



9th September 2011

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Chairman
Environmental Protection Authority
Locked Bag 33
Cloisters Square WA 6850
Attention Gerard O'Brien

Dear Mr O'Brien

ROE HIGHWAY EXTENSION PER

Submission by Urban Bushland Council WA Inc
PO Box 326, West Perth WA 6872
Contact person: Mary Gray, Vice President
This submission is not confidential

SUMMARY

The Urban Bushland Council strongly opposes the construction of the Roe Highway extension as proposed in the PER because of the unacceptable impacts on critical assets as defined by the EPA as well as irreversible and unacceptable impacts on the conservation values of the area.

The scientific studies conducted for this proposal show that the impacts would be consistent with, AND even worse than, the EPA's stated concerns in Bulletin 1088 as quoted on p 357 of the PER. Considerable new information is now available from these and other studies after Bulletin 1088 was published, thus increasing the values of the Bibra Lake - North Lake area and heightening the risks to it.

Incursions by a highway into the complex and highly diverse wetland ecosystems of the Beeliar Regional Park, including EPP wetlands and CCW, are totally unacceptable and should be rejected as environmentally unacceptable. It is not possible to 'offset' such incursions and there would be an unacceptable net loss in environmental values and assets. This proposal is akin to the construction of a 6 lane highway through the middle of Kings Park, an icon of Perth.

The Urban Bushland Council expects that the EPA will independently and rigorously consider the significant environmental factors and their assessment without persuasion and undue influence by single minded political interests. We are well aware of the political motivation for this proposal and the bias and flawed processes used by the well funded South Metro Connect.

The purpose of the highway is purported to be for the removal of freight from South Street and Leach Highway (South Metro Connect). Looking to the future, as fuel becomes much more expensive (\$5-\$10/L), and to reduce Greenhouse gas emissions, freight will move to rail transport. Thus it is much more logical and economically sensible to upgrade the existing rail freight line (which passes to the south end of Bibra Lake in a much less sensitive environment) to Fremantle Port to attract freight to rail transport and away from road transport. It is well known that new

roads attract more traffic until they become congested and total Greenhouse gas emissions rise with the increase in traffic. We do not accept the suggestion in the PER that the highway will reduce Greenhouse Gas emissions. This is simply because the total volume of traffic will increase until the road capacity is reached and emissions will dramatically rise.

GENERAL COMMENTS

1. CHOICE OF BEST OPTION

- **The 7 options presented were not considered**

From the outset the choice of the best option for the placement of the highway was to be selected on scientifically based environmental grounds. It is both disturbing and totally unacceptable that the 7 options for the position of the highway were not all considered on environmental grounds in the first stage of the project as was initially intended. Option 7 was not even mentioned or assessed in the PER. Indeed the consultants (Syrinx Environmental and VCSRG) recommended that option 7 would have the least environmental impact on the wetland ecosystems and should be the preferred option (p83 Appendix D, final implication of the findings). Further they found that options 1, 2 & 3 (north of Hope Rd) would be contrary to Commonwealth and WA State policies for protection of wetlands, buffers, and protection of regionally significant vegetation. (Appendix D p134).

The UBC believes that failure to take this advice, exclude options 1, 2, & 3, and focus on the scientific examination of option 7 is a fatal flaw in the PER.

- **Workshop selection of options**

Pages 51 - 53 of the PER describe the process of choosing options. Four options are given on p 53 as the result of a workshop where no 4 (a bridge spanning the entire length of the wetlands) rated the highest (ie best option) in terms of environmental impact. This option was quickly dismissed on the grounds of cost and option 3 was regarded as the 'most sustainable option' in terms of environmental, social and economic criteria. This is a corruption of the term 'sustainable' as there is nothing sustainable in an option which destroys and disturbs a large area of a unique natural wetland ecosystem when there are better alternatives.

UBC representatives attended one of the workshops where participants were asked to choose the best option. Choices south of Bibra Lake, such as along the existing railway line, were not taken seriously and were ignored. This is unacceptable. Indeed suggestions from the community were in line with advice from the environmental consultants as above although they were unaware of this advice at the time.

Furthermore, at the workshop there was no information made available on the technical studies conducted for the proposal (eg on Acid Sulphate Soils, hydrology, stratigraphy, vegetation and flora, Black Cockatoo habitat, traffic studies). Participants were being asked to give their preference on limited options presented without being informed of baseline data. In other words these workshops were premature. Further, workshop facilitators modified input by participants-changed words and meaning and left out some key points made. There was no written feedback of workshop findings to participants - a fundamental failure. There was no response to complaints about these shortcomings. We found this both frustrating and unprofessional.

In summary then the process of choice of options was a farce and was not made on environmental grounds as AECOM had already decided on their preferred option. This is quite insulting to community participants and is frankly a corruption of proper community consultation processes where community volunteers offer their time and knowledge in good faith.

SPECIFIC COMMENTS

WETLANDS

1. As a general comment, the UBC is concerned that the extensive scientific information and advice in the report of 'Wetland Ecological Investigations' in Appendix D is inadequately or selectively used in the PER: some key findings or their consequences are omitted, the likely impacts are under-stated or omitted and conservation values are under-stated.

2. EPA objective

We emphasise that in assessing this PER, as stated on p 114 of Appendix D, wetlands and groundwater dependent ecosystems are *both priorities for protection at national and state levels and within the context of the globally unique Swan Coastal Plain. The EPA expects that there will be no irreversible changes to wetland values and functions over time resulting from this project.*

3. Bibra lake wetland system is unique

Appendix D pp 115-117 explains why *'the Bibra Lakes system, with its complexity, is the only representative of this type of wetland system developed along the interface between Bassendean Dunes and Spearwood Dunes on the whole Swan Coastal Plain'*. This value is not recognised in the PER.

We therefore draw to the attention of the EPA that the Bibra Lake - North Lake wetland system (including Roe Swamp, Murdoch Swamp etc) is unique and its conservation values should not be disturbed or changed.

4. Complex wetland ecosystem

Appendix D (p18--) describes how the North Lake - Bibra Lake area is the most structurally complex wetland system on the Swan Coastal Plain because of the complex stratigraphy in each of the three wetland zones. The three wetland zones are:

- the Delivery zone (on Bassendean Dune system) with groundwater flow generally from east to west but with some variability because the sands are not homogeneous causing perturbations to groundwater flow.
- the Impoundment zone (on Spearwood Dune system). This area is underlain by more complex stratigraphy of ridges, sheets, tongues and lenses of Tamala limestone with overlying and underlying sheets of differing quartz sand. These variable layers mean that groundwater flow is very complex and variable.
- the Wetland zone - where the water table is raised to form the chain of wetlands running ~north - south. The wetlands are underlain by a variety of sedimentary materials such as peat, clays, diatomite, and sand which retard and partly confine groundwater flow in complex patterns.

This is summarised on p 25 - 26. On p 27, the drilling program suggests that there are 2 west trending groundwater plumes: one northwest of North Lake, and the second west of south Bibra Lake. On the eastern side of the zone of delivery there is a northwest plume between Roe Swamp and North Lake and there are 2 local small mounds - one on Melaleuca Swamp and one between 4C and 4D on Hope Rd.

As a result the hydrology of the area is very complex with variable flow rates in both Bassendean Sand and the limestone and sand system of the Spearwood Dunes (p 66). *'Accordingly, application of a model to this system is unrealistic, and prediction of groundwater flows in terms of local directions and rates is not scientifically feasible.'*

In other words because of the complexity of the system and limited data from only part of a very dry year, the impact on groundwater hydrology of a major road with fill and compaction is unknown and cannot be confidently predicted. However the impacts will certainly not be homogeneous along the road length.

The value and implication of this complexity is not reflected in the PER on p 370 -372. Indeed the section 6.2.3.2 - 'Effects of Hydrology and hydrogeology on wetland function and values' does not appear to relate to the information in Appendix D and is contrary to it. There are no hydrographs shown in the PER. In Appendix D the hydrographs show variation in depths to water table for 6 months of the dry year of recording. These differences are misinterpreted and dismissed in the PER as not really being different. Wet years are likely to show even greater differences but this information is not available. It is not possible to make predictions unless the data from relatively wet years is available for this site.

Further the PER does not admit that perched water can be in a buried system - as exists in this area. The assertions in the PER (p371) that the road will have unimpeded impact on groundwater flows at or near the ground surface do not have any scientific basis from the information in Appendix D and no other source is quoted.

The UBC notes the high quality of studies and explanation of stratigraphy and hydrology in Appendix D by VCSRSG but that these studies are not well used in the PER and some important findings are omitted.

What the results mean for road construction is on p 82-83 of Appendix D. There are 12 implications listed and these are not adequately addressed in the PER. The last implication recommends that option 7 is the best option but this has been ignored in the PER. The UBC believes that this is a fundamental flaw in the PER.

5. Ecological functions

PER p 370: 6.2.3.2 and 6.3. These sections do not relate directly to the relevant information in Appendix D and it is very difficult to follow the PER as it is set out differently and is verbose with general information included from other sources which is not directly relevant

6. Groundwater Dependent Ecosystems (GDE)

Appendix D includes the report of an extensive and very impressive study of the groundwater dependent ecosystems in the project area. The UBC commends the quality and extent of vegetation survey and mapping for this project by Syrinx. A total of 23 broad GDE communities and 70 GDE sub-communities were identified (p92, section 11.2). Indicator species were identified for each sub-community. The vegetation map in Figure 40 shows the location and extent of each GDE sub-community. This is evidence of an extraordinarily diverse and highly complex wetland vegetation system. It reflects the highly complex stratigraphy and hydrology of the area. On p 103, it states that the native upland vegetation of the Bibra Lakes area is also rich and varied floristically and structurally. This detailed new information *adds extra dimension and significance* to the conservation values of the Bibra Lake - North Lake area.

We recommend that the EPA regards this exceptional wetland vegetation diversity - reflecting the highly complex and variable underlying stratigraphy and hydrology - as a critical asset to be protected. Therefore the area should not be subject to disturbance by construction of a highway with over 100 ha cleared as proposed.

Further, the detailed mapping of GDE communities *'will assist in impact assessment as each sub-community and the GDE indicator species will respond differently to altered hydrology depending on the complex stratigraphy with which it is associated.'* (Discussion p111 Appendix D)

The impact of changes in hydrology are discussed for some indicator species such as *Banksia ilicifolia* and *Baumea articulata*, as well as Marri and *B attenuata*.

7. Flora and Vegetation

The PER lists 7 EPA concerns relating to flora and vegetation on p 425.

All these concerns remain and cannot by definition be 'offset' as there will be a net reduction in environmental values due to irreversible impacts. Three of the concerns are

- *'Clearing of vegetation within the Roe Swamp complex would lead to significant impacts on the functions, values and fauna habitats of this wetland, as well as on the ecological linkages it currently maintains with North Lake and the wetland complex to the north; and*
- *Viability and long term management of the vegetation within the area will be reduced as a result of the area being further fragmented by the highway extension.*
- *The EPA considers protection of the dense wetland vegetation occurring in Roe Swamp in particular to be a high priority given its potential role in moderating chemistry of groundwater arriving from the east (EPA 2003)*

Since 2003, these matters have become even more important as clearing and loss of conservation areas and habitat has continued. For example, both the Bassendean Central & south complex (?under 5%) and the Karrakatta Central & South complex (~7.8%) are under-represented in Bush Forever. Therefore any further losses and disturbances in these complexes is unacceptable and contrary to government policy.

8. Wetland clearing and disturbance

The PER (pp 426-430) downplays and understates the extent and significance of clearing in a number of ways. It uses the term 'removal' rather than 'clearing'; it claims 54% of the vegetation in the project area is degraded or completely degraded and that there is no vegetation in excellent condition in the project area, - claims which are not supported by the data collected from the site as presented in Appendix D; it claims only 41.8ha of the 79.3ha cleared will be *'permanently'* cleared and that 37.5ha *'will be available for rehabilitation'*. The latter claim is nonsense as the total area of 79.3ha (if correct) is to be cleared of native vegetation. Notably the words *'will be available for rehabilitation'* do not give confidence that these areas will actually be replanted.

Further, the caption under Table 6.6-2 *'presents the area of each intact vegetation community impacted by clearing (not degraded variants) for the proposed project.'* Does this mean the area of vegetation in degraded condition is excluded from the figures for 'permanent and temporary clearing', thus understating the total area to be cleared?

Listing percentages of vegetation communities to be retained in the project area is irrelevant and appears to be an attempt to make the clearing impacts look insignificant. More disturbing is the column headed *'Approximate extent within permanent footprint'* for which the so-called temporary clearing areas have been subtracted, thus attempting to present a gross underestimate of the extent of clearing. This column is bogus and should be ignored.

Furthermore there is no key given for the unaccredited vegetation communities in Table 6.6-2 in the PER and they are not matched to or consistent with those in Table 13 p149 and Table 14 p 150-152 in Appendix D.

Information in the PER shows clearing of 79.3ha but this does not match information in Appendix D as follows:

Appendix D on p 146 -148 and in Table 13 gives data for direct clearing impacts and in Table 14 for indirect clearing impacts. .

Total GDE communities directly impacted = 11.71 ha

Total GDE communities distally impacted = 90.65 ha

For all the above reasons the extent of clearing presented in the PER is unreliable, should not be used, and should be independently corrected.

Clearing in an EPP wetland and in 7.39ha of a Conservation Category Wetland (CCW) are unacceptable impacts on critical assets and should not be permitted. It is also the indirect impacts on adjacent wetlands and GDE that are alarming as above. **This is recognised in the EPA Bulletin 1088.**

The PER lists offsets or mitigation measures for clearing (eg p 378 PER) but these will not counteract the net loss of good quality vegetation. The loss of at least 5.8ha + 5.4 buffer CCW at Roe, Melaleuca and Horse Swamps is a permanent unacceptable impact. Further the areas used for the buffers are not the same as those recommended in Appendix D so the impact is likely to be much larger than expressed in the PER for these sites.

Construction of bridges and culverts will still have an impact on the substrate and GDEs - and this is ignored in the PER p 379.

9. Road reservation history

The preferred option for this highway proposal cuts across the heart of the Bibra Lake - North Lake ecosystem simply because the old road reservation still exists there. This is a totally unacceptable rationale for modern planning.

The UBC strongly recommends that the road reservation be removed from its current location and that the area be added to the Beelii Regional Park and Bush Forever and be vested for the purpose of nature conservation.

10. Vegetation condition

The vegetation condition described in the PER is not inconsistent with condition rating in Appendix D by Syrinx. The PER gives poorer condition rates but does not reference these. This undermines the credibility of the data presented. It also divides clearing into permanent and temporary (as described above) which is nonsense. So-called temporary clearing is still clearing.

Figure 50 on p 128 of Appendix D maps areas of vegetation in good to excellent condition. It is remarkable that the preferred option for the highway cuts through this high quality vegetation for most of the Bibra Lake - North Lake section. Thus there would be a considerable net loss of high quality vegetation from direct construction impacts as well as associated impacts due to changed hydrological and hydrochemical (ie water quality) conditions. This constitutes an irreversible negative change to wetland vegetation values and functioning which is contrary to EPA requirements.

Thus the UBC submits that loss of a significant area of high quality vegetation in good to excellent condition, and inevitable changes and degradation to adjoining and hydrologically linked vegetation across the middle of the Bibra Lake - North Lake ecosystem constitutes a significant environmental impact and is environmentally unacceptable. We believe that this impact alone is a fatal flaw in the proposal.

11. Wetland boundaries and buffer requirements

Notably the studies on groundwater levels were done in 2010 in a very dry year. The consultants in Appendix D recommended that data for wet years from 1948 be used to predict hydrological impacts because there will be a return to wetter years in the climate cycles of ~20 and 250 years. Their studies predict that a highway constructed 'north of Hope Road, will potentially disrupt, intercept, and impede groundwater flows from the south east to the northwest.' This is based on the fact that the plant communities are different north and south of Hope Rd even though groundwater zones (16-17m) and topographic contours are continuous; ie the construction of Hope Rd has had the impact of changing the plant communities.

Hydrological effects are expected to extend 200m on either side of the proposed highway. (p129). Thus the consultants recommend a 200m buffer between any wetland and the edge of a new highway. For buried aquitards (eg buried wetland impoundments) and conduits, the buffer zone should be wider than 200m.

Figure 51 on p 129 maps the wetlands and buffer zones. Notably the wetlands and their buffer zones extend over the whole of the proposed highway construction footprint. The PER does not refer to or explain these buffers and uses the 'EPA minimum' of 50m without any reasoning. This is unacceptable and confuses the data for distal or indirect impacts on vegetation.

The map on p129 shows clearly that locating the Roe highway extension on the proposed alignment or on all of the options north of the southern edge of Bibra Lake will have irreversible impacts on wetland functioning and are therefore environmentally unacceptable. The UBC submits that this is a fatal flaw in the proposal.

12. Hydrological impacts

Appendix D p145 states that the proposed highway is in the direct path of groundwater flow between Roe Swamp and North Lake. **This will result in decreasing annual and seasonal flows to North Lake.**

The Highway will also disrupt and intersect the local groundwater flows between the sand hill west of site D and the wetland at site 3C. It will stop the reverse flow that seasonally occurs into the wetland, affecting groundwater dependant plants in dry seasons.

There is potential to change the wetland to the north of Roe Swamp from either dampland to sumpland or from dampland to dryland.

For the whole length of the highway, the overall impacts on the complex hydrology of the area is unknown but is likely to vary in dry compared with wet years. Impacts will be variable along the differing sections of the site because of the variable stratigraphy and groundwater flow patterns.

What is obvious is that there will be significant impacts on groundwater flows, impoundments and vegetation, that will be permanent and contrary to EPA objectives of 'no irreversible changes to wetland values and functions over time'

The UBC recommends that the OEPA and EPA be briefed by the consultants VCSRG and Syrinx to explain the complexity and implications of disturbing the Bibra- North Lakes system.

13. Composite risk maps of wetland values and functions (pp 134-137 Appendix D)

This analysis combines the above significant factors and shows that the area connecting Roe Swamp to North Lake has the highest Conservation Value with Bush Forever site, Aboriginal Heritage sites, regionally significant GDEs and CCWs all present. The proposed highway will have a direct impact on the high value area between Roe Swamp and Lower Swamp.

A major part of the construction footprint falls within the high risk areas.

Thus the maps show clearly that construction of the highway through this area will be contrary to EPA objectives, and government policies for protection of wetlands (including buffers) and regionally significant vegetation

14. Assessment of Environmental Impacts - general comment

The PER volume II is poorly set out with impacts broken into separate sections so that the overall impacts are difficult to determine. The information does not align well with Appendix D for wetland matters.

The PER p378 Table 6.2.3 under vegetation 'removal' does not show the total area cleared, but only 4.2ha + 0.4ha GDE in Roe Swamp and buffer AND 2.1 ha + 0.6ha Roe Swamp CCW and buffer. Do these areas overlap? What about the other areas to be cleared?

Clearing in the other swamps and uplands is listed separately or not at all - eg under road cuttings, fill and other earthworks.

As given in no 7 above, the *total* extent of clearing is not clear. The area of clearing in the PER is inconsistent with that in Appendix D.

15. Bush Forever PER pp 440-441

The PER states that 4ha of 'intact' vegetation will be cleared in Bush Forever site 244. It does not state how much so-called degraded or other vegetation in site 244 will be cleared. On p 441 the PER attempts to justify this clearing by stating that 24% of Bassendean Central & South complex 'currently' remains (but does not say at what date) and that implementation of the project will reduce this area by 36ha or 0.3%.

How much of this clearing is actually in Bush Forever site 244?

The extent of Bassendean Central & South remaining is irrelevant here. It is the minimum of 10% of each vegetation complex *secured and retained in Bush Forever* which is the relevant target of SPP 2.8. Indeed this target has not been reached for securing this complex in Bush Forever.

Furthermore the target for retention of each vegetation complex in the PMR is actually at least 30% according to Perth Biodiversity project planning guidelines for local government. So the clearing of any more Bassendean Central & South complex is actually contrary to government policy and targets.

The PER does not discuss the clearing of Karrakatta Central & South in Bush Forever site 244, an EPA concern p 425 of PER.

This misleading and erroneous justification for seeking approval of clearing in a Bush Forever site must be rejected by the EPA. Bush Forever sites are critical assets to be retained in perpetuity.

16. Acid Sulfate Soils (ASS, PASS) Appendix F, PER Vol 1 p121-126, Vol IIp 417-423

Acid sulfate soils (both ASS and PASS) exist in the path of the preferred option and all options 1-4. Eight out of nine samples tested had ASS or PASS (p125). Some sections were not tested because of restrictions on permission to disturb soils.

The WAPC/DEC guidelines state that development should *avoid* potential adverse effects on the natural environment. The only way to *avoid impacts* where ASS and PASS are present is to leave such areas *totally undisturbed*. There must not be any dewatering or excavation of such soils.

Therefore placement of a highway across ASS sites should be avoided. From the ASS risk map in Figure 5.5-1 p122 PER, it is obvious that the whole area between North Lake and Bibra Lake is not suitable for a highway construction. Bridges, culverts, excavations all constitute disturbance which would result in adverse impacts.

We remind the EPA that 'mitigation' measures are no substitute for *avoidance* and that the principles of prevention and the precautionary principle should apply to this proposal in terms of avoiding irreversible impacts from disturbance of ASS and PASS sites. The shocking legacy of the

resulting contamination of the area around the mouth of the Murray River, the Rosalie Estate Karrinyup, canal developments in the Peel estuary, and dewatering for the railways station at Gwelup are some examples of irreversible damage to the natural environment from disturbance of ASS. Biotic impacts (to aquatic invertebrates, insects, flora and vegetation) occur when pH drops to 4.2 and below (Pierre Horwitz pers comm 2005). Some plant species are likely to react to lesser changes in soil or groundwater pH. When will the Government learn that these high risk sites are to be avoided?

The Urban Bushland Council recommends strongly that formal advice be obtained from senior Hydrologists in DEC concerning the risks of acidity and environmental degradation, interpretation of the data obtained in Appendix F and the need to avoid disturbance of such areas.

The data presented on p 121 - 126 of the PER condemns the proposal. Notably the suggested mitigation measures on p 421-423 are not adequate. The PER admits that the proposed realignment of Murdoch Swamp including excavation will disturb PASS (p418) and this is totally unacceptable. The discussion of construction impacts on p 418-419 confuses risks associated with contaminated sites from former landfill operations with the inherent risks of disturbing naturally occurring ASS and PASS. The latter risks remain.

We submit that the risk of disturbance of ASS is a fatal flaw in the proposal for the Roe Highway to transverse the North lake Bibra Lake area and that any such proposal is environmentally unacceptable and should be rejected.

VERTEBRATES

1. Black Cockatoo

The Public Environmental Review proposes management and mitigation measures for significant impacts on threatened species. Any mitigation measures proposed will not compensate for loss of feeding habitat for black cockatoos. Any clearing now of vegetation and habitat for black cockatoo is a net loss and is completely unacceptable, if the government is serious about having black cockatoos survive. It must be remembered that the Swan Coastal Plain and especially the Perth region is the habitat of our iconic Carnaby's Cockatoo.

New information: The federal government and DEC are both extremely concerned about the declining numbers of Carnaby's Cockatoo. The Great Cocky Count of 7 April 2011 recorded counts of cockatoos down by an average of 50% (Environment and Conservation News 26 April 2011) and each of the roosting sites had diminished numbers. This is a classic sign that the population is in decline. Community conservation groups are also very concerned about declining populations and cumulative loss of habitat.

This trend was confirmed when results of the 5 June 2011 Great Cocky Count were analysed. Dramatic changes also in Forest Red-tailed Black Cockatoo populations and behaviour have also been observed this year in the Wungong catchment studies by Ron Johnstone and Tony Kirkby (WA Museum).

Advice from the Black Cockatoo Rehabilitation Centre is that black cockatoos being picked up injured or unable to fly, weigh 20% less than they did in years previous to 2011. Cockatoos are not able to find enough food to eat.

Despite all the evidence that black cockatoos are declining in numbers and that they may not survive into the future, and that their distribution is changing, the state government is still putting up projects which include clearing of essential habitat when less damaging alternatives could be pursued. This proposal, the subject of the PER is one of them. We recommend that the EPA rejects

the proposal to clear Cockatoo habitat in this proposal, especially when the preferred option no 7 or upgrading of the existing railway line could have been proposed as the preferred option without any loss of Cockatoo habitat and other high value fauna.

The UBC brings to your attention the shortcomings of WA's outdated Wildlife Conservation Act and the fact that there is no legal protection in WA of habitat for the 3 species of endangered Black Cockatoos. Furthermore there is new information available only this year about populations of these Cockatoos. We therefore recommend that the EPA be briefed about population studies in the Great Cocky Count (Geoff Barrett DEC Swan Region in conjunction with Zander of BAWA), and in the Wungong catchment trial (Ron Johnstone WA Museum) before consideration of this PER.

2. Southern Brown Bandicoot.

Clearing for the Fiona Stanley Hospital saw 61 Southern Brown Bandicoots relocated to Julimar Conservation Park and to Beeliar Regional Park. Southern Brown Bandicoots have been successful at surviving but as the example of the Fiona Stanley Hospital site shows, clearing their habitat means they have to be relocated, and areas to which they are released, possibly have a full compliment of Bandicoots.

'Animals need food through all the four seasons and enough space in which to find it, shelter from the elements and predators, especially foxes and cats, the chance of meeting a mate and the chance to disperse safely to new or vacant territories when the area in which they are born is 'full up', or becomes less suitable after an event such as a fire' ('Wildlife Notes' Department of Conservation and Land Management, May 2004).

The construction of the Roe Highway extension would make the needs of this mammal, which is a priority species for DEC, harder to be met. In Appendix M it is stated;

'However, native fauna of the Swan Coastal Plain have been subjected to significant, progressive pressures from urbanisation and habitat fragmentation which has led to significant population declines for many species'.

The PER states that at least 107 individual Bandicoots are in the area, with a population density of 28 per hectare. Compared with the population density recorded at Piney Lakes of 1.5 individuals per hectare, this is a substantial number of Bandicoots per hectare and perhaps a questionable figure.

On the topic of relocation, we read from the Department of Health, www.fionastanley.health.wa.gov.au that *'More than 4,500 reptiles and amphibians such as frogs, snakes and lizards have been successfully relocated to Beeliar Regional Park since 2008'.* **And the survival rate is ????? Relocation is not a suitable offset or compromise for retaining habitat.**

3. Other birds

Beeliar Wetlands cater for international migratory birds which are protected under the JAMBA, CAMBA, ROKAMBA International Government Agreements'. Four migratory bird species of State and/or Commonwealth significance were recorded; the Eastern Osprey, Eastern Great Egret, Glossy Ibis and Rainbow Bee-eater.

The PER does not mention bird species considered 'at risk' by Davis and Brooker.

These species are Carnaby's Cockatoo, Australasian Bittern, Blue-billed Duck, Splendid Fairy-wren, White-browed Scrubwren, Yellow-rumped Thornbill, Western Thornbill, Inland Thornbill,

Tawny-crowned Honeyeater, White-cheeked Honeyeater, Scarlet Robin, Varied Sittella, Golden Whistler, Grey Shrike-thrush. (Appendix M pages 48/49)

4. Appendix T: Effect of traffic noise on birds

Phoenix Environmental Sciences, in Appendix T *Effect of traffic noise on birds*, recommends that a precautionary approach is warranted as limited data is available specifically for wetland birds.

It is clear that all the above bird populations will all suffer decline from loss of wetland and GDE habitat with this highway proposal will be an irreversible impact. Therefore it does not meet EPA objectives and should be rejected.

5. Short range Endemic and Invertebrate Fauna Survey

Appendix P: Invertebrate survey for SouthmetroConnect

The Urban Bushland Council WA congratulates Phoenix Environmental Sciences Pty Ltd for the work done on this survey targeting short-range endemic and Targeted Invertebrate Baseline Surveys for the Roe Highway Extension Project. We are not aware of any other development proposal which includes such an extensive and thorough invertebrate survey. Phoenix's surveys were conducted at appropriate times when target species were likely to be present, and known plant associations were considered.

Seven short-range endemic species of conservation significance were recorded in the study area, (as well as eight SREs not considered to be of conservation significance). There were three species of spiders and four species of millipedes found during the Phoenix surveys.

- **Spiders**

The PER has the spider *Tinytrema yarra* (Flattened Ground Spider) in the Table 5.9-10 but does not include the following recorded in Appendix P:

The spider, *Tinytrema yarra*, is '*very rare, in addition to the male for this survey....currently only known from a single female on the Darling Escarpment approximately 60kms east of survey area*'. In addition the PER does not include the comments below:

- **Trapdoor Spiders**

Mygalomorph fauna in Western Australia *remain taxonomically poorly known for many families and genera*.

- **Mouse Spiders**

Missulena granulosa occurs infrequently on the Swan Coastal Plain and was collected in only one site in the Phoenix survey.

- **Sucking millipedes**

Of one species of sucking millipede collected by Phoenix, it states; '*very likely the specimens from this survey represent PMA SREs*.'

This invertebrate fauna is rarely seen and bushlands are being cleared without finding out what invertebrates are present and the job they do in the ecosystems.

6. Graceful Sun-moth, *Synemon gratiosa*

Habitat for the Graceful Sun-moth is being destroyed or threatened on the Swan Coastal Plain. (Examples are Underwood Avenue Bushland, bushland adjacent to Shenton Bushland for Radiation Clinic, bushland in Bedbrook Place for a Clinipath Laboratory). Six individual Graceful Sun-moths were seen over the surveyed area.

The Federal Department of Sustainability, Environment, Water, Population and Communities state that '*the population trend of the Graceful Sun-moth has probably declined in recent years. This can be concluded due to the inability of surveys to find specimens at historical locations. However, the*

rate and magnitude of past population decline is unknown and difficult to estimate. The Department also states that the 'Graceful Sun-moth is associated with two habitat types; coastal heathland and Banksia woodland on Spearwood and Bassendean dunes'. and 'The remaining remnant habitat is severely fragmented, with most subpopulations disjunct and separated by urban and agricultural areas that limit or prevent dispersal (WA DEC 2011).

The proposed highway will further threaten these critically endangered sun-moths and clearing and disturbance of their habitat should not be approved. At the State level it is only the EPA that can recommend that these endangered species be protected by rejection of this proposal.

CONCLUSION

Various studies given in the Appendices for the project have contributed much more baseline information about the environmental values of the area, enhancing the overall understanding and documented values of the area. This raises the conservation value of the unique Bibra - North Lake chain of wetlands and their surrounding groundwater dependent ecosystems - which cover the whole area.

The data in the appendices show that Hope Road has already had an impact on the area, and a much bigger road structure will have a greater direct and indirect set of irreversible impacts. Fatal flaws or unacceptably high risks include the presence of acid sulfate soils, the risk of changes to complex but sensitive stratigraphy and hydrogeology, the potential damage and changes to extraordinary richness in groundwater dependent ecosystem vegetation communities and sub-communities, the threat to rich fauna assemblages - both invertebrate and vertebrate, threats from clearing and habitat disturbance for nationally and internationally listed bird species.

The Urban Bushland Council recommends that the proposal be declared environmentally unacceptable and that the road reserve be added to Beeliar Regional Park and vested and actively managed for the purpose of nature conservation.