



## FACT SHEET 2

### *Considering climate change:*

## Adaptation strategies for biodiversity conservation in the Peel Region

Biodiversity<sup>1</sup> is likely to be impacted by climate change through the added stress that it places on the survival of native species, increases in bushfire frequency and intensity and changing hydrology. A warming and drying climate will require species to either move to more suitable habitat, adapt to the changes, which is difficult given the predicted accelerated rate of climate change, or they will become locally extinct.

Biodiversity management is a core function of local government through its roles in natural resource management, planning and land use management, water management and through support of community groups managing natural systems. Many of the adaptation responses identified for local government are an extension of work already being undertaken.

In practice, local governments' responsibility to conserve biodiversity means the protection of bushland, natural areas and native vegetation across private lands and council managed lands. This is to conserve native plant and animal species and ensure they can continue to exist and evolve.

Local Governments can protect biodiversity on private lands by controlling development and offering support to landowners who have bushland on their properties. Local governments also manage a variety of local reserves with bushland, wetland, riverine and estuarine areas for public enjoyment.

Through workshops agreement was reached on the following Goals.

### Goals

Local government can consider 7 goals to ensure biodiversity (B) management addresses the challenges posed by climate change:

- Goal B1. Resilient natural systems that are able to self-adapt to climatic changes and provide protection against extreme events.
- Goal B2. Well-connected local and regional ecological linkages.
- Goal B3. Adequate resources for natural resource management.
- Goal B4. Well-managed water supplies that contribute to environmental flow requirements to meet conservation objectives.
- Goal B5. Well-managed water and vegetation that prevents and repairs damage by salinity and acid sulphate soils.
- Goal B6. Well-managed wetlands that maintain diversity and character.
- Goal B7. Planning that incorporates biodiversity values.

### Principles

In addition, all policies and strategies to address climate change adaptation for biodiversity conservation should have regard to the following principles:

1. Manage biodiversity for existing and new threats: climate change will exacerbate existing threats to biodiversity, change the nature and extent of threatening processes and will itself act as a stressor.
2. Demonstrate a strong commitment to biodiversity conservation with a focus on ecosystem services and diversity.
3. Provide adequate levels of investment for the management of natural systems.
4. Adopt a regional approach to adaptive biodiversity management with a focus on partnerships and collaboration.
5. Continue mitigation actions to reduce the extent of adaptation required.

<sup>1</sup>Biodiversity is the natural variety of life including native species, ecological communities and their genetic make-up.

## Strategies

The following strategies have been developed in consultation with local government officers in the Peel region, representatives from the Western Australian Local Government Association, the Office of Climate Change (WA), the Peel Development Commission and the Peel-Harvey Catchment Council, and are consistent with the Federal Government policy direction outlined in *Australia's Biodiversity and Climate Change (2009)*.

### Regional collaboration for biodiversity adaptation

Climate change effects on biodiversity will not be contained within local government boundaries and will require collaborative efforts to manage impacts and increase adaptive capacity. Regional collaboration will share the costs and benefits across a number of councils/partners and will demonstrate commitment and an established partnership approach; increasingly important in the competitive grants sector.

Table 1 includes strategies to encourage regional partnerships.

Table 1: Strategies to encourage regional collaboration and partnerships to integrated adaptation into biodiversity conservation.

Strategy No.	Action
Strategy B1: Publicly state Council's biodiversity policy	To maximise funding opportunities (e.g. grants) clearly define Council's "biodiversity position".
Strategy B2: Maintain support for Natural Resource Management framework	Maintain support for Natural Resource Management, 'Friends Of' and other groups. These groups provide valuable capacity to maintain and improve natural areas in the Peel region and are a source of local knowledge.
Strategy B3: Support a regional environmental peak body	Support a regional environmental peak body to keep highly skilled practitioners and their expertise in the region (e.g. PHCC) to provide regional and localised information and resources.

### Maintain functioning natural ecosystems: connectivity and diversity

Highly diverse ecosystems are more resilient and are expected to adapt better to changing climatic conditions. Habitat connectivity allows for 'self' adaptation and movement of species into more suitable habitats as climatic conditions change. *'In many cases it may be more cost-effective to direct funds towards measures which help species adapt and survive in-situ, such as enhancing ecosystem resilience, allowing for genetic translocation to boost evolutionary potential or providing refuges from extreme weather'* (Isaac, 2010). Habitat clearing remains one of the most significant effects on loss of biodiversity. In heavily settled or modified habitats, assisted migration or establishment of migration corridors may be required to enhance species survival.

Table 2 presents strategies to maintain functioning natural ecosystems.



Table 2: Strategies to maintain ecological diversity and connectivity.

Strategy No.	Action
Strategy B4: Develop a Peel regional biodiversity plan and budget	Identify regional priority areas for conservation (as per South West Biodiversity Project Guidelines) and develop a regional management plan, work plan and budget to ensure that these areas are protected. Formalise and resource to protect a comprehensive and representative array of landscapes, ecosystems and species in the Peel. Landscape diversity, patches and connectivity of habitats should be represented in reserves and in other land tenures.
Strategy B5: Establish new and strengthen existing biodiversity targets	Establish biodiversity targets such as: <ul style="list-style-type: none"> <li>• purchase of significant areas</li> <li>• strategic rehabilitation and revegetation management throughout the catchment</li> <li>• revegetation of degraded areas to increase diversity and connectivity</li> <li>• multiple use landscapes</li> <li>• management for transformation of ecosystems</li> <li>• increased connectivity, especially in and between diverse landforms.</li> </ul>
Strategy B6: Develop innovative subdivision options	Develop innovative subdivision options. Provide incentives to developers to protect significant natural areas and planning for management costs as part of the development process. Incentives should be provided to owners where natural areas remain in private hands.
Strategy B7: Develop and implement private land conservation initiatives	Develop and implement private land conservation initiatives – including formal conservation covenants (National Trust, Department of Environment and Conservation (DEC) or Department of Agriculture and Food Western Australia (DAFWA)) and the less formal 'Land for Wildlife' scheme. Covenanted land should be consistent with the Local Planning Scheme because any inconsistency will favour the Local Planning Scheme (Molloy <i>et al.</i> , 2007).
Strategy B8: Provide financial incentives for private land conservation	Provide financial incentives, such as rates rebates, or investigate tax incentives for conservation initiatives.
Strategy B9: Develop strong vegetation protection policies	Encourage retention of, and minimise clearing of, remnant native vegetation through development of, or incorporation into, native vegetation policies.

### Manage environmental stressors

Climate change is expected to favour species that are highly adaptable to change, which are often pest and weed species. Climate change will exacerbate existing stressors, encourage new stressors and act as a stressor in its own right.

Table 3 presents strategies to manage environmental stressors.



Table 3: Strategies to manage environmental stressors.

Strategy No.	Action
Strategy B10: Regional weed and pest campaign	Adequately fund a regional campaign to manage existing weed and pest threats and identify and develop management plans for emerging pest and weed species.
Strategy B11: Weed management information	Inform the community and landholders about existing and emerging weeds and best practice management techniques.

## Carbon Sequestration

Vegetation acts as a carbon sink and is a net accumulator of carbon. Vegetation clearing releases stored carbon into the atmosphere and also reduces the capacity of the system to store greenhouse gases. The protection and planting of vegetation is one method of carbon sequestration, the process of storing carbon dioxide in a solid material through biological or physical processes.

Carbon sequestration is a climate change mitigation strategy, and was supported through the workshops and consultation process.

Table 4 presents a strategy for carbon sequestration.

Table 4: Strategies to sequester carbon.

Strategy No.	Action
Strategy B12: Pursue opportunities to sequester carbon through native vegetation plantings	Identify and pursue opportunities in carbon sequestration for native biodiversity plantings to facilitate natural resource management. Revenue generated through the sale of carbon credits is to be returned to natural resource management activities to fund ongoing management.

## Strategic planning directions

The Peel is a vibrant and growing area. Demand for housing and infrastructure is placing increasing pressure on natural areas and may contribute to rising greenhouse gas emissions through poor planning and construction. Balancing social, environmental and economic demands will require a thorough understanding of natural areas and the expected effects of climate change, and this knowledge will need to be incorporated into planning processes.

Table 5 presents strategies to integrate climate change adaptation into land use planning.



Table 5: Strategies to integrate climate change adaptation into land use planning.

Strategy No.	Action
Strategy B13: Identify and protect significant natural areas	Identify areas of significant biodiversity and incorporate these natural areas into town planning schemes, and district and regional plans to ensure they are adequately considered and incorporated into planning activities.
Strategy B14: Prepare a Peel region biodiversity policy	Prepare a biodiversity policy and associated guidelines to inform planning. The process outlined in the Perth Biodiversity Project is ideal for this purpose. Biodiversity policies should include such things as protection, offsets, mitigation of biodiversity loss due to development, and community involvement in planning matters.
Strategy B15: Integrate existing plans into local planning schemes	Integrate existing plans, such as the <i>Peel-Yalgorup Ramsar Site Management Plan</i> , into local planning schemes.
Strategy B16: Develop a regional 'recreational activity framework'	Develop a regional 'recreational activity framework' to identify locations suitable for a range of activities (such as trail bikes). Combine this with an education program and incentives/disincentives to discourage activities from environmentally sensitive locations.

## Resources and funding

Funding for natural resource management activities has typically been low and disjointed, which inhibits long-term planning and consistency of approach, and creates disillusionment within the industry and volunteers.

Table 6 presents strategies to ensure adequate resources and funds are available for biodiversity conservation.

Table 6: Strategies to ensure adequate resources and funds are available for biodiversity conservation.

Strategy No.	Action
Strategy B17: Develop a regional funding scheme for biodiversity conservation	Develop a regional funding scheme (e.g. Peel Region Environmental Levy to be implemented under the <i>Local Government Act 1995</i> ) to fund: <ul style="list-style-type: none"> <li>• identification and implementation of regional biodiversity conservation priorities and development of annual work plans and regional budget</li> <li>• incentives programs for private land conservation schemes</li> <li>• stakeholder engagement, community information and awareness – advising people about what the levy is being used for and seeking input into developing priorities.</li> </ul>
Strategy B18: Provide budget support for dedicated Conservation Officers	Provide budget support for dedicated Conservation Officers to enable community initiatives to be undertaken.

## Integrate biodiversity and fire management

Fire is a natural part of the Australian ecosystem; however, the impacts on biodiversity of predicted increases to fire risk and an increasing number of fire days need to be better understood and more carefully managed at a regional and subregional level.

Fire management plans for natural areas, including bushfire response plans, need to sensibly balance the need to protect people and property with the need to conserve biodiversity. Fire management plans for specific sites and estates are usually developed with the involvement of the local government, land manager and FESA.

Frequency of fire in natural areas impacts the assemblage and composition of species in an area. Overly frequent fires will generally benefit opportunistic/weed species over native species. Physical disturbance of the ground, such as newly built fire access tracks, or vegetation clearing, can create new areas for weeds to take hold if not properly managed. In turn many weeds have annual life cycles, which significantly increase fuel loads in summer. Table 7 presents strategies to support fire management being carried out in balance with biodiversity and having access to the best available research.

Table 7: Strategies to integrate fire management and biodiversity conservation.

Strategy No.	Action
Strategy B19: Revise and develop fire management plan for natural areas.	Integrate fire management practices that maintain levels of public safety whilst conserving biodiversity. This can be achieved through fire management plans developed for natural areas in consultation with FESA and local governments and land managers.
Strategy B20: Locally-based research of inter-relationships between fire management and biodiversity	Identify opportunities to partner with research organisations to ensure that policy development and implementation is based on locally relevant research.

## Waterways and wetland management

Wetlands and waterways in the Peel region provide habitat and feeding grounds for many species including migratory birds. In recognition of its importance, the Peel-Yalgorup wetland system has been recognised internationally under the Ramsar Convention as a wetland of international importance. Wetlands and waterways are also popular with people, and development pressure is an ever present threat.

The key tools used to manage wetlands, especially those in development areas are the protection of buffers and development setbacks, and the preparation of foreshore management plans. It is important that foreshore management plans ensure that coastal and riverine development maintains a balance between environmental and social needs, and that development setbacks and wetland buffers leave room for climate change related sea level rise. Table 8 presents strategies to increase the resilience of wetlands, especially estuarine and riverine wetlands, against climate change related impacts.



Table 8: Strategies to increase the resilience of wetlands and waterways.

Strategy No.	Action
<p>Strategy B21: Implement regional plans and guidelines which protect wetlands and waterways</p>	<p>Implement the <i>Peel-Harvey Water Quality Improvement Plan</i> and ensure that Water Sensitive Urban Design guidelines are implemented in development proposals.</p> <p>Implement the Department of Planning's draft <i>Guideline for the Determination of Wetland Buffer Requirements (2005)</i>.</p>
<p>Strategy B22: Conduct a regional strategic review of foreshore management plans</p>	<p>Undertake a regional strategic review of coastal, wetland and waterways management plans and develop regionally consistent guidelines for managing these areas with respect to potential climate change impacts.</p>
<p>Strategy B23: Manage environmental flows for waterways and wetlands</p>	<p>Manage groundwater levels and water flow requirements for healthy wetland and waterways habitats through bore licence allocation, waterwise education, and stormwater capture and reuse.</p>
<p>Strategy B24: Adopt the Ramsar Management Plan</p>	<p>Adopt the <i>Peel-Yalgorup Ramsar Site Management Plan</i> and adequately budget for staff and community to implement recommendations.</p>



## Informed management

Regionally specific, relevant and accurate information is vital for the management of biodiversity and a well informed community. Developing a sound understanding of what biodiversity resources are available, how things are changing and which management practices are effective (or not) is vital.

Table 9 presents strategies to support more informed decision making.

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Strategy No.	Action
Strategy B25: Develop partnerships to conduct research	Develop partnerships with research institutions to minimise gaps in our understanding of climate change on species and ecosystems in the Peel.
Strategy B26: Develop an understanding of climate change on pest species	Develop an understanding of the impact of climate change on probable changes in numbers of pest species and their distribution throughout the region.
Strategy B27: Implement a Community Education Strategy	Implement a Community Education Strategy: successfully managing climate change impacts on biodiversity will need to involve all sectors of society, hence it is vital that members of the community understand: <ul style="list-style-type: none"> <li>• conservation values and principles and the role of ecosystem services</li> <li>• climate change is a significant driver of biodiversity change</li> <li>• the need to manage for a changing environment</li> <li>• that mitigation is vital to ensure that minimal adaptation is required.</li> </ul>
Strategy B28: Establish monitoring sites to develop a greater understanding of change	Establish monitoring sites, such as photo reference points and objective measurement systems, to develop a greater understanding of change occurring.
Strategy B29: Record and publish information	Establish information recording protocols; especially using non-technical specialists in the region. Involve schools and community groups in local monitoring programs.

