



# STEP Matters

Number 154, April 2010

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## In this issue

Our second issue for the year has a distinct planning flavour, with the lack of excellence in long-term planning being a consistent theme.

- Our Key Issues section provides an overview of progress being made in a number of significant local matters.
- We advise members that *Barry O'Farrell* will be addressing the STEP AGM on the important issue of population growth.
- The proposed SAN development has finally received Ministerial approval. A win for the environment but an ever worsening black spot for traffic.
- NSW National Parks are in danger of being loved to death. Can they still deliver on their conservation objectives?
- Should Sydney continue to accommodate the majority of population in NSW? *Andrew Little* sets out the STEP view on the current Metropolitan Strategy Review by the Department of Planning.
- Fixing Pennant Hills Road; there is no easy or cheap solution. John Burke restates STEP's support for a tunnel as a part of a new approach to the problem.
- What is volcanic diatreme vegetation? *John Martyn* describes it and why Dog Pound Creek in Hornsby has some of the best preserved diatreme vegetation in the Sydney region.
- The electricity ladder. *Paul Burke* examines the national-level electricity ladder that countries climb as their economies develop and explains the need for an ETS in Australia.
- Old Mans Valley in Hornsby has a long and colourful history. *Ted Angelo* has made a point of recording it for us all.
- Large? Cute? Scary? *Robin Buchanan* looks at the bright side of bandicoots, brush turkeys and swamp wallabies.
- The Sydney transport system needs fixing. Everyone knows the problem but *Jim Wells* understands the answers better than most.

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## STEP Talk – Speaker Prof Peter Steinberg – 1 June 2010

8.00pm – St. Andrews Church Hall, corner Chisholm and Vernon Streets, Turramurra.

**Topic: “SIMS, Sydney Harbour and the East Australian Current”**

Peter Steinberg is Professor of Biology and Joint Director of the Centre for Marine Bio-Innovation at The University of New South Wales, and inaugural Director and CEO of the Sydney Institute for Marine Science (SIMS) at Chowder Bay on Sydney Harbour. He has approximately 120 publications in international refereed journals in a diversity of biological and chemical fields and is an inventor on 8 patents. He has been a Fulbright Scholar, a Queen Elizabeth II Fellow and CEO of an ASX listed biotechnology company focusing on the development of novel antibacterials from marine organisms. He is a former Associate Editor of the journal *Biofouling* and is on the Editorial Boards of *Ecology and Marine Ecology Progress Series*.

His research interests include seaweed ecology, diseases of marine organisms, biofouling and antifouling, bacterial biofilm biology and ecology, and marine chemical ecology.



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## Key Issues – Announcements and Updates

### Population Growth in Australia – Barry O’Farrell to address STEP

Is further population growth desirable in Australia? STEP has been asking this simple question for the past twenty years, but for most of that time our policy makers have studiously avoided addressing the issue. Instead, they have clung to absurd notions such as believing that we can, as a society, lessen our impact on the environment while at the same time degrading or destroying it to make way for more of us.

Lee Rhiannon, NSW Greens MLC, was our guest speaker at the October 2009 STEP AGM. She used that occasion to be one of the first high profile politicians to talk in public on this issue. STEP is pleased that there has recently begun to emerge a far broader community debate on population levels, both current and prospective. For the first time leaders of our main political parties are being called upon to address this issue.

We are therefore delighted to announce that STEP member Barry O’Farrell, Leader of the Opposition in New South Wales, has accepted our invitation to address the next STEP AGM on 12 October 2010 on the topic *“The Politics of Population in Australia and its impact on meaningful Climate Change Action”*.

Keep the date free!

### St Ives Showground and Precinct Lands Options

Ku-ring-gai Council (KMC) placed a draft options paper for this area on public exhibition earlier this year. STEP responded to KMC with a submission supportive of the overall plans for the precinct, particularly:

- The stated intention to protect in perpetuity the Duffy’s Forest Ecological Community
- The removal of Mini Wheels from its present site. It is clear that it is quite inappropriate to have such an operation located in such an environmentally sensitive site.
- The proposal to retain the Wildflower Garden in its current location and to relocate the Nursery to the new site.

STEP is however strongly against the proposal to construct a six metre wide sealed cycling track along the external [fire trail] perimeter of the Duffy’s Forest Ecological community and the Ku-ring-gai Chase National Park. Sealed tracks are the cause of both short and long term environmental damage and the chosen location could not be more environmentally fragile. STEP suggests that the preferred route for the sealed cycleway should be the proposed track that runs between Duffy’s Forest and the Princess Anne Field and then the Jim Watson Arena. This will allow for an extended cycleway while still protecting the heartland of the Duffy’s Forest community.

KMC has now announced that it is calling for expressions of interest to develop recreation facilities over the whole of the St Ives Showground and Precinct Lands site. These may include an

education and cultural centre, an indoor sports centre and two full sized synthetic playing fields.

While these are still only draft options, STEP repeats its call for an independent environmental report to assess the overall cumulative impact of the proposals, both for facilities and for parking and traffic arrangements. Bushland becomes degraded over time due not only to loss of habitat and boundary encroachment, but also due the impact of inappropriate [and some times inadvertent] stormwater and soil nutrient enrichment activities. Internal mechanisms to monitor these impacts are often ineffective.

### Mountain Bikes – part of a wider problem?

Jane Judd, Chair NSW National Parks and Wildlife Advisory Council, wrote an article for the last issue of STEP Matters entitled *“Mountain Biking: Balancing Conservation and Recreation Objectives”*. This article has resulted in a number of responses from those for and against the development of special trails for mountain bikes inside National Parks. STEP Matters does not have sufficient space to carry all of those responses, but we will be endeavouring to list the main ones on our web site as soon as we are able to do so. STEP has now also established a sub committee to consider our policy on this issue. STEP is anxious to foster a proper public debate on this matter, as we can, reluctantly, see some merit in having purpose built trails going through appropriate areas of both National Parks and other areas of bushland. We can however see no merit in any such trails, whether legal or illegal, being allowed in areas of high quality core bushland, or in those areas in which they impose a high environmental impact. Nature protection and conservation must come first. This debate is of course part of a far wider debate concerning the future of our National Parks, and concerns whether they are in fact in danger of no longer being able to fulfil their primary objectives of effectively protecting our native fauna and flora. See the article on page 4.

### Old Mans Valley Hornsby

Old Mans Valley is an area of approximately 11 ha adjacent to the infamous Hornsby Quarry. Much of the area is either steeply inclined or is now disturbed land resulting from previous filling activities, although there are still some patches of good intact bushland. Hornsby Council are in the middle of a public planning process, to which some STEP members have contributed, as to how best to use the land for recreation and leisure purposes. These plans are likely to include the development of sports fields, walking tracks and cycle trails. The area has a rich Koori history and the surrounding area contains many rock engravings. In 1836 Thomas Higgins, son of two Second Fleet convicts, received the land as grant from Governor Brisbane and became the European settler to the Hornsby area. Ted Angelo is a descendant of the Higgins family and has tried to record and preserve much of the history of the site. Read one of his stories on page 10.

## Hornsby's Housing Strategy for Thornleigh - planning for a failed community?

The last issue of STEP Matters carried an article by Gwen Martin, a local Thornleigh resident and spokesperson for the Thornleigh Normanhurst Residents Group (TNRG). The article highlighted the abysmal level of planning (or lack of it) over the past twenty years for the Thornleigh area by Hornsby Council. Ku-ring-gai residents will well be able to sympathise with Thornleigh locals, who face the prospect of having both five and ten storey medium density dwellings being erected on either side of Pennant Hills Road to appease State Government demands for additional dwellings in Hornsby Shire.

STEP undertook to forward Gwen's article to the three local Ward C Hornsby Councillors for their response. All three Councillors have met with Gwen and fellow residents, listened to their concerns and asked for more information. The result has been a well prepared submission from TNRG, now with Hornsby Council, and a petition signed by over 1200 local residents. What is really interesting however, is the fact that the residents are *not* asking for the medium density housing plans to be dumped on some other community, but are instead asking for Council to join with them in working to deliver a long term plan that will contain the building blocks needed for a vibrant and healthy community into the future. What has happened to good old Aussie NIMBYism? You too can read their ground breaking submission at <http://tenistoohigh4thornleigh.webs.com/>

## Lane Cove National Park (LCNP) - Plan of Management

Lane Cove is now the fifth most visited National Park in NSW, used by nearly 1 million people every year. It is also surrounded by over 2000 residences along its immediate boundaries. This level of human interaction poses special problems as far the conservation of native fauna and flora is concerned

Each National Park must have a Plan of Management (PoM) and these plans have to be updated at regular intervals. These plans are prepared in accordance with the National Parks and Wildlife Act, and once approved, become the legally enforceable policies for the management of LCNP. The last PoM for LCNP was completed in 1998, since when the Park has nearly doubled in size to about 700 hectares, mainly due to the Pennant Hills Park and Thornleigh Park additions.

National Parks have advised that the current revision to the Lane Cove PoM, to which STEP has contributed, has been delayed but is expected to be finalised before the end of this year.

### Talk by Janine Kitson

STEP members who were unable to attend the recent fascinating talk by Janine Kitson on the significance of the Wurrumbirra Sanctuary to the environmental movement, will be able to find a copy of her talk on our new web site (currently still under construction).

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## A win for the environment but expect traffic chaos: the SAN Wahroonga Estate Redevelopment

STEP members might have read the excited announcement in the local media of the approval of the Wahroonga Estate Concept Plan by the NSW Minister of Planning on 31 March 2010. This approval brings to an end a saga that commenced in early 2007 with an initial submission from the developers that would have seen 2000 new residential dwellings, along with expanded schooling, nursing quarters, commercial and retail developments. It would also have meant a massive loss of bushland and many thousands of additional vehicle movements per day, dumped into an area already suffering from chronic peak time traffic congestion. Oh, and the hospital facilities would be expanded too.

While STEP never had any problem with the hospital expansion plans, we did object to the significant over development that the entire project represented for this particular site. Our concerns intensified when the developer, the Johnson Property Group (JPG), a major donor to State Labor, had the Minister call the project in under Part 3A of the Environmental Planning and Assessment Act in December 2007. This effectively removed the development from the decision making of the local community, but of course did nothing to remove the consequences of those decisions from having to be borne into the future by the local community.

STEP was appointed to the Community Reference Group (CRG) which was set up in March 2008 to

provide at least the appearance of community consultation on the SAN proposal. The CRG met five times during the course of the planning stage. STEP and other members of the CRG worked hard to highlight and identify both the environmental and infrastructural impacts and shortcomings of the various proposals presented by JPG. This resulted in the matter being referred by the Department of Planning (DoP) to the Commonwealth Department of the Environment as a "controlled action" in relation to certain critically endangered ecological communities which we believed was to be found on site.

STEP's own detailed fact based submission to the DoP, which can be found on the home page of our web site at [www.step.org.au](http://www.step.org.au), was strongly supported by the NSW Nature Conservation Council and the National Parks Association. It was also strengthened by an excellent submission from Ku-ring-gai Council. Both submissions challenged many of the inaccurate representations made by the developer in their Concept Plan. The developers were also criticised by the NSW Department of Environment and Climate Change regarding the proposed new school, which was, they said, "poorly sited and planned". The plans also attracted 160 local individual submissions from the public, of which over 96% were against the development proceeding.

In the end, these submissions resulted in a number of important changes. The number of new additional private residential dwellings was reduced down to 500, certain proposed road links were removed, the proposed school hall and oval were relocated and a lower scale of housing was decided for Mount Pleasant Avenue. Even more importantly, the proposal's development footprint was scaled back and the amount of conservation land was increased from 18ha to more than 30ha.

Half of the entire site is to be quarantined from development due to its "significant environmental value" and the presence of endangered ecological communities such as the Sydney Turpentine Ironbark and Blue Gum High Forest. Importantly, this includes the removal of the planned residential development on the east side of Fox Valley Road, a decision for which STEP had strongly argued. This area has one of the finest examples of vegetation transition from shale to sandstone in the northern region of Sydney. The adjoining freeway corridor land to the north-east has a further 2 ha of Blue Gum High Forest/Turpentine-Ironbark Forest, while the lower riparian corridor links to the rare diatreme rainforest vegetation at Browns Field. This is indeed an environmental crown jewel worthy of special protection. STEP therefore commends both the developer and the SAN for their consideration of the environmental issues involved.

On the other hand, the overall size and scale of the rest of the WER proposal did not much alter. The height limit for some buildings was increased to six

stories and the retail and commercial expansion plans essentially remained as proposed. As the Planning Minister himself said when approving the project, it will become a whole new "mini suburb within a suburb". Unfortunately, the traffic infrastructure to support the new suburb remains a significant problem area and one without an apparent solution. With only some minor amendments to the original plan, the RTA and the developer now believe that the road system is adequate for the proposed development once some upgrades have been completed. It is clear that they have simply not addressed the issues raised in the very detailed traffic report submitted by STEP, supported by an independent local traffic consultant. Indeed, the RTA sign-off for the development plan specifically excluded the need to upgrade the Pennant Hills Road/Comenarra Parkway intersection, which had previously been included by the developers own traffic experts as needing upgrading! It seems that the RTA still has much to learn about planning, as perhaps is evident from the recent F3 fiasco.

So, in the end, a mixed result. Some long term health wins for the SAN, along with long term traffic problems for the community. The pity is that it did not have to be so.

**Note:** The Director General's Assessment Report and Concept Plan Approval can be downloaded under the heading, 'Attachments and Resources:' from the folder 'Public Files' and then 'Determination' at: [http://majorprojects.planning.nsw.gov.au/index.pl?action=view\\_job&job\\_id=1207](http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=1207)

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## Conservation or Desecration? Our National Parks future in the balance

The unique geographical character of Sydney is defined as much by its national parks as it is by its harbour. Established with great foresight over a century ago, the quantity of pristine bushland so close to the city is a source of amazement to visitors and of much quiet enjoyment to countless locals. More importantly, the bushland remains as a reasonably secure place of refuge and a safe habitat for much of our remaining local fauna and flora, both endangered and otherwise.

Unfortunately less than 7% of New South Wales carries national park protection status. The balance of the land lacks effective environmental protection and is pretty much open for organised commercial and recreational groups to do with as they like. This includes the more than 2 million hectares of NSW State Forest which the State Government as recently as 2002 opened up to the delights of recreational hunting. The overall result of this level of official and unofficial indifference is both predictable and terrible; last year the CSIRO reported that New South Wales and Australia has the worst mammal extinction record in the world. It has a pretty dismal record in other areas of conservation as well.

Both the State Government and many commercial, sporting and recreational communities seem to have decided that NSW national parks are open-slaughter for people who feel the need for access to open spaces to pursue their particular objectives. The commercial tourism industry in particular sees these parks as a means of increasing visitor numbers and therefore income. A 2007 NSW

government taskforce concluded that, "nature tourism is one of the fastest growing sectors" and that, "it will be important to consider enhancing and developing new nature based experiences either adjacent to, or where appropriate, in national parks and reserves". Plus of course we have the Government, in parliamentary cahoots with the Shooters Party, being pressed to open up even national parks for hunting. The essential *raison d'être* and conservation value of our national parks seems to now count for little in Macquarie Street.

Worse still, there is a range of sporting and recreational groups and many individuals that also seem to want the right to use the parks as *de facto* public active recreation land. Given the population pressures Sydney now faces, this is not surprising. People want to be able to pursue their traditional sporting and other recreational pursuits but are finding it harder to locate suitable space to do so. Further, there are now many new outdoor activities competing for the limited amount of land available. Mountain biking is one current example but it is only one of many demanding access to our national parks. Currently many mountain bikers simply carve out their own tracks in the nearest available piece of hilly country - and that is too often in national parks. The DECC rangers have no power to arrest riders or confiscate their bikes. In addition the parks are chronically under-staffed. Rangers close the trails only to have the bikers immediately open them again.

The question is, should we open up national parks to these destructive activities? If not all, then which

activities should be allowed in, and which should be excluded? There is no doubt that many of the people involved would regard themselves as being nature lovers. The reality is however that the environmental impact that most of these new users will have on the bushland estate over time will be to significantly damage its fragile ecosystems; death by a thousand cuts. This is contrary to the national parks primary purpose of nature protection and conservation.

So, where should we draw the line, and who should draw it? The State Government, you might suggest. Perhaps not. STEP was recently invited to attend a weekend seminar workshop run by World Trail Pty Ltd, a firm specialising in the construction and maintenance of mountain bike trails, that was aimed at addressing the design and construction phases of tracks and trails for mountain bikes and horse riders. Factors that were explored included trail grades, land contours, soil types, trail sustainability, potential risk areas and sensitive environmental areas for various track user groups. To make matters worse it was not just potential mountain bike trails that were being talked about. Specific reference was made to other overseas inspired recreation trends likely to reach Australia in the same way as mountain biking did, including trails for motorised bikes, quad bike trails, 4 x 4 trails and others. There are apparently a dozen or more new and exotic sports just waiting to gain a foot hold in Australia; all no doubt grist to the mill of the fast growing sector of "nature tourism". We understand that the horse riders are again lobbying for greater access. And there is usually a nearby State Government run national park just waiting to host any or all of these activities.

The seminar, surprisingly, was conducted under the auspices of the Department of the Environment, Climate Change and Water (DECC). DECC is of course the department which has responsibility for

the running of our national parks and are the people to whom we would normally look to take the lead in defending our parks against any dangers. In fact, the DECC web site proudly proclaims that it, *inter alia*, has responsibility for:

- managing the state's natural resources, including biodiversity, soils and natural vegetation;
- providing the cornerstone of conservation, along with linked community efforts, through the management of national parks and reserves, and marine parks and aquatic reserves to protect nature and cultural heritage; and
- regulating activities to protect the environment.

We understand that DECC is resigned to the construction of three mountain bike trails in local national parks. If this was to be combined with the closure of all illegal trails and strict policing of rider behaviour and if the trails around Sydney were to be restricted to three and they were only in already degraded bush fringes then one may well say that that would be a vast improvement on the current situation of countless illegal tracks. But with the population of Sydney rapidly heading towards 6 million and beyond and given the gutless performance of many of our politicians (refer, Rudd K. and the deferred ETS) you could safely bet that three tracks would be the thin end of a very big destructive wedge and that funding for their policing and maintenance would never be adequately available.

STEP, as reported on page 2, has been working with DECC and responsible trail bike groups to look for a solution. Without some governmental backbone it won't be easy to find a good one. We would welcome feedback from readers on this difficult issue.



*Left: Newly constructed quad bike trail in the USA. Coming to a National Park our way soon?*

## Metropolitan Strategy Review: Sydney Towards 2036

Article by STEP Committee member Andrew Little

The NSW Department of Planning is calling for comments on the Metropolitan Strategy Review by 30 April. It may be downloaded from [www.metrostrategy.nsw.gov.au](http://www.metrostrategy.nsw.gov.au) where there is the option for online discussion. The public is invited to consider a number of important questions on the long term planning for Sydney. Among these are "Should Sydney continue to accommodate the majority of population growth in NSW? What are the alternatives?" This is an important issue and you need to have your say.

The Metro Strategy forms the basis for both the size and general location of new housing development within each council area of the greater Sydney region. It has already had a detrimental impact on the quality of living in many areas through the introduction of high rise into established low density residential zones and by increasing traffic congestion. High population growth rates for Sydney have also created unsatisfied housing demand and artificially high land and housing prices. This has had a flow on effect on the adjoining agricultural land prices leading to inflated fresh food and vegetable prices. Fresh food and vegetables are now recognised as essential to public health. So what have we learnt? Very little apparently, as the review is allowing for even greater rates of population growth.

Some key features of the strategy by 2036:

- 40% increase in Sydney's population to around 6 million (20% of Australia's population),
- 770,000 new apartments and houses,
- 80% of new dwellings to be within walking distance of existing and planned centres,

- A Sydney Metropolitan Development Authority to be established to manage significant urban renewal with likely special powers to facilitate site development.

It is STEP's view that the population growth of Sydney is not sustainable, leading to a decline both in the environment and in future generations' living standards. The Metro Strategy performance (page 7) already shows evidence for this. In 2005 Sydney ranked 8<sup>th</sup> among international cities in the Mercer Human Resource Consulting Global Quality of Living Survey. By 2009 it had slipped to 10<sup>th</sup> position. It is interesting to note that no city in the survey with a metro population exceeding 6 million ranked within the top 10 for liveability.

London and New York with metro populations around 12.5 million and 19 million rank 41 and 50 respectively. In 1999 the environmental footprint of Sydney's residents was 6.7 global ha/person and this had increased to 7.2 global ha/person by 2004. Both figures are well outside the earth's biocapacity, estimated by Global Footprint Network at 1.8 global ha/person.

In the long term Sydney's population needs to stabilise like many European cities at a level which allows a sustainable high quality of living. The current high population growth rate needs to be significantly reduced with either reduced immigration or a more dispersed distribution of growth to other regional centres within NSW. To have 20% of Australia's population concentrated within one small geographic zone centred on Sydney represents poor planning and is not in the national interest.

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## Fix Pennant Hills Road? Tell them they're Dreaming – Unless!

Article by STEP Vice President John Burke

The discussion about getting traffic more efficiently from or to the F3 at Pearce's Corner has been with us for many years.

The Lane Cove Valley Freeway corridor was established some 65 years ago and abandoned from Epping Road to Linley Point in the 1980s and the remainder in 1995 after it became apparent that it was unsuitable from traffic, social and environmental aspects. Homes have now been built along it. The parameters have of course been altered by the enormous growth of Greater Sydney and the construction of the Sydney Orbital.

The *F3 to Sydney Orbital Link Study* was carried out by Sinclair, Knight, Merz (SKM) in 2003/2004. It concluded that a freeway standard link was required and looked at three general options. Type A considered four options from Pearce's Corner to the M2. Type B was a freeway from the F3 south of the Hawkesbury to the west of the developed parts of Hornsby and linking with the M7 at Blacktown and Type C was further west from the F3 near Kariang through national parks and over the Hawkesbury to the M7 at Dean Park, Blacktown.

The report rejected the two western options because they would have had minimal beneficial effect on Pennant Hills Road (PHR). The report

made the quite logical statement that "the further west the new link, the less traffic would use it" and "the closer the new link is aligned to PHR, the more traffic relief to PHR". In considering Type C, which involved tunnel options, what was known as the 'Purple Option' was preferred by the consultants. Extensive community consultation revealed that almost 50% also preferred that option with two others preferred by about 20% and the fourth by about 10%. You can read the report at [http://www.infrastructure.gov.au/roads/F3toM7Review/study\\_2004.aspx](http://www.infrastructure.gov.au/roads/F3toM7Review/study_2004.aspx) It says "The Purple Option would comprise dual 2km tunnels from the F3, a short (500 metres) section where it would daylight in an open cut adjacent to the railway corridor and in the vicinity of Brickyard Park at Thornleigh, and dual 5.5km long tunnels to the M2."

There has been lobbying by people who prefer the far western option. Some individuals, councils and parliamentarians made such a fuss that the Federal Government set up a *Review of the F3 to M7 Corridor Selection* which was conducted by the Hon Mahla Pearlman and was released in 2007. Her letter accompanying the report reflected the terms of reference that she was given and included the following; (see <http://www.infrastructure.gov.au/roads/F3toM7Review/index.aspx>)

1. *that the assumptions and data used in the SKM 'F3 to Sydney Orbital Link Study 2004' were valid and reasonable at the time of the study;*
2. *that there have been changes affecting land use and transport flows since the SKM Study's publication, but that these changes reinforce the selection of the preferred route; and*
3. *that the SKM Study recommends progress as follows:*
  - a. *the preferred route follow a Type A corridor Purple option and that this be progressed to the next stages of investigation including: detailed concept design, economic and financial assessment and environmental impact assessment; and*
  - b. *a Type C corridor be planned now.*

*The NSW Government indicated in its submission to the Review its intention to develop a discussion paper on the connection of the F3 to the M2 and/or M7. I am confident that my Review has undertaken a sufficiently rigorous and detailed analysis of the proposed connection to both inform and direct any future NSW Government investigations. I would encourage both the Australian and NSW Governments to proceed directly with the next stages of a Type A Purple option link connecting the F3 to M2.*

Despite two expert reports coming to the same conclusion we still have objectors to the proposed tunnel link under PHR. They seem to believe that by building a western link, PHR can be returned to a peaceful urban road. They are dreaming.

STEP opposed all the proposals because we believed that the problem was a transport problem rather than simply a road issue. Roads are but one transport mode and their planning should be done in a wider context. Freight, commuting, demand and demographic factors should all have been on the table. Our submissions are at <http://www.step.org.au/F3M2.htm>

## **So what is to be done?**

Of course a comprehensive transport plan should be developed. Failing that, however, the tunnel under PHR is the best short-term option. Through traffic will naturally use the tunnel but there will still be considerable local traffic and heavy vehicles not wanting to go to the M2. And there would be toll-avoiders. The fact that PHR will become less congested will attract additional cars onto the road and so any relief will be temporary. People will decide to drive instead of catching the train, will seek jobs further from home and so on. Our seemingly inexorable population growth will add to the pressures. There may be fewer trucks on PHR but there will be just as much traffic.

## **A New Approach to the Problem**

So is the idea of returning PHR to a normal suburban street a pipe-dream? It is unless a new approach is taken. Community campaigning should be demanding that:

- the F3 be immediately linked to the M2 by a tunnel under PHR as proposed by the 2004 and 2007 studies;
- a transport study be urgently carried out to optimise commuter and freight movement over the next decades [this should be done first but we have abandoned hope!]; and
- once the tunnel is operating, PHR between Hornsby and the M2 should be heavily tolled with local traffic being exempted – this can easily be done with the same technology that now charges us for using the various toll roads and tunnels.

Such an approach would allow through traffic a faster journey while permanently lessening congestion on PHR. A total transport study would then deal with the contribution that integrated road, rail and cycleways could make for the future.

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## **STEP Committee 2010**

Barry Tomkinson – President/editor  
Jim Wells – Financial Officer  
John Martyn;  
Don Davidson;  
Andrew Little

John Burke – Vice President;  
Helen Wortham – Secretary;  
Tim Gastineau-Hills;  
Robin Buchanan;

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## Dog Pound Creek: diatremes explained

Article by STEP Committee member John Martyn

**Diatreme vegetation.** If you ever feel like a peaceful walk close to home, in tall eucalypt forest with lush rainforest understory (and don't mind the leeches) try Dog Pound Creek (pictured), between Wareemba Ave and Quarter Sessions Roads, Thornleigh-Westleigh. It is a beautiful place, especially when the trunks of Sydney Blue Gums glow in the afternoon sunlight. But it is under pressure from mountain bike riders (see STEP Matters February 2010) and also from weed incursion.



Dog Pound Creek is special in having possibly the best preserved volcanic diatreme vegetation in the Sydney Metropolitan Area, although most is regrowth. There are many other diatremes around the place. Old Mans Valley is nearby but it has a massive quarry in the middle.

Browns Field in Wahroonga is also a diatreme, but largely occupied by a sports oval. Euroka Flat near Glenbrook is mostly grassy parkland; and Peats Crater in Muogamarra is former cattle pasture with hardly any natural vegetation preserved. So Dog Pound Creek is special, but why is it there, and what on earth is a diatreme anyway?

*Left: Dog Pound Creek.*

**Maar Volcanoes.** Dog Pound Creek, like other Sydney Basin diatremes, is the roots of a *maar volcano* of Jurassic age, now eroded down by up to 400 metres below the ancient Jurassic land surface. The word *maar* is a Germanic corruption of the Latin word for *sea* because recent volcanoes of this type in the Rhineland mostly contain lakes. Maar volcanoes form when molten magma invades sedimentary rock layers saturated with water and creates an explosive mix of superheated steam and rock debris.

This mix shatters its way to the surface in episodic events, blasting into the air; the heavier stuff landing nearby and forming cones surrounded by subsiding layers, the lighter debris and dust drifting further afield. Then, because of all the rock removed from depth, the structure collapses inside a ring fault, forming a caldera, a sub-circular depression or crater. The caldera crater accumulates thick layers of erupting debris and its floor continues to sink,

then it eventually fills with water to form a lake, which may be moat-like around a central cluster of cones. Small streams of lava may also flow from central fissures.

Australia has some of the best examples of maar volcanoes in the world, especially in the Atherton Tableland (lakes Barrine and Eacham) and in western Victoria and the Mt Gambier area. And it is possible to visit many of them and understand what Dog Pound Creek, Old Mans Valley and Browns Field looked like in Jurassic times 200 million years ago. I recently visited Australia's largest maar volcano, Tower Hill (pictured below) near Port Fairy. There are lots of good reasons to go there apart from the volcano. Port Fairy is pretty and a great place to stay and the wildlife reserve in the volcano features a more concentrated variety of Australian mammals in their wild state than anywhere I have ever been.

*Below: Tower Hill Pan*



But the volcano alone is impressive. The outer crater rim is about 3 km in diameter, higher on the north-east side due to prevailing prehistoric south-west winds blowing the ash, its inner face steep due to ring faulting. The centre consists of a jumble of overlapping ash and cinder cones up to 80 metres

high accompanied by small lava flows. Between the cones and the rim lies a swampy, moat-like lake system, now sadly depleted by groundwater pumping and weed invasion. You can view all this on Google Earth – Tower Hill is very clear and



obvious against the endless patchwork quilt of paddocks of Victoria's Western Plains.

**Tower Hill and our local diatremes.** Tower Hill formed when magma entered the same water saturated lime stones that form the coastal scenery of the "Twelve" Apostles and London Bridge, and created an explosive mix. This happened from 30,000 years ago to the last eruption around 7,000 years ago. This is *very* recent compared with the Sydney Basin diatremes' great age of around 200 million years. If we were to erode Tower Hill down, comparably, by removing 300-400 metres of land the envelope of volcanic rocks would shrink in diameter from 3 km to probably less than 1 km; and its dimensions would continue to shrink at even greater depths to describe a long, downward-tapering trumpet shape which would terminate against a large mass of solidified intrusive magma, the original heat source. This long, tapering form is the *diatreme*: the word means "perforate through".

## The electricity ladder

Article by Paul Burke\*.

Research carried out for my Economics PhD thesis has identified a national-level electricity ladder that countries climb as their economies develop. The electricity ladder sees countries transition from hydroelectricity and oil to coal and natural gas, and finally to nuclear power and modern renewables, for their electricity needs as their per capita incomes increase. The electricity ladder concept is useful in

If we were to do the reverse, and project Dog Pound Creek 300-400 metres to the former Jurassic land surface, it would expand in area, to be a crater probably approaching 1 km diameter, almost certainly overlapping with craters formed above the nearby Old Mans Valley, to form part of a maar volcano complex more than 2 km long in a north-east south-west direction, by up to 1 km wide: large by world standards.

It is important to take this leap of imagination, because some Sydney Basin diatremes carry the moniker of "crater", notably Campbells Crater and Peats Crater to the north of Hornsby. Even though their presence is the long term outcome of volcanic activity, and in some ways they have crater-like form, they are merely the result of more rapid downward erosion of the volcanic rocks that decompose and weather down more readily than surrounding hard sandstones.

explaining why low-income countries have electricity sectors that tend to be dominated by hydroelectricity and oil-fired electricity generation, while high-income countries typically have more diversified electricity sectors with greater reliance on coal, natural gas, nuclear power, biomass and waste, and wind power (see Table).

**Electricity mix by income level, 2003**

Type of source	-----> General electricity ladder ----->							
	Hydro		Fossil fuels		Nuclear	Modern renewables		
Source	Hydro	Oil	Coal	Natural gas	Nuclear	Geothermal	Biomass, Wind waste	
<i>Unweighted average for all countries in group (percent)</i>								
High-income countries	13.9	14.9	24.7	30.1	13.7	0.6	1.4	0.7
Middle-income countries	32.3	21.7	18.7	21.4	3.9	1.1	0.7	0.1
Low-income countries	53.5	25.0	4.1	16.2	0.1	0.5	0.3	0.0
Australia	7.0	1.0	77.2	13.8	0.0	0.0	0.6	0.3
World	30.4	20.2	17.8	23.2	6.3	0.8	0.9	0.3

Note: An additional 0.1 percent of global electricity production comes from other sources, such as solar.  
Source: International Energy Agency.

For a global sample of 133 countries using annual data from 1960, strong statistical evidence was found in favour of the electricity ladder. It was also found that domestic energy resource endowments have a large impact on the electricity mix. Countries with large fresh water endowments, for example, understandably use a lot more hydroelectricity than otherwise similar countries. Large geothermal resources (as proxied by the number of volcanoes per capita) make countries much more likely to generate geothermal electricity. In Australia, with our large coal endowments, more than three-quarters of electricity is generated using coal.

Countries with sizeable domestic energy resource endowments are also less likely to climb to the upper rungs of the electricity ladder (nuclear power, wind power, and other modern renewables). This helps to explain why Australia has no nuclear power sector and a relatively small uptake of electricity generated using wind, solar, and biomass and waste. Australia's heavy reliance on coal has meant

that the carbon intensity of electricity generation in Australia is among the highest in the world; electricity generated in Australia is 11-times more carbon-intensive than electricity generated in France.

The new evidence on the electricity ladder brings both bad news and good news in terms of future carbon emissions in a growing world economy. The bad news is that developing countries are likely to increasingly substitute toward coal-fired electricity, which will raise the carbon intensity of their generation of electricity. External assistance in the forms of cash, training, and access to low-carbon technologies would improve the ability of these countries to leap over the middle rungs of the electricity ladder (fossil fuels). The good news is that higher incomes eventually facilitate the adoption of low-carbon energy sources, including nuclear, wind, and solar power. As countries such as Denmark, France, and Sweden have shown, substituting to these upper-rung generation

technologies can result in significant reductions in greenhouse gas emissions.

Countries with large fossil fuel endowments, such as Australia, are unlikely to adopt upper-rung electricity technologies without government action. The Australian Government has shown some intent to speed up the country's ascension of the electricity ladder via its ambitious Renewable Energy Target (20 percent of Australia's electricity supply from renewable sources by 2020). The Government's other major climate change policy – the introduction of an emissions trading scheme (ETS) for greenhouse gas emissions – has been thwarted in the Senate.

The Senate's rejection of the ETS is despite near consensus among economists that the most economically responsible way to reduce greenhouse gas emissions (in the electricity sector and across the rest of the economy) is to adequately price the damage done by emitters of carbon, which is what the ETS is designed to do. A

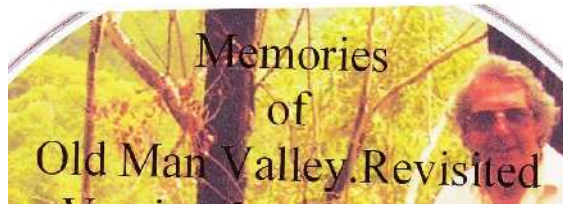
carbon tax could also do the job, but an ETS would be more in line with developments overseas and would allow greater certainty that Australia's total greenhouse gas emissions will not exceed agreed targets. Without an ETS, Australia has no way of ensuring that greenhouse gas emissions reductions can be credibly achieved, or that reductions can be realised in a cost-effective manner. The absence of a carbon price also means that companies face inadequate incentives to invest in low-carbon technologies and sectors. With an election nearing, Australians who care about mitigating the risks of human-induced changes to the global climate should get behind the ETS.

*\* Paul Burke is a PhD Candidate in Economics at The Australian National University. His research on the electricity ladder has been published in Energy Economics and is available at <http://www.sciencedirect.com/science/journal/01409883>. An open-access version is available at <http://econrsss.anu.edu.au/pdf/DP636.pdf> or <http://econrsss.anu.edu.au/discussionpapers.htm>*

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## Can you keep a secret? – Tramways of Old Mans Valley

*Article by Ted Angelo, a local Hornsby historian and a sixth generation Australian descended from a convict heritage. This is part of a series of short vignettes that he has written about the area.*



Hornsby Valley is home to many best-kept secrets. As some of us who have grown up, or lived in this area for a long time, have forgotten many of the episodes that have influenced the direction of our history and heritage. It is important to revisit some of these secrets before they completely fade from our collective memories.

It was sometime in the early 1960's when I came to work for Sydney County Council (present name Energy Australia) at the Hornsby Depot. Part of my work was to test the earthing of the 66KV overhead, which at that time ran along the creek line through the Old Man Valley. Some time in the distant past a set of tram-tracks had been installed to carry the fruit from what used to be Albert Higgins farm to the packing sheds. After Albert was killed in a gold-mining accident at Marble Bar in the Pilbara Region of Western Australia the farm was taken over by his brother Ned Higgins. The descendants of Albert believed that his remains

were returned to Hornsby to be buried in the Old Man Valley cemetery. That was proved to be wrong when I contacted the Marble Bar Council and was informed that he is indeed buried at Marble Bar. My father told me that a coffin full of rocks was buried there to bring some closure for his mother. All the young boys in my age group would remember the raids on old Ned's apple orchard.

Back to the tram tracks. It was a narrow gauge set of light steel rails that ran parallel to the creek line from what is now the boundary of Berowra Valley Regional Park at the end of Rosemead Road up through what is now the quarry. I believe that this structure was destroyed when the area was mined for topsoil some time in the 1970's. The Malcolm Bruce article in 'Guide to Berowra Valley Regional Park' backs up this story (see page 33).

Malcolm writes: "The second tramway was near the southeastern edge of the quarry, behind Dural Street terminating behind Hornsby Aquatic Centre. It was a cable-drawn tramway and was used bring crushed blue metal from the quarry to the hoppers for delivery to road trucks. There was originally a steam traction engine driving the winch, which was replaced in turn by a stationary steam engine, a diesel engine and an electric motor. The traction engine was used in the quarry after its take over by Farley and Lewers".

## Large? Cute? Scary? Or really just soil forming organisms? Another side to bandicoots, brush-turkeys and swamp wallabies

*Article by STEP Committee member Robin Buchanan, author of the recently published "Restoring Natural Areas in Australia".*

You might consider bandicoots just plain pesky, be a bit scared of a large brush-turkey, think wallabies are cute, listen with pleasure to the tinkle of lyrebirds, and curse the ticks and leeches they

bring, but bandicoots, brush-turkeys, swamp wallabies, and lyre birds are all important for the health of the soils, and hence ecosystems, in our bushland areas.

How so? Probably by their most annoying activities; digging the soil, raking the leaf litter and, for wallabies, munching every juicy plant in sight. Brush-turkeys and lyrebirds feed on insects and seeds which are exposed by raking the leaf litter or breaking open rotten logs with their large feet (*Birds*

*in backyards*). Swamp wallabies feed on introduced and native shrubs, grasses and ferns and bandicoots eat insects and other small invertebrates they obtain by digging small, round conical holes at night (*Australian Museum*).



These animals were always part of the northern suburbs ecosystems but they disappeared at various times over the last century or so. Brush-turkeys have declined in numbers since European settlement (*Environment New South Wales*) and I certainly have no memory of them in the Lane Cove River catchment when I was a child. Lyrebirds remain common in outer bushland such as Ku-ring-gai Chase National Park and Berowra Valley Regional Park. Swamp wallabies form no part of my childhood memories of Thornleigh and were very rare when I moved to Mt Ku-Ring-Gai in the late 1970s. Their numbers have surged since then, probably as a response to the cessation of organised wallaby hunts (Fig 1) and the introduction of fox baiting. Bandicoots were common in Thornleigh even into the 1960's but they suddenly disappeared and their re-emergence over the last decade is no doubt due to the intensive fox baiting program.

**Figure 1 An organised wallaby hunt on the Lane Cove River in 1877. Six wallabies are hanging up. Photo from the National Library of Australia. (Borschmann 1999)**

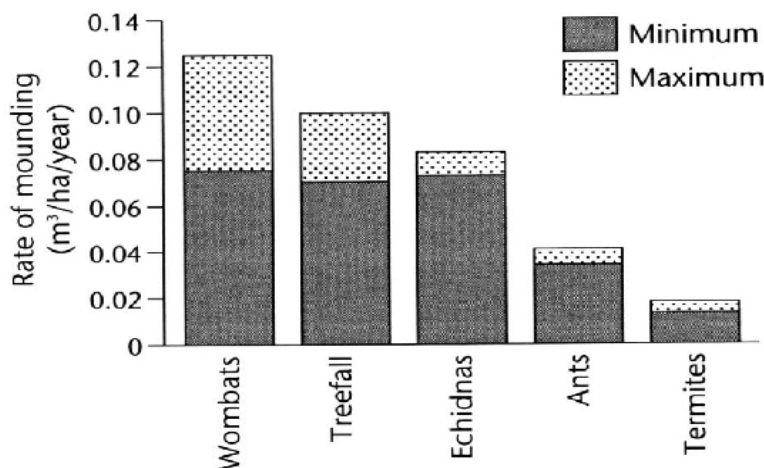
Bandicoots, brush-turkeys and lyrebirds all have basically the same effect on soils; they increase permeability (air and water penetration), turn organic matter into the soil where it decomposes to release plant nutrients and create humus. They also destroy the formation of soil layers created by smaller soil organisms such as ants and worms.

Ants and worms create layers by bringing up only fine gravel, sand and clay; therefore rocks and stones, which provide erosion control and microhabitat on the surface, sink downwards.

Bandicoots, scrub turkeys and lyrebirds dig up the stones again. This process can be quite quick; for example 30 years ago children dropped Smurfs and other small toys into a friend's lawn and ants and worms buried them. Now with the re-emergence of bandicoots and rabbits, the toys have been dug up

from several centimetres down.

While I don't have figures for the average amount of soil turned by these animals, a quick look at Figure 2 shows that even humble echidnas can turn over somewhere around 0.8 cubic metres of soil per hectare per year. I think that our bandicoots, scrub turkeys and lyrebirds could beat that and a few wombats would be useful with up to 0.12 cubic metres moved per hectare per year.



**Figure 2 Rate of soil formation and churning in a dry sclerophyll forest in the southern Tablelands of NSW. (Scott & Pain 2009)**

Swamp wallabies have quite a different impact. They eat lots of nice tasty food up to about 1.3m from the ground and help the rapid recycling of nutrients from plants back into the soil. In summer it only takes about 24 hours for flies to break down the wallaby scats into fine fibrous material spread on the surface of the soil or leaf litter. This fine material is rapidly broken down by bacteria and fungi, the fine organic matter incorporated into the soil and nutrients released; far faster cycling than waiting for a gum leaf to break down.

Now for some speculation, before European colonisation did all these animals help reduce the build-up of leaf litter (fuel) and help reduce fire intensity? I know that in the bush behind my house the understorey is now constantly thinned by the wallabies, very different to thirty years ago. I now have leaf litter buried by ants, bandicoots and occasional brush-turkeys and lyrebirds; therefore less leaf litter to burn and more rapid break down of litter than three decades ago. I have also seen lyrebirds raking away the build-up of shed bark from the base of Sydney Red Gums (*Angophora costata*) while they hunt for insects. Will this help reduce the

spread of flames into the canopy, reduce bark damage, and reduce the formation of hollows and 'chimneys'? Were the lower fire intensity and more park-like appearance often mentioned by early settlers and attributed to burning by Aborigines also a function of the activities of these large animals?

Bandicoots, brush-turkeys and wallabies may be a bit of a nuisance, and on Bushcare sites certainly protect your plants, but our local soils have been ploughed and fertilised for thousands of years by these animals. The mass of leaves and twigs sitting on top of soil only disturbed by small soil invertebrates is only a reality of the last century or so, our local soils need large vertebrates with big feet to churn them over so that they remain healthy.

#### References

Australian Museum <http://australianmuseum.net.au>  
Birds in backyards <http://birdsinbackyards.net>  
Borschmann, G. 1999. *The People's Forest. The People's Forest Foundation.*  
Environment New South Wales  
<http://www.environment.nsw.gov.au/animals/AustralianBrushTurkey.htm>

## Sydney Public Transport Inquiry; who are the winners and who are the losers?

Report by Jim Wells, STEP Committee member and member of the Christie Inquiry.

February 2010 was a stellar month for those of us interested in public transport in Sydney. First of all, we had the government announcement of MyZone

ticketing which included a long overdue tidy up of the Travel Pass system but some unbelievable giveaways on the fares side.

Are you a tax payer? – start complaining. See: <http://www.myzone.nsw.gov.au/>

NSW GOVERNMENT myzone Home About MyZone Tickets

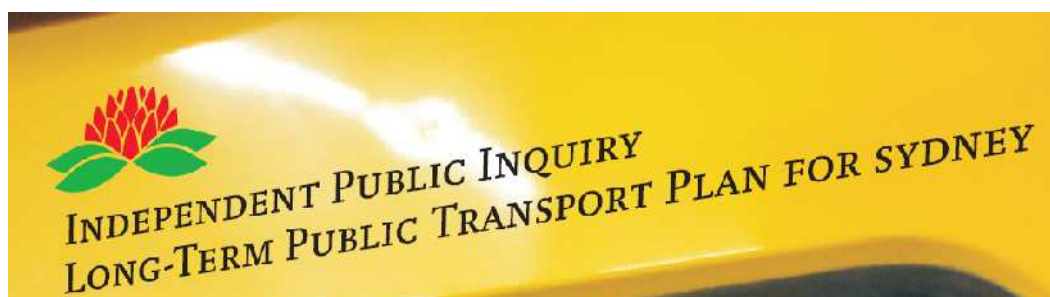
# MAKES MY TRAVEL EASIER

SUNDAY 18 APRIL

**MyMulti**  
3 new 'all you can travel' MyMulti passes will be introduced

**MyTrain**  
Reducing rail fare bands from 20+ to 5

Then we had the Christie inquiry preliminary report. See: <http://www.transportpublicinquiry.com.au/>



Your correspondent was proud to be a member of Mr Christie's team. That doesn't mean he supports it all but it is a major achievement and the report should be in every library in Sydney.

The inquiry had a somewhat naive view that an independent authority (Transport for Sydney) needs to be set up to get away from political meddling. The authority would do what is currently done by the government agency NSW Transport and Infrastructure for Sydney, leaving this agency with country issues, ports etc. The difficulty is that no employee is truly independent in the public sector. Judges get close but the rest are subject to the sack and the possibility that their organisation gets restructured.

The inquiry also did not seriously contemplate a

situation where CBD employment growth would be constrained. If it were, future property development would be mainly residential and the city would become a more vibrant all-hours place. Public transport would become more efficient as there would be enhanced contra flow patronage. This has been happening already. Some CBD office buildings have been converted to apartments.

Having accepted that CBD employment will grow and that public transport is under stress (buses in George Street etc and Town Hall platform 2 in the evening peak over crowding) the inquiry naturally proposed new railways from here to there and trams (light rail) from hither to thither. The main concern is that governments must focus more on public transport and less on roads.

**Then we got the government's announcement: See: <http://www.nsw.gov.au/metropolitantransportplan>**



The principal items being:

- Deferral of the metro
- North West Rail Link (NWRL) by 2024
- CBD relief rail line to Wynyard
- Light rail along Sussex Street from Hay Street to Barangaroo and Circular Quay

The latter is a very disappointing announcement but this is not the place to bang on about Barangaroo except to say there will be very few passengers for this service. Why spend all the money?

So what does all this mean for us gentle folk of the northern suburbs?

First of all, if you are using a private bus to access a

railway station each work day you are a real winner because you will be able to buy a MyZone ticket which allows unlimited bus travel, all operators public and private, as well as rail travel limited to zones. The zone boundary for zones 2 and 3, it is not very clear from the map, will be between Hornsby and Asquith.

You are also a winner if you travel long distance on CityRail using normal fares. Previously CityRail had twenty fare bands; now there will only be five with the last one covering all journeys of 65 km and greater. Currently one can make a journey such as this for very low fares:

### Fare options for Goulburn to Scone (513.54km)

	Adult	Child	Student*
<b>Single</b>	\$22.00	\$11.00	\$11.00
<b>Return</b>	\$44.00	\$22.00	\$22.00
<b>Off-peak return</b>	\$30.00	\$7.00	N/A

But from April 18<sup>th</sup> the single adult fare comes down to \$7.80 – an unbelievable give-away. Sure, hardly anyone makes journeys of 500 km on CityRail but plenty make Newcastle to Sydney journeys of about 150 km.

The next big issue is the North West Rail Link (NWRL), to connect Epping with Castle Hill and Rouse Hill. It's possible that Labour will change their mind about timing if re-elected. The Liberals

have committed to it and would almost certainly start construction sooner rather than later. It's been talked about so often and studied to the nth degree it is bound to happen.

That doesn't mean its good public transport policy. First of all there's the huge expense both capital and operating. Could the money be better spent in other ways? Unless adequate car parking and bus interchange facilities are provided at stations the

NWRL may not really meet needs. The M2 is to be widened. See <http://www.hillsm2upgrade.com.au/project.htm>. If more bus lanes can be provided the current very successful bus service on the M2 could suffice but for the problem of handling the buses in the CBD.

Another major issue for the NWRL is where will the trains run to after reaching Epping? There are three options:

- Through to Chatswood, North Sydney and Wynyard on the slow and indirect route that was opened last year via Macquarie.
- Down to Strathfield and Central which is indirect but could be quite fast.
- On a new line to Gladesville and Rozelle – the Victoria road option. Direct and very fast if stations are spaced fairly far apart. This is the Metro option.

At one stage CityRail had more or less decided that the first option would be their preference; they would extend the existing tunnels at Epping under Devlins Creek. However, the proposed CBD relief line may change their mind as greater capacity will exist for trains running through Strathfield. In this case there will be a 'dive' at Cheltenham, i.e. NWRL trains will come to the surface here and run into either Epping high or low level. Much will depend on the preferences of passengers but hopefully one in three trains could run via Strathfield so eliminating unnecessary transfers at Epping.

Forget the Victoria road metro, that's now a pipe-dream.

Whatever happens services on the Hornsby to

Epping sector will be under pressure as many passengers currently using Thornleigh and Pennant Hills are likely to switch to the NWRL. Don't expect the current fifteen minute headway off peak service to be maintained; even peak ones may be impacted.

Likewise peak hour services to the Upper Shore (Roseville to Hornsby) could be adversely impacted. This arises from the current limit of twenty trains an hour that can run between Chatswood and the City. Currently only four come from Epping leaving about thirteen (currently) for the Upper Shore, but if NWRL means that, say, ten will come from Epping, only ten can come from the Shore.

The solution here has been less talked about and that's sometimes called Chatswood fast rail. A new line would be constructed from St Leonards to Crows Nest, North Sydney (very deep here), and under the harbour probably to connect up with the CBD relief line. Call this the second harbour crossing. The Christie inquiry canvassed an option to build this on a second deck of the Harbour Bridge (Prelim. Report p155).

In the meantime the main thing for the long suffering rail passengers to look forward to is the replacement of the non air-conditioned trains by those currently being constructed Waratah trains. These are likely to be very similar to the 'Oscars' we have occasionally on our Northern lines. Please, CityRail, do something about the pre-recorded announcements on these trains. Those of us sitting in the middle of the carriage do not need to be boomed at with, "Stand Clear – Doors Closing".

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## STEP Activities and Dates for Diary

### STEP Walks Programme

*STEP offers a variety of walks for both experienced and casual ("recreational") walkers. We started the programme in February with a recreational walk and intend to alternate on a monthly basis. The STEP safe walking guidelines apply to both series of walks and all require some reasonable level of fitness. Due to sometimes rough terrain, none are suitable for young children or those with walking difficulties.*

*The walks are aimed at both existing STEP members and any others who simply want to get out into the wonderful local Australian bushland. Normal bush walking standards apply, that is bring your own supply of drinking water, something to nibble for energy, suitable shoes, hat, sun screen, insect repellent and weather protection if required.*

### Sunday 16 May: Boronia Park, Field of Mars Reserve and Buffalo Creek Reserve

This walk provides a perspective of several very distinct plant communities, from coastal salt marsh and wetlands of the Lane Cove River to sandstone gully forest and sandstone ridgetops woodland.

The Field of Mars Reserve contains remarkable variation including remnant pockets of critically endangered Turpentine Ironbark Margin Forest and endangered sandstone-shale transitional forest associated with the boundary of Wianamatta Shale and Hawkesbury Sandstone. Two plant species,

*Epacris purpurascens var purpurascens* and *Pimelia curviflora var curviflora*, are also found here and are listed as vulnerable species under the NSW Threatened Species Act.

**Meet 12:45pm for a 1pm start:** at the edge of Boronia Park at the corner of Park Road and High Street, Hunters Hill. Bring sturdy walking shoes, snack food, water and a hat. Binoculars recommended. Complimentary afternoon tea is provided at the conclusion of the walk.

**Length:** 6 – 7 km

**Estimated duration:** about 3 hours (tea follows)

**Difficulty:** Easy

**Contact:** For more information please contact Tim Gastineau-Hills on 9449 2094 or 0419 251 586 or visit <http://www.step.org.au/walkstaks.htm>

## Sunday June 20: Cumberland State Forest, 95 Castle Hill Road, West Pennant Hills

Cumberland State Forest was established in 1939 after previously being cleared for agriculture in 1908. One third of the forest was planted as an arboretum and the rest naturally regenerated and is an example of current sustainable forest management. We will walk the Forestry Trail which

meanders through eucalypt forest.

**Meet:** Information Centre car park. Enter from Castle Hill road and follow the road through to the Information Centre – approx 1km (Gregory's Map 249 E2 or UDB 171 Q2). Meet @ 9.45.

**Length:** 4 km

**Estimated duration:** 2 hours

**Difficulty:** Moderate

**Contact:** Robert Bracht if you are coming on the walk. Robert's details are [Robert.bracht@hotmail.com](mailto:Robert.bracht@hotmail.com) or 0422 088 305. (At the end of the walk you may join us for coffee at CSF Café.)

## Sunday 11 July: Twin Creeks Track

A pleasant walk from Lindfield Station to Middle Harbour via Two Creeks Track. Return via Little Digger Track to Roseville Station (or short walk back to Lindfield).

**Meet:** Lindfield Avenue outside Lindfield Railway Station at 1 pm for 1.10 pm start.

**Length:** 8 km

**Estimated Duration:** 3 hours

**Difficulty:** Medium

**Contact:** Andrew Little, 9924 7212 after 6 pm

## Saturday 26 & Sunday 27 June: Australian Plants Society

**Guide to the Eucalypts of the Sydney Region - Two Day Workshop presented by Van Klapake.** For further information see: [www.blandfordia.org.au](http://www.blandfordia.org.au)

If undelivered return to STEP Inc; PO Box 697  
Turrumurra NSW 2074

