Bushland and Urban Biodiversity Management in a Changing Climate

Part 4 - Issues Paper

Identification of some issues for management of biodiversity assets at a local government level in eastern suburban Melbourne.

This issues paper forms part of the project
"Bushland management and climate change:
Adapting management practices in response to landscape change"
as developed by the Eastern Alliance for Greenhouse Action.

This project is funded through the Victorian Government's
Sustainability Fund under the Victorian Local Sustainability Accord.

EAGA
EASTERN ALLIANCE FOR GREENHOUSE ACTION

Victorian Local Sustainability Accord

Sustainability Fund Managed by Sustainability Victoria

Victoria The Place To Be

The Eastern Alliance for Greenhouse Action (EAGA) comprises Booroondara City Council, Knox City Council, Monash City Council, Maroondah City Council, Whitehorse City Council and the Yarra Ranges Shire Council.

This project is funded through the Victorian Government's Sustainability Fund under the Victorian Local Sustainability Accord.

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Summary

The Eastern Alliance for Greenhouse Action (EAGA) was established in 2008, to provide a regional framework for local stakeholders to share information and experiences, to implement projects suited to a regional approach, to develop effective large-scale community education programs and to undertake research into greenhouse abatement and adaptation in the eastern suburbs of Melbourne, Victoria.

"Bushland and urban biodiversity management in a changing climate" implements the first stage of a program to assist Local Government Authorities (LGAs) to better manage biodiversity assets on public and private land within their jurisdiction.

The objectives of the project are to:

1. document the needs, issues and opportunities for local government to enable them to support species and ecosystems to adapt to climate change – with a strong focus on biodiversity and bushland management on public and private land; and

2. identify knowledge gaps to enable local government to manage public and private land biodiversity in a changing climate.

This Issues Paper is the fourth part of this project and documents responses to information compiled in the first two parts (Literature review and Projections paper), as discussed in the third part, a workshop for local governments and other stakeholders. There were fifty participants in the workshop, including representatives of five of the EAGA councils.

Key issues arising were:

→ Inadequate resources to provide staff time, expertise, knowledge and technology,
→ Lack of understanding, political will and support from upper management,
→ Disconnection of urban residents from the natural world, leading to lack of appreciation and motivation to take action,
→ Lack of community appreciation of biodiversity values and the importance of open space,
→ Community ignorance, scepticism and fear (of bushfires, in particular),
→ Lack of education; the difficulty of changing community attitudes and behaviour,
→ Pressure of urban development (less open space, fewer large trees),
→ Absence of appropriate ecological burning regimes in urban bushland areas,
→ Fragmentation of habitats, lack of opportunities to establish linking corridors,
→ Lack of information; we still don't know enough about either biodiversity or climate change to be confident we are making appropriate decisions,
→ Lack of regional and statewide communication, cooperation and strategy
→ Lack of influence on, and support from, higher levels of government, and
→ Conflicts between state government and local government planning objectives.

Following suggestions collected at the workshop, a case study to identify the Ecological Vegetation Classes in the EAGA region, select key species, and obtain climatic envelope data for those species is in preparation.

1. INTRODUCTION

Project Background

The Eastern Alliance for Greenhouse Action (EAGA) was established in 2008, to provide a regional framework for local stakeholders to share information and experiences, to implement projects suited to a regional approach, to develop effective large-scale community education programs and to undertake research into greenhouse abatement and adaptation in the eastern suburbs of Melbourne, Victoria. The EAGA committee includes representatives from Booroondara City Council, Knox City Council, Monash City Council, Maroondah City Council, Whitehorse City Council and the Yarra Ranges Shire Council. The current project is managed by a steering committee including representatives of four of the six EAGA councils, a representative of the DSE and the project officer.

This project is funded through the Victorian Government's Sustainability Fund under the Victorian Local Sustainability Accord.

Project Objectives

Climate change represents a major issue for the Australian community, with many emerging risks, as well as some opportunities. It is important that these risks and opportunities are understood regionally and locally, since regional differences in terms of socio-economic characteristics, physical environment and existing biodiversity will significantly determine local communities' vulnerability to climate change, as well as adaptation opportunities that are available to them. Conversely, if local and regional land managers are to be in a position to prepare for and adapt to climate change, then it is essential that they are kept well informed about the issues and are fully consulted about relevant matters.

"Bushland and urban biodiversity management in a changing climate" is a project implementing the first stage of a program to assist Local Government Authorities (LGAs) to better manage biodiversity assets on public and private land within their jurisdiction.

The objectives of the project are to:

1. document the needs, issues and opportunities for local government to enable them to support species and ecosystems to adapt to climate change – with a strong focus on biodiversity and bushland management on public and private land; and

2. identify knowledge gaps to enable local government to manage public and private land biodiversity in a changing climate.

Project parts

Part 1: A Literature Review for issues around climate change and its impacts on biodiversity in general, in Australia and in the EAGA region where possible. Completed in March 2010.

Part 2: A Projections Paper that outlines the potential changes to climate in the EAGA region and the possible regional impacts on biodiversity associated with those changes.

Climate Futures projections were prepared for EAGA by CSIRO during development of the Projections Paper.

Part 3: An interactive workshop with EAGA councils to discuss the projections paper in the context of current local government biodiversity asset management to identify the issues, opportunities and knowledge gaps that need to be addressed.
The workshop was held on Friday, 30th July 2010. A tabulation of workshop feedback is attached as Appendix 2.

Part 4: Development of this Issues Paper to respond to information compiled in the first three parts of the project and to identify gaps, needs and areas for further investigation in a Case Study.

Part 5: Conduct a Case Study with the assistance of ARCUE (Australian Research Centre for Urban Ecology) in order to test the ability of the current knowledge to support changes in biodiversity management and to develop a protocol or tools to help assist local governments.

Part 6: Review the results of the Case Study in conjunction with the Issues Paper and compile a final report to document the outcomes of the project.

2. METHODOLOGY

Overview

The Issues Analysis was based around responses garnered during a workshop, using questions devised by the project team from work done on the Projections Paper with input from the project steering committee.

In total, fifty (50) stakeholders participated in discussions and contributed to feedback sheets.
→ thirty-seven (37) representatives of five local governments (all EAGA members)
→ thirteen (13) representatives from other stakeholder organisations

It is important to note that the workshop process was not exhaustive and the results obtained are not necessarily indicative of broader community views.

Local government and other stakeholders workshop

Purpose of the workshop

Local governments have been identified as a key stakeholder group in the context of a regional response to the potential impacts of climate change on biodiversity, since they are major providers of environment and community services in the region and have, potentially, a crucial role in helping to facilitate community awareness, networking and response to the issue.

In many cases Local Government Authorities (LGAs) are at the front line of natural resource management on both public and private land, and therefore have a very important role to play in biodiversity management. They are managers of public land, regulators of development and planners for land use and patterns of development. They are also the closest government authority to influence biodiversity protection on private land as leaders demonstrating environmentally responsible behaviours, as support for private land-holders in the form of education, training and capacity building, and also as motivators through incentive schemes.

In the Victorian government's "Securing our Natural Future: A white paper for land and biodiversity at a time of climate change" (2009), the roles and responsibilities of LGAs in natural resource management are listed as to:

- Advocate and promote proposals which will benefit the local community
- Plan for and provide services and facilities for the local community
- Provide and maintain community infrastructure in the municipal district
- Undertake strategic and land use planning for the municipal district including: planning for sustainability in nature conservation, energy use and community involvement
- Administrate Victorian Planning Provisions.

In many cases LGAs work with the State government to manage biodiversity assets, particularly where assets overlap or are connected. Key State government agencies involved in biodiversity management include the Department of Sustainability and Environment, Parks Victoria, Melbourne Water and Catchment Management Authorities.

For these reasons, it was determined that a significant group of representatives from all six local councils that are represented within EAGA, community groups and other agencies involved in biodiversity management should be represented in the workshop to discuss and document issues of concern.

A workshop environment was considered to be the most effective and efficient means of providing essential background information and eliciting responses from this group. The workshop was held on Friday, 30th July 2010 at the Karralyka Centre, East Ringwood.

Workshop participants

Representatives from each of the six EAGA Councils were invited to attend the workshop, with the objective of obtaining a cross-section of attendees including councillors, a range of relevant service areas within each Council including environmental management, infrastructure provision, planning and social and community services. Community representatives and other relevant agencies were also invited.

Appendix 1: List of participants

Workshop process

In the morning a series of background presentations were given. This session was introduced and facilitated by Dr Rodney van der Ree from the University of Melbourne and ARCUE (Australian Research Centre for Urban Biodiversity).

The speakers (and presentations) were:
Professor Neville Nicholls – Monash University
Climate science: Media myths about climate change and the IPCC

John Clarke – CSIRO Climate Futures Program
Climate modelling and Climate Futures for Eastern Melbourne

Dr Lynda Chambers – Bureau of Meteorology
Impacts of climate change on biodiversity

Peter Codd – Department of Sustainability and Environment
Local government and Securing Our Natural Future: the Victorian government's white paper for land and biodiversity at a time of climate change.

Madeleine Barton – University of Melbourne
Impacts of climate change on the Common Brown Butterfly in the EAGA region

In the afternoon Gregory Moore from Burnley College (University of Melbourne) introduced and facilitated the workshop session. Participants were grouped broadly according to their local government area and asked to discuss and respond to the following questions:

1. What is the current role of LGAs in biodiversity and bushland management?
2. How do LGAs understand their biodiversity and bushland assets?
3. How does your LGA access, understand and respond to climate change information and issues?
4. What areas do you think LGAs can have the greatest influence over biodiversity and bushland management in response to climate change?
5. What do you see as the current barriers to you successfully adapting your bushland and biodiversity management to changing climate issues?

Each workshop table of participants was provided with prepared sheets for noting responses. The sheets included spaces for recording "Gaps" and "Opportunities". After discussing the questions, each group was asked to present a brief oral report on their findings.

Groups were also asked to record any ideas for a case study that arose from their discussions.

Finally, participants were invited to complete an individual evaluation sheet and responses have been considered in preparation of this paper.

3. KEY ISSUES INDICATED BY WORKSHOP OUTCOMES

Presented here is a summary of responses from the facilitated workshop gathered through feedback sheets and evaluations. Response details are tabulated in Appendix 2.

1. Current role of LGAs in biodiversity and bushland management

Local government authorities were seen as assisting biodiversity and bushland management on private land through three modes of action:

- Community education and support
- Setting an example of good practice, and
- Regulation and enforcement

In managing public land, local government authorities were seen as having a broader and more direct range of modes of action:

- active land management
- long term planning
- protection measures
- working with other land management agencies
- valuing bushland areas in additional ways

In carrying out these roles the following key issues were identified:

→ Lack of resources for program development, promotion and expansion, enforcement/compliance, monitoring/assessment,
→ Ignorance, misinformation and in some cases fear (of bushfires) among landholders, community members, upper management and councillors,
→ Lack of prioritization/valuation of biodiversity as an asset,
→ Inconsistency of regulations and delays in updating them,
→ Development pressure,
→ Inadequate and out-of-date baseline data, and
→ Lack of cooperation and information sharing between neighbouring councils and levels of government

2. Understanding of biodiversity and bushland assets

Participants reported that local governments' understanding of bushland and biodiversity assets is based on:

- Direct observation and assessment – by council employees, contractors and consultants who have extensive personal knowledge and who create and maintain species inventories and monitoring programs, and
- Information obtained from external sources – such as from residents, community ('Friends of …' groups, Reserve management committees) and special interest (Birds Australia, Platypus Conservancy) groups, other agencies (Melbourne Water, DSE), historical records and, for rare and threatened species, management/action and recovery plans.

Key issues that currently mitigate against understanding of biodiversity and bushland assets were identified as:

→ Lack of resources for establishing and maintaining baseline date, conducting audits and assessments,
→ Lack of current data on what we have and how to manage it, available resources are out of date,
→ Lack of expertise and technical understanding (especially in upper management),
→ Lack of communication within and between organizations,
→ Lack of access to information from research bodies.

3. Access, understanding and response to climate change information & issues

Workshop participants reported accessing information on climate change from documents provided by state and federal governments, attendance at conferences and seminars, through the media (including the internet), through networks (such as EAGA) and from other agencies, including the IPCC. Reported responses included direct action such as adoption of appropriate strategies and policies, appointment of dedicated officers, creation of sustainability teams, increasing energy and water efficiency and changes to vegetation management and weed control.

Key issues that limit access to information and discourage effective responses include:

- Inadequate resources limit staff time, availability and involvement and access to information,
- Available information may be inaccurate or hard to comprehend and participants may not have the expertise or time to analyse and understand it,
- The information available is often of a general nature; there is little available research of a local nature,
- There is little information available on the effects of climate change on ecological processes, EVCs, species. Which will adapt and survive? Which will become pests or weeds?
- There is conflict between biodiversity management and other priorities, such as urban development, bushfire protection, amenity and historic values,
- There is a lack of understanding of the importance of biodiversity, especially at upper management levels,
- There is a lack of coordination/cooperation between councils.

4. Areas of greatest influence over biodiversity and bushland management in response to climate change

Workshop participants reported that local government can have the greatest influence over biodiversity and bushland management in response to climate change through more strategic planning and control of development that will prioritise preservation of high conservation value areas, retain native vegetation, manage remnant habitats, address connectivity and build ecological resilience.

Issues that limit local government influence over biodiversity and bushland management in

response to climate change were considered to be:

- → Limited council control of private land management to require removal of weeds and retention of native vegetation,
- → Conflict between high density population and biodiversity preservation,
- → Lack of influence on state and federal government policy,
- → Lack of knowledge on the impacts of climate change on species and habitats and what revegetation strategies will lead to better outcomes,
- → Lack of education to counter scepticism and fear within the community.

5. Barriers to successfully adapting bushland and biodiversity management to changing climate

Workshop participants identified the following key barriers to successfully adapting bushland and biodiversity management to changing climate:

- → Inadequate resources to provide staff time, expertise, knowledge and technology,
- → Lack of understanding, political will and support from upper management, leading to lack of dedicated resources,
- → Lack of community appreciation of biodiversity values and the importance of open space,
- → Disconnection of urban residents from the natural world, leading to lack of appreciation and motivation to take action,
- → Community ignorance, scepticism and fear, fed by inaccurate media coverage,
- → Absence of appropriate ecological burning regimes in urban bushland areas,
- → Fragmentation of habitats, lack of opportunities to establish linking corridors (Biolinks).

The following were identified as specific planning issues:

- → Lack of regional and statewide strategy and support from higher levels of government, and
- → Conflicts between state government planning objectives and local government planning objectives e.g. the 10/30 rule which permits the removal of native vegetation without a council permit.

6. Additional issues raised at the workshop

The following issues were either added to those above or stressed:

- → Pressure of urban development (less open space, fewer large trees) ; we are prioritising development over biodiversity - need to prioritise biodiversity over development;
- →The difficulty of changing community attitudes and behaviour,
- →We still don't know enough about either biodiversity or climate change to be confident we are making appropriate decisions.

4. CASE STUDY SUGGESTIONS

Workshop participants noted the following suggestions for a possible case study:

- **What plants survive in a hotter climate?**
    - Research into the 'climate envelopes' of indigenous species/ possibly just trees
- Increase understanding of canopy changes (e.g. red stringybark, swamp gum)
- Identify indicator species for measuring the health of an EVC...
    - determine if indicators species can be used
- **What weeds will become more pronounced with climate change?**
    - Develop a system or tool for investigate the 'climate envelopes' for weeds
- Investigate the potential expansion of weed species, weediness of native species (e.g. wonga vine, clematis)
- **Value of trees project – Investigate the dollar value associated with bushland reserves to our community.**
    - to provide and additional tool for engaging the community and upper management in bushland conservation (may include heat islands research)
- Investigate the impacts of heat stress on local fauna
- Heath benefits of urban biodiversity

Based on this feedback, brief outlines of three possible case study options were prepared and presented to the project steering committee. These were (italics indicate relevant extracts from the feedback sheets) –

1 Economic value analysis of a small suburban park
Need to further explore dollar value of ecosystem services provided by biodiversity
Need to explore financial value of ecosystem services – a bottom line those less green-minded can comprehend.
It might be possible to select a small suburban park and conduct an analysis to put a dollar value on the services it provides, including such things as influence on nearby property values (and rates income), water management and urban heat island effects.

2 Identify the Ecological Vegetation Classes in the EAGA region, select key species, obtain climatic envelope data for those species
Identify indicator species for measuring the health of an EVC... (determine if indicator species can be used)
Changes to EVCs (loss of wet EVCs with replacement of drier EVCs)
Knowledge of species, Mix changes to EVCs, Ecological process at a local level
If we have existing records from the six councils of the common/characteristic EVCs across the region we may be able to select a number of key species and ask Lesley Hughes to conduct modelling on the climatic envelopes of those species. From this information it might be possible to project possible future changes to the EVCs and provide some basis for species monitoring and management as conditions change.

3 Weeds

What weeds will become more pronounced with climate change???
Expansion of weed species, weediness of native species (wonga vine, clematis)
Protect from loss action and policies threats, eliminate weeds, work together, and build resilience.
Don't know what the plant changes will be in cc...weeds
It might be possible to conduct a similar analysis on weed species to determine which native and exotic species are most likely to be favoured in warmer, drier conditions and are therefore likely to pose threats in the future.

It was agreed that all three possibilities had considerable value and potential. The second option was selected as the case study for this project and preparatory work has commenced. The others will be retained and may be recommended as prospective studies in any future continuation or follow-up to this project.

Appendix 1: Participants List

Boroondara City Council
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Stanley Barker
Ken Dix Dury
Andrea Lomdahl

Knox City Council
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Fay Rimmer
Alan Rimmer

Maroondah City Council
Rebecca Paslow *
Peter Newbigin
Roger Lord
Paul Glover
Nelly Belperio
Craig Mauger
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Brett Naylor
Manu Thomas
Derek Ashton
Lara Molnar
Nathan Wise
Ken McInnes
Margaret Baber
Anthony Diaferia

Whitehorse City Council
Cr Bill Pemberton
Carolyn Edwards

Yarra Ranges Shire Council
Rachel Murphy *
Marty White *
Cr Len Cox
Paul Smitka
Errin Smitka
David Carr
Coral Jeffs
Maureen Bond
Mark Varmalis

EAGA
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Sera Blair

Agencies:
Bronwyn Davies * – DSE
Hayley Broeker – DSE
Michael Hobbs – Melbourne Water
Shane Scanlon – PP & WP CMA

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APPENDIX 2 – Workshop: Tabulation of Workshop Feedback

How do LGAs assist with biodiversity and bushland management on private land within their council area?

Objective	Actions	Barriers	Opportunities/Needs
Through Community Education and Support			
Educate Land Holders	Education on exotic weeds and native plants	Landholder ignorance, fears (link between indigenous plants and bushfire) Biodiversity not a priority for many residents Landholder preferences for exotic plants (that are weeds)	Resources to continue education and increase residents' understanding of what their biodiversity assets are and how to protect them.
	Educational publications, workshops and website	Landholder lifestyle preferences (large house, pool, sheds, tennis court) lead to vegetation removal	Resources, education, planning controls
	Community programs : Gardens for Wildlife	Resources, program awareness	Resources, partnering with other organisations.
Support Land Holders	Rate rebates (e.g. properties with Trust for Nature Conservation Covenants)	Resources to expand program Program awareness	Resources
	Grant Schemes (Biodiversity Buddies)	Resources to expand program Program awareness	Resources
	Assist with grant applications (e.g. Melbourne Water Stream Frontage Grants)	Resources to expand program Program awareness	Resources
Support Community Environment Groups *(this can affect management of assets on private (e.g. Landcare) and public land*	Provide Educational opportunities and promotional materials for themselves or for them to disseminate in the community	Resources to develop materials or to host events.	
		Not enough engagement of community groups in land management	**Community education and engagement to encourage closer collaboration between LGAs and community groups on**

(e.g. 'Friends of' groups).			**management issues; more advisory committees:**
		Benefits of Community engagement not quantified and therefore possibly undervalued.	**Quantify the benefits of community engagement** so that they are adequately valued within LGAs, in particular to upper management
		Not enough community engagement activities (e.g. environment festivals or events).	**Educating schools and community groups, increasing awareness of local bushland... '** **Recreational opportunities (open space & bushland)** **Community festivals**
	Targeted weed control to support plantings	Resources, may be difficult to implement a planned approached over time to get the best outcomes	Resources Multi-year planning, coordinated efforts.
	Resources for land management including weed control, revegetation, etc. (e.g. tools, plants, mulch,	Resources	
	Assistance with grant applications		
By Leading by Example			
Active on-ground Management	Environmental weed control	Resources to allow for appropriate methods and timing	**Resources and planning**
	Use of indigenous plant species for in bushland and non-bushland parks and open spaces	Community ideas of bushland vegetation (i.e. they may prefer European species).	
Planning	Develop plans for the protection and enhancement of bushland and habitat corridors	Lack of willingness of landholders for establishing or maintaining habitat corridors	

	Environmental management plans for development near sites of biological significance	Lack of willingness of landholders to complete EMPs for development and inadequate EMPs developed by consultants. Lack of resources for enforcement of EMPs.	
Through Regulation and Enforcement			
Regulation	Implementation of Planning Policy for vegetation management and protection (Planning & Environment Act) *Including Vegetation Protection Overlays.*	Management of private bushland is outside of LGAs influence with exception of illegal clearances (lack of weed removal laws on private land)	**Create laws and procedures for protection of biodiversity assets and removal of weeds on private land**
		Ignorance of planning act by landholders	**Educate Landholders on Planning Act, their property zones and land management regulations.** Provide information on indigenous vegetation for their property, and weed removal advice.
	Issuing of permits to landholders to clear vegetation	Ignorance of landholders that they need a permit to clear vegetation Confusion of landholders over conflicting net gain and 10:30 rule regulations.	Educate landholders on vegetation removal regulations – particularly in areas with significant biodiversity assets or areas with bushfire risk areas.
Enforcement	Enforcement of native vegetation clearance/ Planning controls for vegetation removal (Planning & Environment Act)	Resources for compliance officers	Resources for compliance officers
	Animals Regulations for natural asset protection	Resources for compliance officers	Resources for compliance officers
	Restrict development in areas of biological significance	Development Pressure	

How do LGAs manage their biodiversity and bushland assets on public land?

Objective	Actions	Barriers	Opportunities/Needs
Through active land management			
Active on-ground management programs	On-ground protection, enhancement and restoration of bushland and biodiversity assets (including specific habitats)	Public Safety	
		Public perceptions of bushland management (desire for exotic vegetation or fears of bushfire etc.)	Education programs to help the public understand the need for protecting natural assets. Potential to show dollar value of retaining good bushland reserves for property values and mitigating urban heat island effect.
		Communication challenges with contractors	
	Assessment and monitoring of assets and effectiveness of actions	**Inadequate funding for and commitment to monitoring and assessment** Not enough mapping of assets Working with old data	**Develop and implement strategic approach and biodiversity benchmarks for assessment and monitoring (of species and reserves)**
	Identifying natural assets & their threats (e.g. habitat hectare analysis and weed mapping)	Lack of resources – reliance on expensive external expertise. Lack of data collection. Lack of expertise in particular on issues around impacts of climate change on natural assets including: • Understanding the likely manifestations of climate change – drought and fire frequency, severe storms • EVCs vulnerable to climate change (loss of wet EVCs with replacement of drier EVCs) • Effect of extreme heat on plant seed production (e.g.	Partner with other agencies (DSE) for information. Work with groups like EAGA to identify key priority areas where expertise is required and then work together to develop and implement data collection methods.

		Dianellas) • Follow on effects of fauna connections with flora – birds, butterflies, possum over grazing on certain flora species • Change in frequency of some flora species (e.g. Wonga vine) • Information to how to manage for climate change (e.g. likely succession of vegetation communities in changing climate) • Suitable street tree species selection • Edge effects • Successful revegetation in drier climates	
Expertise	Use dedicated staff for jobs requiring special expertise e.g. indigenous plant gardener in parks department	Inadequate resources for internal expertise. Reliance on external contractors.	More employment in biodiversity sector Learn from local practitioners, liaise with indigenous nurseries; plant species to propagate and plant viable populations of locally threatened plants
Through long term planning			
	Environment Strategies	Strategies reactive, not proactive Lack of direction & support from upper management Councillors who are climate skeptics Biodiversity not a priority for many residents/council	
	Development of Management Plans for specific assets	Lack of prioritising management areas based on biodiversity assets Often an ad hoc approach rather than overarching assessment and plans	**Make an overarching plan to create and maintain connectivity, to co-ordinate on-ground management and progressive removal of weeds on private property, public reserves and nature strips**

		Reluctance for cross council biolinks	Identifying biolinks and habitat corridors
		Lack of planning for street trees	Block planting of street plants – to ensure new are ready when current ones decline
Through biodiversity and bushland protection measures			
Statutory Planning	**Compliance and enforcement of planning regulations and local laws**	Consistency in planning overlays Lack of enforcement resources	
		Conflicts between different regulations (e.g. 10:30 rule versus Native Vegetation Management Framework).	**Support from DSE to clarify regulations to landholders.**
	Compliance with land management policies and strategies (e.g. sites of Biological Significance)		
Advocacy	**To other government agencies for increased support for LGAs**	Delays in updates to state regulations can delay the ability of LGAs to act (e.g. Noxious weed review) Lack of input from LGAs on reviews of the CALP Act.	More involvement in implementation of CALP Act
By working with other land management agencies			
	Joint programs with State Government agencies: • Melbourne Water Stream Frontage Program • Melbourne Water Corridors of Green • Melbourne Water Watch • Parks Victoria • DSE/DPI • VicTrack	Lack of investment from state government Consistent approach to government agencies (net gain versus 10:30 rule) Information sharing Lack of partnerships between levels of government	Issues transcend council barriers, so need leadership at larger levels (resources versus biodiversity assets) **Build cooperative alliances between neighbouring councils and other authorities**
	Joint programs with community groups: • Friends Groups • Knox Environment Society		

	• Platypus Conservancy • Trust for Nature – Conservation Covenants		
	Joint Programs with businesses: • SP Ausnet • SE Water	Lack of information sharing	
	Working with other councils	Councils with same requirements but different resources Lack of desire to create habitat links throughout municipalities Partnerships between levels of government Lack of information sharing	**Build cooperative alliances between neighbouring councils (e.g. EAGA)**
Through valuing bushland areas in additional ways			
	Bush boulevards – naturalistic street-scaping (indigenous and native plants) Recreation reserves Property Values Landscape aesthetic	These values can be difficult to quantify and therefore usually go unnoticed. No information available to show the dollar value bushland reserves give back to an area for property values etc.	Analyse the dollar values of urban bushland reserves for community values.
		Little information available on value of urban bushland on tackling the urban heat island effect	Get research done on role of bushland reserves in mitigating the urban heat island effect.

How do LGAs understand their biodiversity and bushland assets?

	Actions	Barriers	Opportunities/Needs
Through direct observation / assessment			
	Comprehensive inventories/species lists (flora mainly and some fauna) e.g. Boorondara Flora and Fauna Inventory	**Knowing what we have and how to look after it; Individual species and threatening processes data;** **Maintaining up to date data for biodiversity; Faunal accounts, monitoring Fauna surveys**	Examine current available data and translate into action
	Monitoring programs	**Resources** **Technical Expertise** **Lack of prioritising monitoring and assessment** **Annual funding rounds** Need KPIs for bushland health	Examine current available data and translate into action **Increased monitoring to identify priorities and flag potential issues**
	Internal knowledge (environment officers), ecological assessments & arborist reports (including specific site reports e.g. Gardiner's Creek report)	Lack of understanding/qualification in upper management Lack of communication within organisation	Examine current available data and translate into action
	Engage external consultants to conduct audits and assessments	Resources	
	Do their own habitat hectare analysis for bushland assets (SYR)	Expertise	
	On-ground employee and contractor feedback	Well understood at officer level but not at management level Lack of communication within organisation	Employment of staff (environment and sustainability officers)
Through External Information			
	Information from residents	Not all residents want to retain biodiversity	**Collect local data from residents** **Create partnerships with aboriginal groups and local residents**
	Community records (friends groups, advisory committees		**More environmental advisory committees** **Closer contact between LGA**

	etc.) Maroondah - BRCP?		**and community groups** **More networking: virtual and physical** Data gathering using friends groups, monitoring and recording observational change
	Historical records		
	Birds Australia, Vic wildlife atlas ...	Atlas out of Date	**More networking: virtual and physical** Working with other departments and agencies to update mapping and knowledge of biodiversity assets
	Flora and Fauna Databases from ARI and DSE (includes Sites of botanical and zoological significance)	**Link private industry and research institutions and local government**	**Better use of inter-government information sharing** Better research links, partnerships, with Universities and students to collect data State government research into the effectiveness of council programs in changing behaviours, educating etc. to build efficiency
	Reports from other agencies (e.g. Melbourne Water)	Lack of communication across organisations	**Better use of inter-government information sharing** **Share resources between LGAs and state government agencies and centralise data** **More networking: virtual and physical**
	Rare/Endemic species management plans (e.g. Platypus Management Plan)		**Better use of inter-government information sharing**

How does your LGA access, understand and respond to climate change information and issues?

	Action	Barriers	Opportunities/Needs
Access to Climate Change Information			
Sources for CC Info:	Media, websites	**May be inaccurate**	
	Networks – EAGA and other LGAs	**Time and resources for staff to be involved.**	Further collaboration between research information Different LGAs working together through MAV, Catchment wide projects Work through MAV/RMF to coordinate approach
	State & Federal Government information: • State Sustainability Strategy • Biodiversity & Climate Change White Papers • Agenda 21	**May not have specific information about council areas.**	Further collaboration between research information DSE to provide options to local government as to how to respond / communicate data
	IPCC	**Lack of expertise in understanding, lack of time and resources to reference**	
	Climate change community conferences and seminars	**Staff Time Attendance Fees**	Further collaboration between research information
	Other Agencies, Water paper directions 'forums'		
Responses to Climate Change Information			
Direct Action	Biodiversity/ Climate Change Strategies and Action Planning	**Lack of resources** **Lack of interest from upper management** **Conflict of biodiversity management and other land management issues (development, amenity, fire**	DSE to provide options to local government as to how to respond / communicate data Catchment/region wide projects (e.g. living links) coordinated by external agencies Structure programs to reach broader audience and try to shape government policy

		protection, historic values etc.) **Access to information** Lack of policy / strategy /staff Conflict between fire management and biodiversity management	
	Operations Department – implementation of plans related to management of biodiversity	**Access to information** Lack of policy / strategy /staff	Employment of staff (environment and sustainability officers)
	Sustainability teams and officers **Dedicated officer, resource mgmt strategy,** focus on emission reduction, **fleet, energy** and govt reports.	**Lack of info on climate change and biodiversity expertise, especially at the local level** Lack of policy / strategy /staff	Further collaboration between research information
Energy Efficiency	Energy reduction programs such as light bulb exchange	**Access to information**	
Water Efficiency	Water saving and energy saving designs in council buildings Implement new techniques/technologies, e.g. water sensitive urban design **Water recycling and stormwater capture, rainwater tanks**	**Access to information**	New technology water sensitive urban design
Vegetation management	**Planting w**arm season grasses for sports fields. Changing the tree species planted Carbon planting programs	**Access to information** **Need to know how plant species will respond to drier or more variable conditions**	**Research into "climate envelopes' of indigenous plant species to determine which are likely to survive a drier climate into the future and which are likely to die out.**

		Lack of knowledge of species mix, changes to EVCs, Ecological process at a local level	Central body to coordinate research
	Weed Management	**Access to information** **Need to know how climate change will affect different weed species, which will become new or larger problems and which native plants may become weedy**	**Need research into climate envelopes of key weed species.** Central body to coordinate research
Education			
	Sustainable gardening- by council – and education for community		
	Environmental festivals, Invite experts/ Host climate change seminars		
	Support community groups (e.g transition towns)		
	Lobbying other levels of government – coordinating at grassroots level	Lack of coordination and cooperation between councils LGAs only respond to policies	Need to further explore dollar value of ecosystem services provided by biodiversity
	Develop and strengthen habitat corridors across all management areas to allow native species to adapt and move with climate change.	Lack of understanding or maintenance of habitat corridors	**Need to promote the value of habitat corridors**
	Upper management	Lack of political will	**Engage upper management in development of vegetation strategies.**

			Need to further explore dollar value of ecosystem services provided by biodiversity

What areas do you think LGAs can have the greatest influence over biodiversity and bushland management in response to climate change?

	Barriers	**Opportunities**	**Needs**
More strategic planning (open spaces, street trees...) **and development control** Setting priority for preservation of high conservation value areas Managing core biodiversity assets well Build resilience – know what you've got, how to maintain and protect it,	Strength of planning overlay in biodiversity asset protection Conflict between high density & population issues and preserving biodiversity Feeding info up the government chain to influence change in policy Cross organisational agreement – within LGAs	Stricter local planning **Improve understanding of likely impacts of cc on local biodiversity and plan for adaptive management** Better coordination across councils and lobbying together	
vegetation retention & management of remnants Local on ground action, on council owned reserves, roadside management 'support programs for other land manager, public and private Hydrologic engineering programs to promote biodiversity outcomes	**Weeds on private land**		**Laws for removal of weeds on private land** Funding, promoting, organising, educating community programs – local events, community buy in
	Removal of native vegetation on private land	Community engagement and education /local media, give-aways financial incentives local events....	**Resources** **Support from State government to enforce vegetation removal laws** Funding, promoting, organising, educating

			community programs – local events, community buy in
	Threatened Species	Building up populations of threatened plant species; Propagation of indigenous species, Sourcing local species from other area	
	Not enough knowledge of revegetation methods for better outcomes		
Planning overlays and acquisitions to address connectivity (habitat corridors/biolinks)	**Lack of information on species and climate change impacts on species habitat** Don't know what the plant changes will be in cc...weeds		Use of web based info
Develop well informed and involved local community that are prepared for CC Practical education and assistance to private and public landholder support programs Education, demonstrating, **lead by example**, show the way to the community	Community education to tackle scepticism and fear in community to help them be prepared. Sceptics	Influence community activity/thinking, community involvement, friends groups G4w, rate rebates Public education; Try and bridge gaps in understanding on climate change – correct false info	Use of web based info
Advocacy role, Influence up chain for policies			

What do you see as the current barriers to you successfully adapting your bushland and biodiversity management to changing climate issues?

Barriers	Opportunities	Needs
Resourcing issues money, knowledge, staff, lack of technology....		More Cross departmental knowledge and shared learning and sharing of responsibilities.
Lack of political will / support from management - leads to lack of resources		More Cross departmental knowledge and shared learning and sharing of responsibilities.
Lack of specific expertise – climate change officers		More research into impact of this area and issues with other LGAs
Lack of information/understanding	Link with research institutions, other council etc to get data collection	More research Share knowledge More Cross departmental knowledge and shared learning and sharing of responsibilities.
Lack of monitoring and assessment / longitudinal studies	More research into impacts of cc on key species for LGAs	More research into impact of this area and issues with other LGAs
Lack of control over climatic factors/species survival – beyond our control what will adapt what won't	More research into impacts of cc on key species for LGAs	
Lack of community appreciation of biodiversity values and open space in general *Disconnection of residents with natural world,* No appreciation of local or urban biodiversity, Lack of motivation of people to act	Educate community in importance of biodiversity	Support across LGAs to promote the values of biodiversity conservation across the landscape. More outreach in terms of nature education, incentives for saving biodiversity on private land etc.
Community ignorance scepticism and fear - **fire, change, tree roots, leaf fall... Public pressure for creating fire buffer zones in reserves -** *fed by (inaccurate) media*	Educate community in importance of biodiversity	Continue education programs in schools and the community. Partner with other groups to provide information. Lead by example.

NIMBY attitude – help community get balance between lifestyle and adapting to change (density housing)	Educate community in importance of biodiversity	
Community desires for lifestyle	Educate community in importance of biodiversity	Control with planning, encourage education of program like' Green Home' by ACF.
<u>Planning issues</u> *Lack of region and state- wide strategy/vision and support from higher levels of government* *Conflict of state govt planning objectives and local planning objectives, e.g. 10/30*	More research into impacts of cc on key species for LGAs	
Conflict of interests – e.g. excessive and inappropriate use of herbicides in weed control – can impact on the biodiversity it is trying to protect	More research into impacts of cc on key species for LGAs	Long term planning for weed removal – particularly in sensitive area. Look for less destructive and broad scale methods.
Lack of burning regimes in urban bushland areas		Work with CFA and DSE to get joint outcomes.
Lack of biolink opportunities; Loss of linking habitats	Implement habitat corridor strategy	Work with other LGAS, and State Government to plan for biolinks. Needs resourcing and planning.

Additional Issues / Challenges / Opportunities

- Opportunities for better assessment, planning and monitoring
- Need for greater coordination/cooperation between LGAs
- Need from greater support for LGAs by State & federal govts
- Already doing a lot
- Policy enforcement knowledge, landscape scale challenge that transcend council boundaries
- Data resourcing program and build collaboration
- Don't know enough about bd or cc
- Advocate
- Encourage gov't and unis to build knowledge base and show leadership but .....in mean time we can build resilience
- Protect from loss action and policies threats, eliminate weeds, work together, and build resilience.
- Risk management balance bushland versus fire management or hazardous tree management

- Biodiversity includes: indigenous, native and exotic (cf. Bushland)
- Planning of public open space to allow for maximum diversity
- Planning scheme amendments
- Importance of large trees (natural social, built, environment)
- Bushland and biodiversity management techniques.
- Setting our management priorities to help understand assets
- Planning for maximum diversity (indigenous vs exotic) Biodiversity and bushland different..place for both (planning schemes to have green spaces and trees etc
- Longitudinal studies, changes over time.
- **Pressure of urban development (less open space, fewer large trees) Prioritising development over biodiversity - need to prioritise biodiversity over development;**
- **Community behaviour change (How??)**

Case Study Ideas

Case study needs to be achievable in a 1 month timeframe and be useful to as many EAGA councils as possible to advance their understanding on or ability to manage biodiversity and bushland in a changing climate. Potential Case Study Ideas highlighted.

- What plants survive in a hotter climate? Research into the 'Climate envelopes' of indigenous species/ possibly just trees
- Adaptive plant lists (e.g, shift towards species adaptive to cc) e.g. yellow box
- Adaptation fauna species in response to cc
- Increase understanding of canopy changes (red stringybark, swamp gum)
- Trial variety of plant provenance methods
- Identify indicator species for measuring the health of an EVC... (determine if indicators species can be used)
- What weeds will become more pronounced with climate change? Develop a system or tool for investigate the 'climate envelopes' for weeds
- Investigate the potential expansion of weed species, weediness of native species (wonga vine, clematis)
- Effect of cc on recreation/sport fields
- Value of trees project – Investigate the dollar value associated with bushland reserves to our community. (to provide and additional tool for engaging the community and upper management in bushland conservation) (may include heat islands research)
- Investigate the impacts of heat stress on local fauna
- Reduced stream flows – enviro and health impacts
- Stormwater flooding
- Impact on water tables and soil moisture content
- Faunal surveys, wildlife officers
- Effect of climate change on local residents and council staff
- Heath benefits of urban biodiversity

APPENDIX 3 – Workshop: Compilation of Participant Evaluations

EAGA Workshop: 30 July 2010

Bushland and biodiversity management and climate change:
Adapting management practices in response to landscape change.

Did this workshop increase your understanding of the potential impacts climate change could have on biodiversity in the EAGA region? How?

WH:

- Yes, some specific info and examples to reinforce understanding

BD:

- No;
- Yes, showed probable impacts on plants and animals that has already begun
- yes, impacts greater than I suspected.
- Yes, presentation by Lynda

MD:

- Yes, opened up the Pandora's box of impacts and the breadth of impacts we are yet to get the grasp on with projection we will be more equipped to research further and hopefully plan for more informed way forward.
- Yes, improved awareness of impacts

KN:

- Yes, confirmed changes are occurring
- Yes, more detailed info on the changes expected, gaps in knowledge
- Definitely, time shifts between flowering and pollination and similar effects
- Yes, many ways, very informative
- Yes, the impacts that shifts in rainfall and temperature could potential impact on species

YR:

- Yes, confirmed my scepticism of state gov't authorities, lack of research and support facilities for local gov't. Interesting presentations and case studies on potential impacts to reinforce my understanding.
- Yes, providing the paper before the event with detailed info. Understanding of the complexity of modelling.
- Yes, made me understand need to monitor change and the complexities of biodiversity.
- Yes, increased understanding by providing accurate data

Unknown:

- Yes, armed me with more scientific facts to deal with myths and case studies to refer to
- Better understanding of likely effects of cc and the science behind projections and the myths
- Yes, better understanding on how cc can affect the whole system
- Yes, broadened my perspective
- Yes, great speakers from broad to local info
- Yes, hearing different thoughts and experiences of different councils has been very enlightening

- (FO= friends of) Yes, climate details most useful

  Professionals:
- Not really (already know)
- Yes, great presentation by Lynda on impacts on species
- Yes, increased understand of extent of cc and the future climate scenarios
- Yes, Lynda and Maddy's presentations

  Casey:
- yes, expert speakers presented well state of knowledge

Did this workshop increase your understanding of your role in biodiversity management in a changing climate? How?

WH:
- Yes, people from diff orgs and levels gave variety of perspectives

BD:
- No, yes, showed BD mgmt has become essential
- Need to plant a wide diversity of trees
- Yes, various viewpoints in the room make you appreciate the role you play

MD:
- Yes, cc and temp range and tolerance of genus species with EVC veg is knocking them about and species will meet natural range problems.
- Yes, but there is so much more we need to know...
- Yes, need to ensure adaptive management and monitoring

KN:
- Assisting community to ask questions at diff level of gov't my role very important to protect and enhance biodiversity into future.
- Food for thought and info on importance of monitoring
- Probably not, communication important
- Yes it did, I will be thinking more about it and encourage more indigenous species in gardens.

YR:
- Overarching value of protecting what we have left.
- Yes, need to consider the important of surveying in to order to identify changes and to combat them
- Yes, raised awareness of issues

Unknown:
- Yes, highlighted these needs should be further in our list of priorities
- Increased number of questions and concerns I have in regards to my role in bushland and biodiversity management
- Yes, how difficult and complex it will be and commitment from gov't will be very important
- Not greatly, my role administration
- Yes, reinforces an appreciation of monitoring
- Yes, to increase our efforts we are currently doing and identify gaps
- (FO) Yes, generating awareness

Professionals:
- Will help me disseminate information
- Yes
- need to discuss question of the right tree choice

Casey:

- yes, highlighted need for better leadership from gov't to council to community

Did this workshop help you identify any challenges or opportunities for managing biodiversity in a changing climate?

WH:

- Challenges, lack of funding and support from higher level of gov't, lack of coordinated planning.
- Opportunities: more co-op between other LGAs and other gov't depts. Community Engagement and Communication

BD:

- opp for networking, potential for advocacy, importance of LGA to provide leadership to counteract media and fed govt. Challenge of communicating problem to public
- Yes: need to co-ord all levels of gov't and disciplines and departments, achieving good outcome even in diff circumstances
- Challenge – community education

MD:

- Yes, to enhance green links for benefits of municipality
- Yes, many challenges, need to communicate urgency of action and the value of action on cc to achieve the moderate trajectories rather than continue to the extreme
- Improved understanding will allow me to better educate others, there are plenty of opportunities, just need upper management will

KN:

- Challenges increase when evaluating all aspects of changing climate. Leadership by federal and state authorities to assist LGAs.
- Yes, full and frank discussion of range of issues
- Propagation of some indigenous plants that could be under threat
- Understanding plant selection in the future could be affected
- Need for protection and retention of biologically sig sites and extend boundaries to create linkage.

YR:

- convey dollar value of biodiversity to community and council, lack of knowledge banks and research available. Lack of cooperative structures between authorities – conflict in planning policies compliance. Expectations of local government too high, must be funded by state and federal government.
- Changing boundaries of habitat limits and what that means for lines on the map of property ownership.
- Need for monitoring and on-ground action, education, strategic programming.

Unknown:

- Continue to highlight to whole of community issue
- Yes, raise many questions and challenges, opportunities for further discussion would be beneficial
- We don't know enough about biodiversity
- Many, need for authorities and community leaders to seek out change to progress to resolutions

- Identified many gaps including lack of change in management due to no definitive answers. Identified importance of data collection.
- (FO), Yes

Professionals:

- Heightened my awareness for improved communication and collaboration between councils
- To work with RMF in some way to increase higher management within EAGA and prioritisation of biodiversity and climate change.

Casey:

- yes, need to keep learning and share what we learn and promote value and importance of our natural biodiversity and the threat cc poses.

Was the level of information in the presentations appropriate for your needs?

WH:

- some quite technical and not helped by small text size

BD:

- yes; good presentation of problem but no solutions
- Yes good mix of general and specific
- Yes

MD:

- yes, topics were informing and interesting
- yes, although some technical data hard to digest
- all excellent, Biodiversity White paper could have been clearer in terms of council role

KN:

- A good start but still not many answers to questions being asked on issues
- Yes, good speakers, clearly presented
- Excellent
- Yes, very good
- Yes, very informative

YR:

- Yes, most stimulating, workshop summaries illuminating helped me to appreciate YR council more.
- Yes
- Yes
- Most was very good...some a little above me

Unknown:

- Some a bit scientific
- Excellent
- Yes, good
- Excellent selection of relevant information leading in to discussions
- Yes, useful
- Yes, very informative
- (FO) Yes

Professional:

- I am more a provider of information for councils
- Yes and no, great examples but needed more visual clues when looking at predications

Casey:

- Climate scenario model a bit complex for the average punter

Do you have any suggestions for what the Case Study should focus on?

WH:

- Cooperative/collaborative, community engagement and education

BD:

- a range of Melbourne flora and fauna species and climate change adaptability, $$ grassland, bushland ecosystems for essential services; solutions;
- ID Suitable indicator species (insects, fungi, microbes) to help assess and monitoring biodiversity quality and health.

MD:

- expansion of weed species via private and open space. Rate of establishment versus rate of removal.
- $$ ecosystem services, emergent weeds, health benefits of biodiversity in urban landscape
- Expansion of weeds, particularly native species becoming weedy...

KN:

- effects of CC on EVCs, flora and fauna, what are acceptable levels of loss if species are protected regionally.
- Monitoring the monitoring...what info have council's commissioned themselves, changes over time,
- Identify indicator plant species that could be used to indicate health of an EVC

YR:

- is anyone meeting the challenge better than others, any good news stories
- techniques for tackling climate change

Unknown:

- Expansion of weeds
- Focus on ideas on what we can actually do to manage biodiversity. Discussion of possible outcomes and management strategies would be beneficial
- Weed species
- Adaptations of species range from present range, identifying range of vulnerability from which it may be possible to develop management strategies and focus conservation efforts
- Look at species that are becoming more opportunistic
- Effect of long term drought on local eucalypts
- (FO) focus on threatened EVCs, indicator species in each EVC (e.g. it's too warm when xxx decreases)

Professionals:

- Problems in regions councils are dealing with
- Impacts of extreme hot days on biodiversity and society
- Taking all the barriers recognised and trying to overcome one. The issue of gaining higher level management support.

What elements of the workshop did you find useful?

WH:

- good variety of speaker and workshop opp to share ideas.

BD:

- Chamber and Barton's specific effects, Climate Future, discus role of LGA in cc bd mgmt; speakers useful and workshop opportunity, knowledge hidden amongst participants
- All of it.
- Presentations, chats over breaks and round table discussions

MD:

- John Clarke brilliant
- Debunking media myths, climate projections for EAGA region, workshop thinking (Greg Moore's vignettes)
- All aspects, especially Nicholls, Clarke and Barton

KN:

- All
- Networking, range of views, what things still need to be done – motivation.
- Case studies
- Role of media in providing misinformation about climate change
- Presentations and group discussion

YR:

- insight into the life of the scientists
- brainstorming
- local data on climate change

Unknown:

- Info on specific topics – e,g butterflies
- All interesting and beneficial, particularly the background info on climate futures and the effect on butterfly life cycles
- All info present
- All very useful including networking
- All...
- (FO) presentations

Professionals:

- Useful to discuss issues with people with a range of backgrounds
- John Clarke's talks!!!
- Afternoon workshop, networking, Greg's facilitation

What elements of the workshop did you *not* find useful?

WH:

- too much sitting and listening

BD:

- useful to meet up with kindred spirits in LGAs. Makes it even more interesting how Tony Abbot can dismiss global warming as crap.

MD:

- DSE White Paper
- None, all good

KN:

- Nill, a very good day of networking
- Nill
- None
- Discussions of the political side

YR:

- none

Unknown:

- None
- None
- (FO) Workshop session might have been better narrowed to actions around specific issues and successes that could be emulated by others

Professionals:

- Nitty gritty of climate modelling
- too many long presentations

Additional Comments:

- Good range of speakers
- Greg Moore good – always provoking.
- Need to reach upper levels of LGAs to highlight need for action and develop further understand of impacts on biodiversity.
- Great
- Excellent workshop, well done!
- Great work
- Research institutions need to invest more efforts in informing local council on recent research findings.