Strategy was adopted by Council in April 2002 and endorsed by the WA Planning Commission in August 2002. The Strategy identifies Lot 12 Irvine Road as complying with the stated 'Biodiversity Value Criteria Assessment' and therefore being able to be considered for a subdivision incentive in exchange for protection of the high conservation values of the land in perpetuity.

It is the intention of this proposal to ensure the significant biodiversity values of Lot 12 are protected and enhanced in the longer term through both inclusion in the newly created 'Bushland Protection' zone and application of restrictive covenants over the property to maintain land use and management conducive to the sites unique characteristics.

This report will provide a comprehensive range of planning, environmental and other rationale for the proposal including compliance with the 'Bushland Protection' zone notwithstanding that the Strategy already identifies the property as complying with the criteria of such. Additionally this will include identifying areas for rehabilitation/revegetation, appropriate access arrangements and sensitively located building envelope areas. Importantly the proposal includes a detailed Bush Fire Management Plan consistent with the West Australian Planning Commission's (WAPC) 'Planning for Bush Fire Protection Policy'.

2.0 THE SUBJECT LAND

2.1 LOT AND LOCATION DETAILS

The 'Subject Land' comprises Lot 12 Irvine Road, Metricup being portion of Sussex Locations 4097 on Certificate of Title - Volume 2076/Folio 74. A copy of the Certificate of Title is shown as Attachment A of this report. The subject land is in the ownership of A and J Carter and comprises a total area of 77.8294 ha. It is located approximately 7km south of the Carbanup River townsite. Access is achieved via Irvine Road which intersects with Roy Road which connects with Bussell Highway 1.5km to the west. Plan 1 shows the general location of the subject land.

2.2 SITE DESCRIPTION

Lot 12 Irvine Road, Metricup is a unique property with nearly all of the 77.8ha being covered with native vegetation. The land slopes gradually up from the Yelverton Brook which runs along (and marginally within) the north west boundary of the property. The property rises from 55AHD in this area to 70AHD in the central/south east sector. That area adjoining the Yelverton Brook, and comprising much of the cleared area of the property is subject to inundation during winter, autumn and spring months.

As discussed high quality remnant vegetation covers nearly the entire property with the only cleared areas being in the northern corner, surrounding the existing

dwelling and outbuildings, a small area on the south western boundary and areas used for exiting access and/or fire breaks. The former cleared area, being the most extensive, comprises an area of approximately 4.4ha and was grazed intermittently until 1991. This area has naturally regenerated and will be subject to further rehabilitation as part of this proposal. Apart from these areas the property has never been used for agricultural or other purposes which has resulted in high conservation and biodiversity values being retained through the retention of remnant vegetation.

Access to the property is achieved via a 10m frontage to Irvine Road which has a 5-6m gravel based carriageway. Access from Irvine Road to the existing residence is achieved via a 4m wide, approximately 850m long gravel battleaxe leg. This battleaxe leg is well drained and constructed to a two-wheel drive standard. The existing dwelling is presently occupied by the owner of the property with approval for this being granted by the Shire of Busselton in 1996. This dwelling is serviced by bore (license for household and irrigation purposes - 1770ML) and underground power running along the southern boundary of the property.

The subject land is surrounded by a range of similarly well vegetated lots to the north and south with either predominantly cleared or partly vegetated properties to the north, north east and south west. The latter properties are utilised for a range of agricultural purposes though predominantly grazing with Lot 1 to the north west accommodating the Yelverton Brook Chalets. Plan 2 provides a vegetation assessment of the property in addition to showing the characteristics of Lot 12.

2.3 PLANNING CONTEXT

The subject land is zoned 'Agriculture' pursuant to the Shire of Busselton DTSPN20. This zoning effectively prohibits the subdivision of the subject land given the lot's size of 77.8ha and that the minimum lot size under the scheme for grazing and agricultural uses other than horticulture and viticulture is 40ha. The subject land has limited capability for more intensive forms of agriculture.

In addition to the broader designation and requirements of DTSPN20, the proposal will be assessed against a range of Shire and other government policies including the Shires Biodiversity Incentives Strategy, Rural Strategy, and the WAPC Planning for Bush Fire Protection Policy and Agricultural Land Use Planning Policy. The former Strategy, through its identification of the subject land as having high biodiversity values that meet the relevant criteria will provide a major part of the justification and assessment of the proposal given it provides the primary impetus for such.

2.4 ENVIRONMENTAL CHARACTERISTICS

2.4.1 Remnant Vegetation


Lot 12 is nearly entirely covered with native vegetation with some minor clearing existing in the vicinity of existing dwelling and structures and in the northern and south west section of the land. The majority of the lot comprises banksia woodland, significant areas of *Allocasuarina fraseriana* (sheoak) and *Agonis flexuosa* (peppermint) with some *Corymbia callophylla* (marr) and *Eucalyptus marginata* (jarrah). The most dominant vegetation complex is the Yelverton (Yd) complex which covers the majority of the subject land. It is however the Yelverton (Yw) complex found in the lower lying northern and north western areas of the subject land which is of most biodiversity significance (See Plan 2). This complex is identified as being *Poorly Represented* with only 29% of the original cover (ie. Pre-clearing) remaining. Given the majority of this remnant vegetation is in very good condition the reasons for inclusion of


PLAN 2

VEGETATION TYPE AND CLASS ASSESSMENT

Lot 12 Irvine Road, Metricup



Proposed Building Envelopes 

Poorly Represented Complex Yelverton (Yw) 



Existing Dwelling and Outbuildings

Vegetation Class Types

- 4 – Closed Forest
- 5 – Open Forest
- 6 – Woodland
- 7 – Open Woodland
- 9 – Low Open Forest
- 11 – Low Open Woodland
- 19 – Low Open Shrubland
- 22 – Tussock Sedgeland
- 26 – Sown Pasture

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the subject land as an area with high biodiversity values in the Shires Incentive Strategy are clear.

Notwithstanding this there is some evidence of weed incursion in a small cleared area on the south western boundary of the property, with these likely to have spread from the adjoining property to the south west where various weeds are prevalent. A program for eradication, control and monitoring of this weed will be outlined on the Weed and Pest Management Plan presented later in this report.

2.4.2 Yelverton Brook

Yelverton Brook runs along and partly bisects the subject land along the northern boundary. This area comprises extremely dense vegetation and is seasonally inundated in winter and spring months. The cleared area in the north of the property and to the east of the Yelverton Brook is proposed to be rehabilitated as part of the subject proposal.

2.4.3 Fauna

The predominance of peppermint woodland on the subject land offers ideal habitat to the endangered Western Ringtail Possum (*Pseudocheirus occidentalis*) in addition to a wide range of native fauna. A wide range of less critical native fauna occurs on the property including a numerous native and migratory bird species. The preservation of the habitat of the site's fauna through inclusion of the property in the 'Bushland Protection' zone and via a restrictive covenant is an important outcome to preservation of the long-term conservation values of the land. There is some evidence of rabbits on the property. There have been no sightings of foxes, cats or other feral animals on the property. Attention to these issues is provided in more detail in the Pest and Weed Management Plan section of this report.





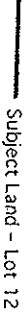
3.0 PROPOSED SUBDIVISION

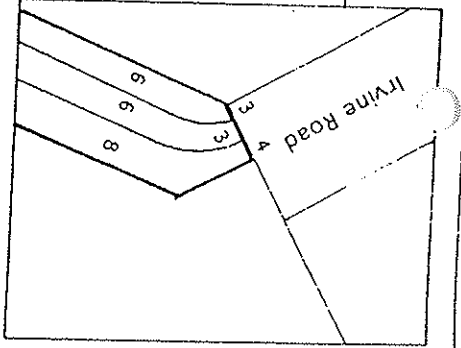
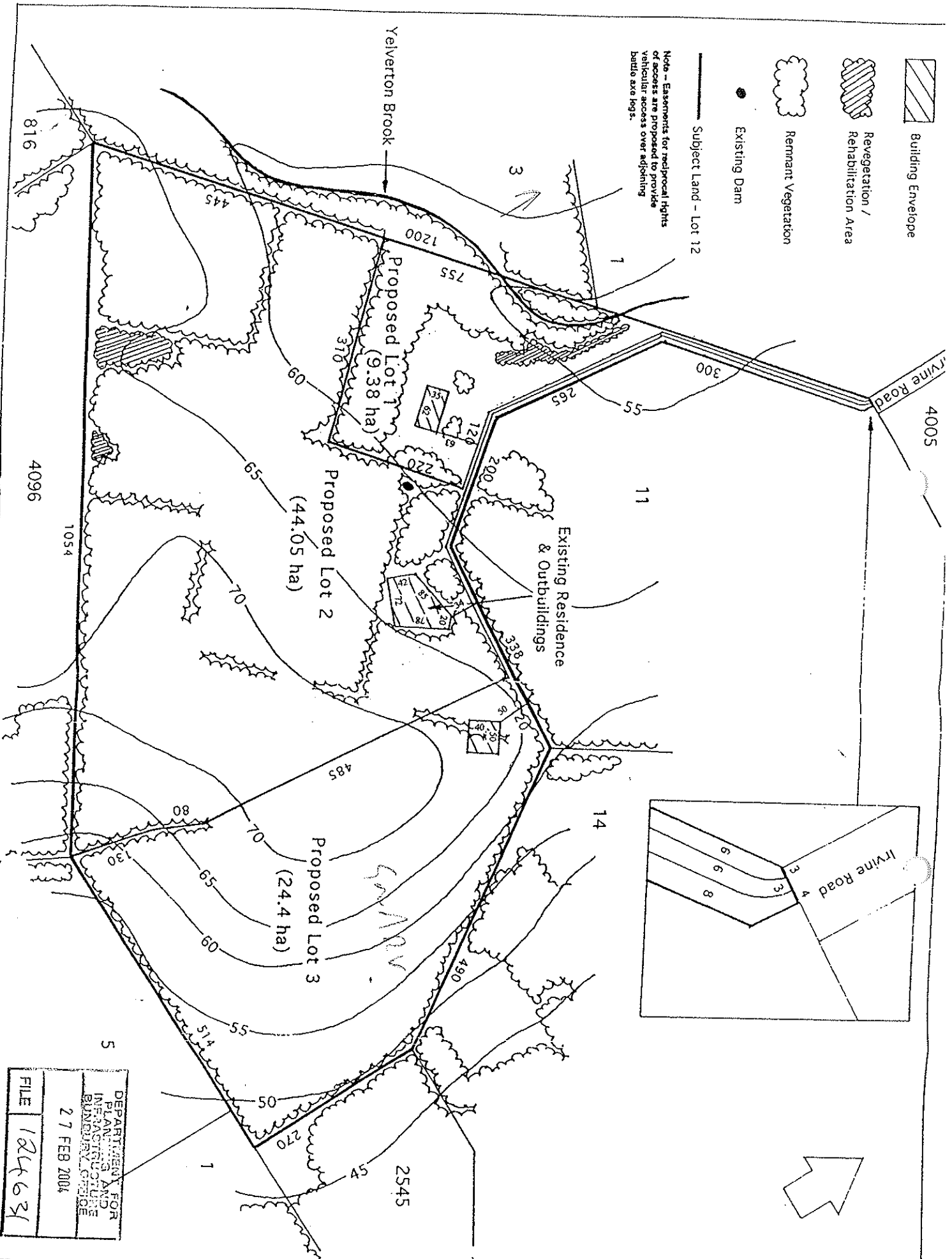
The proposed subdivision of Lot 12 Irvine Road, Metricup is reflective of the Development Guide Plan adopted as part of Amendment No.57 DTSPN.20 and is shown as Plan 3. It is proposed to create two additional lots for a total of three lots. Proposed Lot 1 is the smallest of these (9.38ha) essentially comprising the major cleared area in the north of the property. Proposed Lot 2, containing the existing dwelling is proposed to accommodate the majority of the remnant vegetation on the property within an area of 44.05 ha. Proposed Lot 3 comprising 24.4ha would also accommodate predominantly remnant vegetation. This subdivision design, associated access and building envelope location has been designed to achieve the most sensitive and sustainable outcome for the property from a conservation perspective whilst ensuring other key issues such as bush fire protection are also satisfied. The key components of the plan and the planning and environmental rationale behind them are described below:

Lot Configuration

It is acknowledged that there is a preference for a clustered subdivision approach in the 'Bushland Protection' zone of the Shires DTSPNo.20 and the Biodiversity Incentives Strategy. This has been achieved to some degree in the proposed design with proposed lot 1 being of a smaller area (relatively) and located in a predominantly cleared area to ensure no clearing occurs as part of building or access construction. It was not possible to cluster all lots or building envelopes in this cleared area given:

Note - Easements for reciprocal rights of access are proposed to provide vehicular access over adjoining boundary side legs.

-  Building Envelope
-  Revegetation / Rehabilitation Area
-  Remnant Vegetation
-  Existing Dam
-  Subject Land - Lot 12



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PLAN 3
PROPOSED SUBDIVISION
 Lot 12 Irvine Road, Metricup



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Scale 1 : 5000
 Client J & A Carter
 Date December 2003

envelope on proposed Lot 3 would greatly assist in the management and practicality of residing on the subject lot in the future.

Access

All lots are proposed to gain access from Irvine Road via an existing battle-axe leg. Lots 1 and 2 will have a 3m frontage with 6m wide battleaxe legs and proposed lot 3 will have a 4m frontage with an 8m battleaxe leg. Right of carriageway easements for common access of these legs will be applied to all lots as part of subdivision approval. The existing track is located in the widest proposed battleaxe leg being that for proposed lot 3. This access leg is proposed to be upgraded to a 5m wide gravel formation from Irvine Road to the end of the narrow section of the access leg within proposed Lot 1 with 6m wide passing bays every 200m in accordance with Council specifications.

Servicing

Sufficient electricity supply exists on the property to service the proposed new lots with an underground supply presently servicing the existing dwelling.

Substantial water supply exists on proposed lot 2 servicing the existing dwelling. Additional tanks to supply a total of 135 kilolitres consistent with the provisions of the 'Bushland Protection' zone will need to be provided as part of future residential development on the 2 proposed additional lots.

Effluent disposal will be via standard septic systems for proposed Lots 1 and 3 given that there is a significant depth to groundwater due to the elevated nature of the chosen building envelope locations and is consistent with the system utilised as part of the existing dwelling.

3.1 Pest and Weed Management Plan

Weed Management

An investigation of the subject land indicates that it is predominantly free of weeds this concurring with the Shire of Busselton's assessment of the property as having vegetation of a "Very Good" nature. The only weeds identified and historically known to occur are some Penny Royal (*Mentha Pelugium*) in the degraded area on the south west boundary of Proposed Lot 2 and other pasture weeds (none declared) in the cleared area in the north of the subject land. This incursion is likely to have originated from the open pastureland on adjoining farming properties.

PennyRoyal is no longer a Declared Plant in the Busselton Agricultural Region. Notwithstanding this, it is still proposed to systematically eradicate the pennyroyal weed from the property by the annual application late in the weed season (ie January/February) of roundabout at a low dosage. The careful application of this poison will ensure most of the existing seed is destroyed prior to the growing season (ie Winter/Spring). Combined with native revegetation of this area the eradication of this weed should occur within a 2-3 year period and be sustained from there dependent on the success of the revegetation. This program will be implemented as part of subdivision and the subsequent Restrictive Covenant.

Pest Management

The only recorded pests on Lot 12 are rabbits with low populations being scattered around various areas of the property. A number of rabbit control options have been discussed for the property with the local Agriculture WA office. The most effective and sensitive option for this property has been determined as being warren fumigation. Fumigation is considered the best method to use when a low population of rabbits live in widely scattered warrens or inaccessible areas. Fumigant tablets (commonly Phostoxin®) will be placed in burrows to release

- i) There are very limited areas to locate building envelopes given the low-lying and inundated nature of this area. The envelope on proposed Lot 1 is the only area not subject to such inundation in this sector of the lot apart from heavily vegetated areas which are predominantly within the Poorly Represented Yelverton (Yw) Vegetation Complex.
- ii) The size of the property makes it difficult to configure a rational lot design around such a small, wet and cleared area particularly when there are other more suitable locations for such.
- iii) It would not be practical or realistic from a land management perspective to place the entire (or vast majority) of the remnant vegetation within one lot. Such a scenario would result in approximately 70ha of bushland being managed, maintained and enhanced by one landowner. It would clearly be more sustainable to share this responsibility to some degree between landowners, where the other principles of clustering can still be achieved.

The ability to provide a total cluster approach is further constrained by the existing dwelling on the lot. Notwithstanding this, the lot boundaries have been designed to align with existing firebreaks or tracks, limiting the possibility of any vegetation disturbance as part of any boundary demarcation (notwithstanding that only post and wire fencing is proposed). Additionally, the principles of clustering are further achieved in this proposal as all proposed lots will be included in the 'Bushland Protection' zone and have restrictive covenants.

Building Envelopes

Building envelopes are proposed within the three lots. The building envelope for proposed lots 1 and 3 have been sensitively located and each comprises an area of 2000sq.m. These envelopes are marginally larger (by 500sq.m) than the guideline outlined in the Biodiversity Incentives Strategy. Justification for this is provided in the following.

The building envelope for proposed Lot 1 has been located in a cleared part of the property to minimise the impact on remnant vegetation as part of building construction and other domestic areas. The provision of a 2000sq.m building envelope in comparison to a 1500sq.m envelope will have no additional impact given this cleared nature. Other parts of proposed lot 1 were considered for location of the building envelope however areas further to the north were inundated for much of the year and therefore not ideal for development of a residence. The balance of the lot comprises remnant vegetation, much of which is part of the poorly represented Yelverton(Yw) complex and is also therefore not suitable for development.

The building envelope for proposed Lot 2 as discussed, accommodates an existing dwelling, sheds and domestic areas.

The building envelope for proposed lot 3 is located in an area where the vegetation is relatively scattered (and partly cleared due to a 4m fire break bisecting the envelope) and in a location close to the access from the proposed battle-axe leg. This is to ensure minimisation of clearing particularly with relation to that required for vehicular access purposes. The partly cleared nature of this area ensures only minimal impact on vegetation as part of a larger building envelope.

In addition to this, it is suggested that a larger building envelope for this proposed lot be supported on the basis that it will have such a negligible impact on a lot that comprises over 24ha of high quality vegetation. An indication of a practical envelope size for such a large lot can be evidenced by the existing envelope area on Lot 12. This area, comprising 4400sq.m is fully utilised for dwelling, access and other domestic purposes including areas relating to management of such a large remnant. This includes sheds for machinery for fire and access maintenance in addition to rehabilitation works (ie fencing, planting). Provision of a slightly larger

poisonous phosphine gas. Both the nature of the rabbit population on Lot 12 (ie being scattered and burrowing) and the fact that fumigation has minimal impact on native and other animal species has determined this to be the most appropriate method. Other effective rabbit control methods such as 1080 and Pindone baits have not been pursued given the impact they can have on native animal populations. Ripping of rabbit warrens has also been discounted as an option given the major impact it would have on the native vegetation.

Fumigation can be carried out at any time of year but it has the greatest long-term effect if done shortly before the commencement of the rabbit breeding season. As such it is proposed to annually implement the program in April/May.

Static fumigation will be the method of fumigation. This is done by placing fumigant tablets down each warren entrance. The main fumigant used is phosphine, which is released from aluminium phosphide tablets by reaction with moisture.

This program will be implemented as part of subdivision approval and the proposed restrictive covenant. Further consultation with Agriculture WA will also be required at those stages to determine the details of poison rates and area application

Revegetation/Rehabilitation

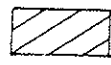
Whilst the majority of the subject land is of a high conservation value due to the extent and nature of the remnant vegetation, it is proposed to rehabilitate and revegetate an area in the northern corner of Proposed lot 1 and the south west boundary of Proposed Lot 2 with native vegetation. These areas are presently partly degraded with the latter adjoining the Yelverton Brook and the poorly represented Yelverton (Yw) vegetation complex. Additionally this area is subject to substantial inundation and would benefit from some revegetation. This revegetation would be detailed as part of a 'Rehabilitation/Revegetation Plan' prepared as part of subdivision approval and would also be include within the Management Plan within the restrictive covenant for the property. These areas are outlined on the Development Guide Plan.


4.0 BUSH FIRE MANAGEMENT PLAN


A comprehensive fire management plan was prepared and forms part of Amendment No.57 to the scheme. This was prepared in accordance with the WAPC 'Planning for Bush Fire Protection Policy'.


As part of the amendment a 'Type 3 Bush Fire Hazard Assessment Procedure' was undertaken in accordance with the "Planning for Bush Fire Protection" Policy Document. Whilst this assessment only related to the building envelope for proposed Lots 1 and 3 given Lot 2 already contains a dwelling, fire management proposals for all lots were formulated. As fully documented within the amendment No.57 report the assessment of average slope and vegetation classification in accordance with "Table 4: Type 3 Bush Fire Hazard Assessment Hazard Levels" results in the building envelope for proposed Lot 1 being classified as "High" and proposed Lot 3 "Extreme", the latter by virtue of its location abutting the predominant vegetation type/class.


On this basis the following bush fire protection measures are proposed in accordance with Part 3 of the "Planning for Bush Fire Protection" policy. Where applicable these measures are shown on the Bush Fire Management Plan shown as Plan 4.

 Building Envelope

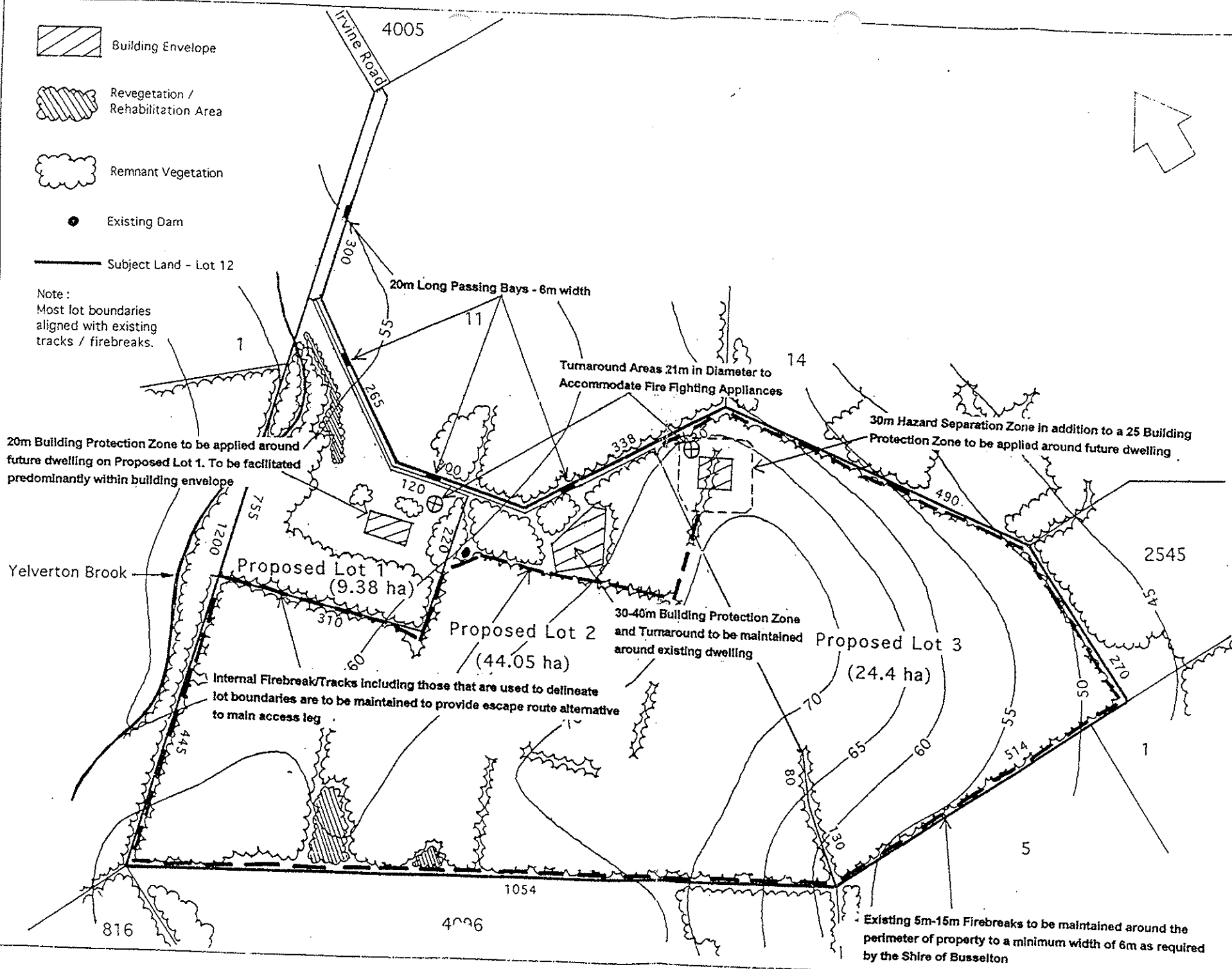
 Revegetation / Rehabilitation Area

 Remnant Vegetation

 Existing Dam

 Subject Land - Lot 12

Note:
Most lot boundaries aligned with existing tracks / firebreaks.



Scale 1 : 5000

Client J & A Carter

Date October 2002

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PLAN 4
BUSH FIRE PROTECTION
and MANAGEMENT PLAN
Lot 12 Irvine Road, Metricup

Fire Suppression Response

The subject land is located within the Jindong Bush Fire Brigade area of responsibility. Response time is estimated at 10-15 minutes.

Access

Vehicular access to all proposed building envelopes will be via an existing gravel paved (4m wide) track that is trafficable by two-wheel drive all year (this will be extended for Proposed Lot 3). This access is proposed to be upgraded as part of the subdivision of the land in addition to other access arrangements as follows:

- i) Provision of 5 passing bays approximately at 200m intervals along the proposed access/battleaxe leg from Irvine Road. These shall be a minimum 20m in length and pavement will be increased from 4m to 6m.
- ii) Two turnaround areas shall be constructed. One will be to the north east of the building envelope for proposed lot 1 and the second between the building envelope for proposed Lot 3 and the proposed battleaxe leg. These will be located within 50m of the proposed envelopes and be constructed to minimum diameter of 21m to accommodate 3.4 fire-fighting appliances. Proposed lot 2 has an existing turnaround area directly to the west of the existing dwelling.
- iii) A supplementary fire fighting access and escape route for all envelopes is proposed utilising existing firebreaks. These will effectively form an internal loop access/escape as an option to the existing track and other perimeter firebreaks which are all trafficable by 2WD in the fire season.

Water Supply

The 'Planning for Bush Fire Protection' Policy generally specifies that guidance for the provision of water supply for fire fighting purposes to be by the local authority. Given the size of the subdivision proposal (ie. A total of 3 lots) it is therefore proposed to provide a water supply via the requisite 135 000-litre tanks within each of the building envelopes for Proposed Lots 1 and 3. Access to and fitting of these tanks will be provided consistent with the Shire of Busselton specifications. In addition an existing dam in the north west corner of Proposed Lot 2. This will be fitted with a pump and will be available for fire fighting purposes. This soak provides a year round/permanent water supply and has a capacity of 30000 litres.

Hazard Separation and Building Protection Zones

Proposed Lots 1 and 2

Given the proposed building envelope for proposed lot 1 does not adjoin an area of 'extreme bush fire hazard', a Hazard Separation Zone is not required by the 'Planning for Bush Fire Protection' Policy. However Building Protection Zones consistent with the policy of 20m around future dwellings is proposed. The Building Protection Zones will:

- i) maintain bush fire fuels below 10cm in height
- ii) be cleared of any trees and branches which may fall onto a future dwelling and
- iii) have the lower branches of the remaining trees trimmed.

The existing dwelling on proposed Lot 2 has a building protection zone ranging from 30-40m. This will be maintained consistent with the above specifications.

Proposed Lot 3

The building envelope for proposed lot 3 has an extreme bush fire hazard. Accordingly a Hazard Separation zone is required for this envelope in addition to a building protection zone. The required total of these two zones as required by the WAPC Policy is 100m. Consistent with the Policy, a 20m building protection zone will be provided surrounding the dwelling. With regard to the hazard separation zone, advice has been provided by the WAPC and FESA that this can be reduced if a dwelling is constructed in accordance with Building Code of Australia Standard – AS3959. Based on this a reduced a Hazard Separation zone of 30m is proposed. This would involve the removal of vegetation within this zone to create a hazard reduced state. In the case of the proposed lot this would involve retention of a maximum of 15 trees (equivalent) per ha of the Hazard Separation zone.

Other Protective Measures

The final component of the Bush Fire Management Plan will be the maintenance of existing fire breaks around the perimeter of the proposed lots consistent with the Shire of Busselton requirements. As discussed the subject land presently has a substantial network of firebreaks, ranging in width from 5m to 15m. The most critical of these are shown on the Bush Fire Management Plan and includes a secondary internal firebreak, essentially around the proposed building envelopes. This, as with all firebreaks which are trafficable in the fire season will also act as an escape route alternative to the main access leg. Where required, firebreaks will be widened to a minimum width of 6m in accordance with Council requirements. Importantly, all existing internal fire breaks/tracks where aligned on proposed property boundaries will be maintained as part of the Fire Management Plan.

CONCLUSION

This Bush Fire Management Plan has been prepared in accordance with the WAPC 'Planning for Bush Fire Protection' Policy and the Shire of Busselton 'Bushland Protection' zone. As such it provides a satisfactory level of protection from bush fire for the future residences proposed to be located on Lot 12 Irvine Road in addition to improving that for the existing dwelling. This Bush Fire Management Plan will be enforced through the inclusion within the Restrictive Covenant which will apply to the property.

Importantly implementation of the management proposals outlined in this Bush Fire Plan will have a limited impact on the high conservation values of the land due to the minimal amount of clearing required. Conversely the protective measures outlined are likely to ensure a higher level of protection for these values in the longer term.

5.0 PLANNING JUSTIFICATION AND ASSESSMENT

5.1 STRATEGIC CONSIDERATIONS

Shire of Busselton Biodiversity Incentives Strategy

As discussed, this Strategy was adopted by the Shire of Busselton in April 2002 and endorsed by the WAPC in August 2002. This Strategy provides a clear framework for the application of various subdivision and other incentives for land complying with stated biodiversity criteria, in exchange for protection of such values in perpetuity through inclusion in the 'Bushland Protection' zone and application of restrictive

covenants. The Strategy outlines Assessment Criteria and Guidelines within which compliance or otherwise determines whether incentives apply to land parcels.

The Shire of Busselton undertook this assessment for the subject land as part of the formulation of the Strategy. As a result, the Shire and the WAPC through its endorsement have determined that Lot 12 fits the Biodiversity Value Criteria within the Strategy as outlined in Figure 9 of the aforementioned document. Appendix D of the Strategy outlines this assessment where it is stated that for Lot 12 Irvine Road - "Selection based on presence of a poorly represented community, and size of remnant. Also forms part of a wide chain of remnants along Gibb Road". A more detailed assessment of the Strategy confirms that the subject land complies with the following criteria as indicated by the Shire :

- Lots that contain at least 10 hectares of remnant vegetation that includes at least 5 hectares of a poorly represented vegetation complex or at least 3 hectares of an endangered vegetation complex and that is classified as being in good or better condition
- Lots that contain at least 20 hectares of remnant vegetation that is classified as being in good or better condition.

The existence of 11.5ha of the Yelverton(Yw) vegetation complex(see Plan 2) clearly satisfies the former point whilst the size of the remnant and confirmed high quality of the condition satisfies the latter.

As such the land qualifies for consideration for a Subdivision Incentive under Step 2 of the Strategy. Given the size of the lot is 77.8294ha the Potential Lot Yield Criteria applying to the subject land is "For lots of 40ha and greater and with a remnant vegetation cover of 50% or more of the total area of the lot, subdivision based on a ratio of one lot per 20ha with a maximum of 4 lots in total". This enables 3 lots in total to be considered on the subject land.

Consideration for this subdivision incentive is subject to compliance with Steps 3 and 4 of the Strategy. The subject land is exempt from Step 3 - Assessment Guidelines by virtue that it is identified as meeting the Biodiversity Value Criteria in the Strategy. With regard to Step 4 - Operational Guidelines the following Assessment is made in accordance with the stated requirements:

(1) the owner:

a. rezoning the portion of the subject lot proposed to be incorporated in a Conservation Lot to 'Bushland Protection' in accordance with the zoning requirements of this strategy; and

b. The owner entering into a Conservation Covenant with the National Trust, CALM or any other recognised covenanting organisation with an established stewardship program, to provide for the effective protection and management of all portions of the subject lot proposed to be incorporated into a Conservation Lot, in accordance with the covenanting requirements of this strategy.

Comment - The subject land is proposed to be included in the 'Bushland Protection Zone as part of Amendment No.57 in addition to covenanting with either CALM or the National Trust to ensure effective long term management of conservation and other values.

(2) there being no detrimental impacts on existing vegetation other than for the approved building envelope and services;

Comment - As outlined, clearing to facilitate the subdivision has been minimised to those areas for building envelopes, access, and other services. The design and location of these has been undertaken with primary concern for the protection of remnant vegetation.

(2) *subdivision being in a clustered form – unless based on existing dwellings, or in a format fitting the scenario diagrams 1 to 5;*

Comment – As discussed it is acknowledged that there is a preference for a clustered subdivision approach in the Strategy. This has been achieved to some degree in the proposed design with proposed lot 1 being of a smaller area (relatively) and located in a predominantly cleared area to ensure no clearing is proposed as part of building or access construction. It was not possible to cluster all lots or building envelopes in this cleared area given:

- iv) There are very limited areas to locate building envelopes given the low-lying and inundated nature of this area. The envelope on proposed Lot 1 is the only area not subject to such inundation in this sector of the lot apart from heavily vegetated areas which are predominantly within the Poorly Represented Yelverton (Yw) Vegetation Complex.
- v) The size of the property makes it difficult to configure a rational lot design around such a small, wet and cleared area particularly when there are other more suitable locations.
- vi) It would not be practical or realistic from a land management perspective to place the entire (or vast majority) of the remnant vegetation within one lot. Such a scenario would result in approximately 70ha of bushland being managed, maintained and enhanced by one landowner. It would clearly be more sustainable to share this responsibility to some degree between landowners, where the other principles of clustering can still be achieved.

The ability to provide a total cluster approach is further constrained by the existing dwelling on the lot. Notwithstanding this, the lot boundaries have been designed to align with existing firebreaks or tracks, limiting the possibility of any vegetation disturbance as part of any boundary demarcation (notwithstanding that only post and wire fencing is proposed). The envelope for proposed Lot 3 has also been located as close as possible to the proposed battleaxe leg to minimise clearing in this regard.

(3) *where possible building envelopes being located in a cleared area of the lot;*

Comment – As also discussed the building envelope for proposed lot 1 is in a cleared area, with that for proposed lot 2 existing. There are limited other cleared areas on the subject land with the only substantial area being in the northern corner of proposed lot 1. This area is inundated for much of the year and is generally not suitable for development. As such, an area that is presently partly used as a firebreak and that is relatively less dense than surrounding vegetation has been chosen as the building envelope location for proposed Lot 3.

(4) *in the case of a completely vegetated lot, building envelopes should be located in areas of poorer quality vegetation and outside the boundaries of poorly represented vegetation complexes;*

Comment – All proposed envelopes are outside the Poorly Represented Yelverton(Yw) vegetation complex (notwithstanding that the existing dwelling is located in proximity to this complex) and in areas of either cleared or poorer quality vegetation.

(5) *access ways being located along existing firebreaks or cleared areas.*

Comment – This has been achieved by utilising the existing track and firebreaks for all proposed building envelopes.

(6) *there being no additional fence lines created through remnant vegetation or wetlands areas, with lot boundaries in these circumstance being marked by bollards if necessary.*

Comment – Nearly all lot boundaries will utilise existing fencelines and firebreaks and where this is not the case (ie. A small are on the boundary between lot 2 and 3) bollards in addition to steel pickets will be utilised to ensure no impact on vegetation.

(7) *the minimum lot size for conservation lots being 3 hectares;*

Comment – The minimum lot size proposed is 9.38ha.

(8) *where possible, any agricultural lot created as part of the subdivision being of sufficient area for sustainable agricultural uses;*

Comment – This is not applicable as the only partly cleared lot is proposed to be rehabilitated.

(9) *there being a maximum of one building envelope created per lot;*

Comment – This is proposed in the Development Guide Plan.

(10) *the owner preparing a fire management plan for the lot that is consistent with the conservation values of the lot with this to be presented with the subdivision application for consideration (ie. this is to be provided up front rather than being required as a condition of subdivision approval).*

Comment – A Bush Fire Management Plan has been prepared for the proposed subdivision.

part preservation of a consolidated remnant will not be considered (ie proposals that involve protecting only a portion of a remnant, with the remainder being cleared or excised from the covenant and rezoning area will not be supported);

Comment – The total remnant is proposed to be protected by inclusion in the Bushland Protection zone and within a Restrictive Covenant.

(11) *the subdivision incentive applies to the lot in total and shall not be applied to individual remnants on one lot;*

Comment – The subdivision incentive has been applied to the land in total.

(12) *the subdivision incentive is available only to applicants with lots that meet the biodiversity value criteria at the time of application;*

Comment – The biodiversity values of the land have not changed since assessment by Shire officers.

(13) *lots that currently qualify for a subdivision incentive under the LNRSP are excluded from consideration of a subdivision under this strategy;*

(14) *lots located within the study area of the Busselton Wetlands Conservation Strategy are excluded from consideration of a subdivision incentive under this strategy;*

Comment – The subject land is within neither the LNR-SPP or Busselton Wetlands Conservation Strategy.

It is clear from the above that the subject land complies with the criteria for biodiversity within the Shires Strategy. Additionally the proposal has been formulated to ensure the conservation values of the land are retained and enhanced in the longer term. This is achieved both through a sensitive subdivision design and building envelope location and inclusion of the entire property in the 'Bushland Protection' zone and Restrictive Covenant.

5.2 STATUTORY CONSIDERATIONS

Shire of Busselton District Town Planning Scheme No.20

The Shire of Busselton District Town Planning Scheme No.20 (DTPSNo.20) was gazetted in September 1999. DTPSNo.20 zones the subject land 'Agriculture'. It is proposed to include the land within the 'Bushland protection' zone as part of Amendment No 57

which is presently with the WAPC for consideration for final approval. Amendment 57 is anticipated to be finalised prior to subdivision approval being granted for the subject-land.

The Policies and provisions of the new 'Bushland Protection' zone provide a strong and clear framework for the future land use and management of the subject land consistent with protection of its conservation values in perpetuity. Inclusion of the land in this zone will uphold the strategic direction set by the Shires Strategy and importantly supersede the present 'Agriculture' zoning which does not reflect the past, present or highest and best use of the land.

6.0 CONCLUSION

The proposed subdivision of Lot 12 Irvine Road, Metricup is justified on a range of planning and environmental grounds. Such justification, which is provided in detail throughout the preceding report, can be summarised to include:

- i) The land exhibits extremely high conservation and biodiversity values, containing over 70ha of remnant vegetation in good or very good condition in addition to 11.2ha of the 'Poorly Represented' Yelverton(Yw) vegetation complex. These values have been acknowledged in the Shire of Busselton Biodiversity Incentives Strategy which identified the subject land as satisfying the Biodiversity Value Criteria and can therefore be considered for a subdivision incentive.
- ii) The proposed subdivision reflects the adopted Development Guide Plan which proposes to establish 2 additional lots on the subject land has been designed to have only a negligible impact on the values of the land as a result of future subdivision and development. This has been achieved through careful siting of lot boundaries and building envelopes in areas that are either already wholly or partly cleared or of poorer value.
- iii) The property is being rezoned to 'Bushland Protection' zone as part of Amendment No.57 to DTPSNo.20, which combined with restrictive covenants to be placed on the subject lots, will ensure the protection of the subject land in perpetuity.
- iv) The Bush Fire Management Plan prepared in accordance and compliance with the WAPC 'Planning for Bush Fire Protection Policy' and Weed and Pest Management Plan prepared for the property ensure all facets of the future management and protection of the land are protected and maintained.

Subdivision approval is therefore requested to coincide with the granting of final approval of Amendment No.57 by the Minister for Planning.

ENTERED ON GIS

Name: Vegetation and Flora of Selected Areas at Lot 12 Irvine Road,
Metricup
Date: 11/05/2006
Capture Author: Thomas Leong

Comments:

Polygon

Created to match documented study area with high level of accuracy

Accuracy Levels:

- High = Document contained visual and or described spatial references easily copied, resulting in little or no polygon boundary errors
- Acceptable = Document contained visual and or described spatial references with complex boundaries, resulting in minor boundary errors
- Low = Document contained little or no visual and or described spatial references, resulting in polygon boundary errors

Attributes

Report Info – Captured without problems

Custodial/Contact – Captured without problems

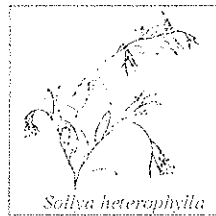
Content – Captured without problems

**VEGETATION AND FLORA
OF
SELECTED AREAS
AT
LOT 12 IRVINE ROAD, METRICUP**

within (Yd) + (Yw)
Whichever units

Prepared for:
Mr And Mrs Carter
RSM 468
BUSSELTON 6280

Prepared by:
Bennett Environmental Consulting Pty Ltd



Sollya heterophylla
PO Box 341
KALAMUNDA 6926

October 2004

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1. INTRODUCTION

Bennett Environmental Consulting Pty Ltd was contracted to undertake a search for Declared Rare and Priority Flora at areas intended to be cleared for building envelopes at the property in Irvine Road, Metricup, east of the Bussell Highway. It is proposed to divide the current property into 3 blocks, one of which already includes an established home. The remnant vegetation on all three blocks is to be conserved, under a covenant agreement with the Shire of Busselton. The only clearing is to be that associated with the building envelopes.

The site is part of the Drummond Botanical District of the Southwest Botanical Province. The Drummond Botanical District is contained within the geological boundary of the Perth Basin, mostly coinciding with the western boundary of the Darling Scarp (Beard, 1990). The soils are deep sandy flats and rises, mainly pale yellow in colour with swampy floors on the minor valleys. The valley floors vary from wet to semi-wet soils and sandy duplex gravels. (Department of Agriculture, 2003).

The vegetation is described by Beard (1981) as *Banksia attenuata* and *Banksia menziesii* Low Woodland. For the RFA project, Matiske and Havel (1998) described the pre-1750 distribution of vegetation complexes for the Busselton-Augusta area. The site is included in the Abba vegetation complex, which is described as a Woodland of *Corymbia calophylla* – *Agonis flexuosa* and tall shrubs of Myrtaceae – Proteaceae species on terraces and valley floors in the humid zone. The Department of Agriculture (2003) describe the vegetation as a Jarrah – Marri – Banksia Woodland on the sandy flats and rises and a Marri – Jarrah Forest and a Woodland with Paperbarks on the valley floors.

2. SURVEY METHODOLOGY

The vegetation units and condition was to be recorded for the building envelopes only, and no survey was undertaken of the surrounding remnant bushland. The field survey of these areas was undertaken on 25th September 2004. The position of the building envelopes had not been pegged but the owners of the block indicated in the field their location and the proposed access route for the building. The vegetation association present at each site and the species present were recorded.

Species were recorded in the field, but where the identity was unknown or uncertain these were collected and pressed, then later identified using keys and by comparison with the specimens housed at the Western Australian Herbarium. Current nomenclature was checked using FloraBase (Western Australian Herbarium, 2004a) and MAX (Western Australian Herbarium, 2004b).

2.1 Vegetation

The descriptions for the vegetation units present were prepared using the vegetation layers as listed in Table 1.

Table 1. Vegetation layers. Adapted from: Bush Forever (Department of Environmental Protection, 2000)

Life Form/ Height Class	Canopy Cover			
	100-70%	70-30%	30-10%	10-2%
Trees over 30m	Tall Closed Forest	Tall Open Forest	Tall Woodland	Tall Open Woodland
Trees 10-30m	Closed Forest	Open Forest	Woodland	Open Woodland
Trees under 10m	Low Closed Forest	Low Open Forest	Low Woodland	Low Open Woodland
Tree mallee	Closed Tree Mallee	Tree Mallee	Open Tree Mallee	Very Open Tree Mallee
Shrub mallee	Closed Shrub Mallee	Shrub Mallee	Open Shrub Mallee	Very Open Shrub Mallee
Shrubs over 2m	Closed Tall Scrub	Tall Open Scrub	Tall Shrubland	Tall Open Shrubland

Shrubs 1-2m	Closed Heath	Open Heath	Shrubland	Open Shrubland
Shrubs under 1m	Closed Low Heath	Open Low Heath	Low Shrubland	Low Open Shrubland
Grasses	Closed Grassland	Grassland	Open Grassland	Very Open Grassland
Sedges	Closed Sedgeland	Sedgeland	Open Sedgeland	Very Open Sedgeland
Herbs	Closed Herbland	Herbland	Open Herbland	Very Open Herbland

2.2 Vegetation Condition

The vegetation condition of each vegetation unit was recorded using the 6-scale condition rating as appeared in Bush Forever Vol 2, p. 48 (Government of Western Australia, 2000).

Table 2: Condition rating scale from Bush Forever (Department of Environmental Protection, 2000)

Rating	Description	Explanation
1	Pristine	Pristine or nearly so, no obvious signs of disturbance.
2	Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
3	Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure covers repeated fire, aggressive weeds, dieback, logging, grazing.
4	Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure covers frequent fires, aggressive weeds at high density, partial clearing, dieback and grazing.
5	Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure includes frequent fires, presence of very aggressive weeds, partial clearing, dieback and grazing.
6	Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas often described as "parkland cleared" with the flora comprising weed or crop species with isolated native trees or shrubs.

No search was undertaken of the Rare Flora database prior to undertaking the survey as a larger search, which included the current survey area, had been undertaken previously.

3. RESULTS

There were three building envelopes surveyed each 40m x 50m, 2000m² in size. On the development plan these were numbered and the same numbering is applied in this report. The block at the west is site 3, the one in the centre is site 2 and the one at the east is site 1. Site 2 is 4400m² and was already developed with a home and a buffer of planted species, including lawn around the perimeter, so is not considered in the following report. The requirement of the survey was that the building envelope site and a buffer of 30m around be surveyed for the remnant bushland. The whole block had been destocked for over 10 years.

3.1 Vegetation

A list of all species recorded from Site 1 and Site 3 during the survey is provided in Appendix A. No vegetation survey was undertaken at Site 2 as the building envelope is already developed.

Site 1. Open Shrubland of *Agonis parviceps* and *Agonis linearifolia* with emergent *Corymbia calophylla* over a Closed grassland/herbland, mostly weeds in loamy soil.



This is inferred to be Floristic Community Type 4 – *Melaleuca preissiana* damplands (Gibson *et.al.*, 1994). This Floristic Community Type is well reserved and its conservation status is low risk.

Site 3. Open Forest of *Banksia attenuata* and *Banksia ilicifolia* with scattered *Eucalyptus marginata* subsp. *marginata* over a Low Open Shrubland to an Open Low Heath of mixed species in grey sandy soil.



This is inferred to be Floristic Community Type 21b – Southern *Banksia attenuata* Woodlands (Gibson *et al.*, 1994). It is well reserved but its conservation status is susceptible. This Floristic Community Type occurs south of Bunbury on the Swan Coastal Plain.

3.2 Vegetation Condition

Site 1 was mainly Degraded to Completely Degraded (condition 5-6) with a small section classified as Good (Condition 4).

Site 3. The area varied between Good to Excellent (condition 2-4) as very few weeds were recorded. A firebreak ran through the area designated for the building envelope and there were sections that had been opened previously but were now regenerating naturally.

3.3 Species Present

Within the two small areas originally surveyed, a total number of 30 vascular plant families, 85 genera and 109 taxa (species, subspecies, varieties etc) were recorded from the site. The dominant plant families were: Myrtaceae and Orchidaceae with 14 taxa, Asteraceae with 8 taxa and Dasygogonaceae with 7 taxa.

3.4 Significant Species

Species of flora are defined as rare or priority conservation status where their populations are restricted geographically or threatened by local processes. The Department of Conservation and Land Management recognised these threats of extinction and consequently applied regulations towards population and species protection. Rare Flora are gazetted under subsection 2 of section 23F of the Wildlife Conservation Act (1950) and therefore it is an offence to “take” or damage rare flora without approval from the Minister for the Environment.

Table 3. Code and description of Rare and Priority Flora categories

Code	Code Declared Rare and Priority Flora Categories
R	DRF (Declared Rare Flora) -Extant Taxa. Taxa, which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection.
X	DRF (Declared Rare Flora) -Presumed Extinct Taxa. Taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently.
1	Priority One -Poorly Known Taxa. Taxa, which are known from one or a few (generally <5) populations, which are under threat.
2	Priority Two -Poorly Known Taxa. Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat.
3	Priority Three -Poorly Known Taxa. Taxa, which are known from several populations, at least some of which are not believed to be under immediate threat.
4	Priority Four -Rare Taxa. Taxa which are considered to have been adequately surveyed and which whilst being rare, are not currently threatened by any identifiable factors.

Table 4 presents the definitions of the threatened species Section 179 of the Environmental Protection and Diversity Conservation Act, 1999.

Table 4. Categories of Threatened Flora Species (Environmental Protection and Biodiversity Conservation Act, 1999)

Code	Code Declared Rare and Priority Flora Categories
Ex	<p style="text-align: center;">Extinct</p> <p>Taxa which at a particular time if, at that time, there is no reasonable doubt that the last member of this species has died.</p>
ExW	<p style="text-align: center;">Extinct in the Wild</p> <p>Taxa which is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.</p>
CE	<p style="text-align: center;">Critically Endangered</p> <p>Taxa which at any particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.</p>
E	<p style="text-align: center;">Endangered</p> <p>Taxa which is not critically endangered and it is facing a very high risk of extinction in the wild in the immediate or near future, as determined in accordance with the prescribed criteria.</p>
V	<p style="text-align: center;">Vulnerable</p> <p>Taxa which is not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.</p>
CD	<p style="text-align: center;">Conservation Dependent</p> <p>Taxa which at a particular time if, at that time, the species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.</p>

The following significant species were recorded from the site. One, was recorded from the remnant vegetated area at Site 1.

Site 1

Priority 2 Flora

Amperea micrantha is a low, spreading, bushy perennial, herb, 0.1–0.3 m high with insignificant brown flowers. It was recorded from the small stand of remnant bushland in the FESA clearing zone at the north of the site..

Site 3.

Declared Rare Flora

Drakea micrantha, one of the Hammer orchids is a tuberous, perennial, herb, 0.15–0.3 m high. The flowers are very small, red and yellow in colour. The single leaf at the base has prominent grey veining on the surface. The identity of this plant was confirmed by A. Brown an orchid specialist with the Department of Conservation and Land Management. This species is listed as Vulnerable under the EPBC Act. For any of these plants to be removed permission must be obtained from both relevant Commonwealth and State Departments.

Priority 2 Flora

Boronia capitata subsp. *gracilis* is a slender shrub, 0.3–0.6 m high with hairy branches and bright pink flowers. Only one plant was recorded in flower.

check the map!
check the spec if they are the correct form of species



Priority 3 Flora

Acacia semitrullata is a slender, erect, prickly shrub, 0.2–0.7 m high with cream or white globular wattle flowers. The leaves are elongated triangular in shape. Several plants were recorded.



Johnsonia inconspicua is a tufted perennial, grass-like herb, 0.1–0.3 m high spreading to 0.2 m wide. The flowers are green, white, pink and enclosed in pinkish coloured bracts. One plant was located in head, just prior to flowering.



Tufted plant



Pink inflorescence. The small flowers are enclosed within the pink bracts.

3.5 Weeds

A total of 11 weeds were recorded from the sites surveyed. Most were recorded from Site 1 which was degraded and where the soil was moist. All have all been determined as weeds by the Department of Conservation and Land Management (1999) and the Western Australian Herbarium (2004a,b) and their rating is given below in Table 5. The rating allocated to each weed by CALM is based on three criteria:

- **Invasiveness** – ability to invade natural bushland in good to excellent condition or ability to invade waterways.
- **Distribution** – wide current or potential distribution including consideration of known history of wide spread distribution elsewhere in the world.
- **Environmental impacts** – Ability to change the structure, composition and function of ecosystems. In particular an ability to form a monoculture in a vegetation unit.

Ratings indicate the following.

- **High** indicates this weed is prioritised for control and/or research ie prioritising funding to it.
- **Moderate** indicates control or research effort should be directed to it if funds are available, however it should be monitored (possibly a reasonably high level of monitoring).
- **Mild** indicates monitoring of the weed and control where appropriate.
- **Low** indicates that this species would require a low level of monitoring.

Table 5. Weeds recorded during the survey classified according to CALM (1999)

Scientific Name	CALM Rating		
	Rating	Invasiveness	Impacts
* <i>Romulea rosea</i>	High	✓	✓
* <i>Anthoxanthum odoratum</i>	Moderate	✓	
* <i>Arctotheca calendula</i>	Moderate	✓	
* <i>Disa bracteata</i>	Moderate	✓	
* <i>Ehrharta longiflora</i>	Moderate	✓	
* <i>Holcus lanatus</i>	Moderate	✓	
* <i>Hypochaeris glabra</i>	Moderate	✓	
* <i>Ursinia anthemoides</i>	Moderate	✓	
* <i>Vulpia bromoides</i>	Moderate	✓	
* <i>Acetosella vulgaris</i>	Low		
* <i>Lotus angustissimus</i>	Low		

4. ADDITIONAL SITE INSPECTION

When informed of the presence of the Declared Rare Flora, *Drakaea micrantha*, the owners who take a pride in the vegetation on their block, decided to move the building envelope. A brief inspection of the new site was undertaken on 24th October 2004 where the vegetation was observed to be more open with additional weedy areas. The vegetation of this new area was still that described for Site 3 but with many more *Allocasuarina fraseriana* trees. The vegetation condition was considered to be 4-5, good to degraded. Leaves of some *Drakaea* plants were observed but they had all shrivelled and were impossible to positively identify. Most appeared to be leaves of *Drakaea glyptodon* and the only plant observed with a shrivelled flower confirmed this.

Only one plant of *Drakaea micrantha* was observed when the original survey was undertaken but it is expected there would be additional plants within the vicinity. The location where the DRF was located is now about a hundred metres from the building envelope. No additional search was undertaken for the priority flora previously recorded.

5. DISCUSSION

One of the three blocks proposed with the subdivision of the site had a home established. This has a grassed area and non-native trees around the perimeter but does back onto natural bushland. As

sufficient area had been developed with the house construction this site was not surveyed. The western site, Site 3 had remnant vegetation present in good to degraded condition. The eastern site, Site 1 was predominantly cleared although several *Taxandria parviceps* and *Taxandria linearifolia* shrubs were regrowing. A small amount of remnant bushland was present on the northern edge near the wire fence and on the western edge. A priority 1 flora was located in the remnant bushland along the northern edge.

well known
priority 1

With the development of Site 3, the following will need to be considered.

1. As the vegetation is a *Banksia* Woodland the introduction of dieback (*Phytophthora cinnamomi*) would reduce the vegetation condition and its conservation value. Care would need to be taken to ensure that during development all vehicles entering the site are washed to remove all soil. Once at the site they should become 'site specific' until the development is completed.
2. Once the home is established a hard surface driveway with drainage away from the *Banksia* Woodland should be constructed. The hard surface should ensure that vehicles entering the site do not carry dieback into the area.
3. Collection of seed from the area to be developed should be undertaken prior to any development and this seed used to rehabilitate old tracks etc. As trees or shrubs are removed they can be coarsely chipped and the chips or branches laid over degraded areas. Seed should drop and seedlings should become established.

Good
idea

what about
"the
rehabilitate
30-40
shrub

Site 1 is mainly degraded. The building envelope backs onto a swamp, which is in very good to excellent condition. During construction and once inhabited, care will need to be taken to ensure that the water regime of the swamp is not affected.

All firebreaks were not driven but those observed were in excess of 5m width and well maintained.

There is a reasonable amount of remnant bushland present on each proposed block. It is very encouraging to see that the owners are very proud of their environment and have agreed to place a covenant on the remnant bushland, ensuring that with any development, the bushland will be conserved. Therefore the DRF, *Drakaea micrantha* and the three priority flora located during the original survey will continue to be protected. This covenant is also important as a tributary of the Carburnup Creek runs close to the northern side of the property.

W

5. ACKNOWLEDGEMENTS

Mr Andrew Brown is thanked for identifying the *Drakaea* species.
Mr John Bennett is thanked for assistance with field work and report checking.

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APPENDIX A

Taxa listed under survey areas

LEGEND

*	Weed
affin	Closest to the species
sp.	Species. Applied where the plant was not in flower or fruit
var.	Variety
subsp.	subspecies
Site 1	Open Shrubland of <i>Agonis parviceps</i> and <i>Agonis linearifolia</i> with emergent <i>Corymbia calophylla</i> over a Closed grassland/herbland, mostly weeds
Site 3	Open Forest of <i>Banksia attenuata</i> and <i>Banksia ilicifolia</i> with scattered <i>Eucalyptus marginata</i> subsp. <i>marginata</i> over a Low Open Shrubland to an Low Open Heath of mixed species

FAMILY	SCIENTIFIC NAME	COMMON NAME	SITE	
			1	3
ANARTHRIACEAE	<i>Anarthria gracilis</i>			+
ANTHERICACEAE	<i>Chamaescilla corymbosa</i>	Blue Squill		+
	<i>Johnsonia inconspicua</i>	Rush lily		+
	<i>Thysanotus patersonii</i>	Twining fringed lily		+
	<i>Thysanotus sparteus</i>	Fringed lily		+
	<i>Thysanotus thyrsoideus</i>	Fringed lily		+
APIACEAE	<i>Trachymene pilosa</i>	Native parsnip		+
	<i>Xanthosia huegelii</i>			+
ASTERACEAE	* <i>Arctotheca calendula</i>	Cape weed		+
	* <i>Hypochaeris glabra</i>	Flat weed	+	+
	<i>Millotia myosidifolia</i>			+
	<i>Podotheca angustifolia</i>	Sticky longheads		+
	<i>Quinetia urvillei</i>			+
	<i>Rhodanthe citrina</i>			+
	<i>Siloxerus filifolius</i>			+
	* <i>Ursinia anthemoides</i>	Ursinia		+
CASUARINACEAE	<i>Allocasuarina fraseriana</i>	Sheoak		+
CENTROLEPIDACEAE	<i>Aphelia cyperoides</i>		+	+
	<i>Centrolepis aristata</i>	Pointed centrolepis	+	+
	<i>Centrolepis drummondiana</i>			+
COLCHIDIACEAE	<i>Burchardia umbellata</i>	Milkmaids		+
CYPERACEAE	<i>Lepidosperma leptostachyum</i>		+	
	<i>Mesomelaena tetragona</i>	Semaphore sedge	+	
	<i>Schoenus curvifolius</i>			+
	<i>Schoenus laevigatus</i>			+
DASYPOGONACEAE	<i>Baxteria australis</i>		+	
	<i>Dasypogon bromeliifolius</i>	Pineapple bush		+
	<i>Dasypogon hookeri</i>	Pineapple bush	+	
	<i>Kingia australis</i>	Black gin	+	
	<i>Lomandra micrantha</i>	Small flowered mat rush		+
	<i>Lomandra nigricans</i>			+
	<i>Lomandra sonderi</i>			+
DENNSTAEDTIACEAE	<i>Pteridium esculentum</i>	Bracken fern	+	
DILLENACEAE	<i>Hibbertia hypericoides</i>	Buttercups		+
	<i>Hibbertia pulchra</i>	Guinea flower		+
	<i>Hibbertia racemosa</i>	Stalked guinea flower		+
DROSERACEAE	<i>Drosera erythrorhiza</i>	Red ink sundew	+	
	<i>Drosera glanduligera</i>	Pimpernel sundew		+
	<i>Drosera menziesii</i>	Pink rainbow		+
EPACRIDACEAE	<i>Leucopogon oxycedrus</i>	Beard heath		+
	<i>Leucopogon cordatus</i>	Beard heath		+
EUPHORBIACEAE	<i>Poranthera microphylla</i>	Small poranthera		+
HAEMODORACEAE	<i>Anigozanthos flavidus</i>	Tail kangaroo paw	+	
	<i>Conostylis setigera</i>	Bristly conostylis		+

FAMILY	SCIENTIFIC NAME	COMMON NAME	SITE	
			1	3
IRIDACEAE	<i>Patersonia umbrosa</i>	Flags		+
	* <i>Romulea rosea</i>	Guildford grass	+	
JUNCACEAE	<i>Juncus pallidus</i>	Pale rush	+	
LOBELIACEAE	<i>Lobelia rhombifolia</i>	Wrinkle seeded lobelia		+
LOGANIACEAE	<i>Phyllangium paradoxum</i>	Wiry miterwort		+
LORANTHACEAE	<i>Nuytsia floribunda</i>	Christmas tree		+
MIMOSACEAE	<i>Acacia divergens</i>		+	+
	<i>Acacia extensa</i>	Wiry wattle		+
	<i>Acacia pulchella</i>	Prickly moses	+	
	<i>Acacia semitrullata</i>			+
	<i>Acacia uliginosa</i>			+
MYRTACEAE	<i>Agonis flexuosa</i> subsp. <i>flexuosa</i>	Peppermint tree		+
	<i>Calytrix flavescens</i>	Summer starflower		+
	<i>Corymbia calophylla</i>	Marri	+	
	<i>Eucalyptus marginata</i> subsp. <i>marginata</i>	Jarra		+
	<i>Hypocalymma robustum</i>	Swan river myrtle		+
	<i>Kunzea micrantha</i> subsp. <i>micrantha</i>			+
	<i>Melaleuca thymoides</i>			+
	<i>Pericalymma ellipticum</i>	Swamp teatree		+
	<i>Taxandria linearifolia</i>	Swamp peppermint	+	
	<i>Taxandria parviceps</i>		+	+
	ORCHIDACEAE	<i>Caladenia flava</i>	Cowslip orchid	
<i>Caladenia</i> sp. Spider orchid		Spider orchid		+
<i>Cyanicula deformis</i>		Blue orchid		+
* <i>Disa bracteata</i>		South African orchid	+	
<i>Drakaea glyptodon</i>		King in his carriage		+
<i>Drakaea livida</i>		Warty hammer orchid		+
<i>Drakaea micrantha</i>		Dwarf hammer orchid		+
<i>Elythranthera brunonis</i>		Enamel orchid		+
<i>Microtis</i> sp.		Mignonette orchid		+
<i>Oligochaetochilus vittatus</i>		Greenhood		+
<i>Paracaleana nigrita</i>		Flying duck orchid		+
<i>Pterostylis recurva</i>		Jug orchid		+
<i>Pyrorchis nigricans</i>		Red beak orchid		+
<i>Thelymitra</i> sp.		Sun orchid		+
PAPILIONACEAE	<i>Gompholobium confertum</i>	Hairy yellow pea		+
	<i>Hovea pungens</i>	Needle leaved hovea		+
	<i>Isotropis cuneifolius</i>	Lamb poison		+
	<i>Jacksonia spinosa</i>			+
	* <i>Lotus angustissimus</i>	Slender birdsfoot trefoil	+	
	<i>Pultenaea reticulata</i>			+
POACEAE	<i>Amphipogon turbinatus</i>	Greybeard grass		+

FAMILY	SCIENTIFIC NAME	COMMON NAME	SITE	
			1	3
POACEAE	<i>*Anthoxanthum odoratum</i>	Sweet vernal grass		+
	<i>*Ehrharta longiflora</i>	Annual veldt grass		+
	<i>*Holcus lanatus</i>	Yorkshire fog	+	
	<i>*Vulpia myuros</i>	Rat's tail grass		+
PODOCARPACEAE	<i>Podocarpus drouynianus</i>	Wild plum		+
POLYGONACEAE	<i>*Acetosella vulgaris</i>	Sheep's sorrel	+	
PROTEACEAE	<i>Adenanthos meisneri</i>	Woolly bush		+
	<i>Banksia attenuata</i>	Narrow leaf banksia		+
	<i>Banksia ilicifolia</i>	Holly leaf banksia		+
	<i>Persoonia longifolia</i>	Snotty gobble		+
	<i>Petrophile linearis</i>	Pixie mops		+
	<i>Xylomelum occidentale</i>	Woody pear		+
RESTIONACEAE	<i>Hypolaena exsulca</i>	Rope bush	+	+
	<i>Loxocarya flexuosa</i>	Twine rush		+
	<i>Lyginia barbata</i>			+
	<i>Tetraria octandra</i>		+	
RUTACEAE	<i>Boronia capitata</i> subsp. <i>gracilis</i>	Cluster boronia		+
	<i>Philotheca spicata</i>	Pepper and salt		+
STYLIDIACEAE	<i>Levenhookia pusilla</i>	Midget style wort		+
	<i>Stylidium brunonianum</i>	Pink fountain trigger plant		+
	<i>Stylidium repens</i>	Matted trigger plant		+
	<i>Stylidium scandens</i>	Climbing trigger plant		+
XANTHORRHOEACEAE	<i>Xanthorrhoea brunonis</i>	Grasstree	+	+
	<i>Xanthorrhoea preissii</i>	Grasstree	+	