



Aerial photo taken in 2011

Note timber stockpiled on the upstream side of Clos Crossing bridge after recent heavy rain

3 The urban edge

This section describes urban edge features, including bushfire asset protection zones and infrastructure.

3.1 DEFINING THE URBAN EDGE

Urban edge features need to satisfy the *TAMS Design Standards for Urban Infrastructure No.20 - Urban Edge Management Zones*. The planning objective for the urban edge zone is to ensure an appropriate interface between the urban area and surrounding public and unleased land. This requires the establishment of an adequate buffer strip inside the riparian corridor containing:

- Management fencing
- An adequate fire break
- Access tracks for land management and other maintenance authorities
- Public access
- Catch and cut-off drains
- Electricity and other services

Features relevant to the urban edge are described below and illustrated in **Figure 9**. The estate development plan (EDP) for Coombs is being developed by LDA. The buffer strip between the riparian corridor and Coombs will typically be a minimum of 17-18 m wide, depending on topography and other site-specific factors. Detailed planning and design of the urban edge will be done during preparation of EDPs, the River Park Concept Plan and Plan of Management.

3.2 ASSET PROTECTION ZONES

Australian Bushfire Protection Planners (ABPP 2005 and 2006) assessed bushfire risk for the Molonglo Valley in accordance with the requirements of *Planning for Bushfire Risk Mitigation* (ACTPLA), the *Strategic Bushfire Management Plan for the ACT* and the *Australian Standard for Risk Management (AS/NZS 4360: 2004)*. A further assessment was done (ABPP 2010) to determine the bushfire risk from the Pink-tailed Worm Lizard habitat at Coombs. The options presented in the recent assessment are being considered by the LDA in consultation with other agencies.

ABPP (2010) recommended that:

- The outer asset protection zone (APZ) along the river corridor should be 100 m wide (APZs are schematically defined in **Figure 8**)
- A 50 m wide inner APZ should be provided to the north-west of the Coombs development precinct, which faces Misery Hill (inner APZ to be measured from the house property boundary)
- A 40 m wide inner APZ should be provided to the remainder of the riparian corridor
- The ember zone (HAPZ) for the residential precinct should be BAL 29 for 100 m plus BAL 19.0 for the next 150 m, in accordance with *Australian Standard 3959-2009 Construction of Buildings in Bushfire Prone Areas*
- The stormwater detention ponds on Holdens Creek, Weston Creek and the internal creek lines should be maintained as an inner APZ

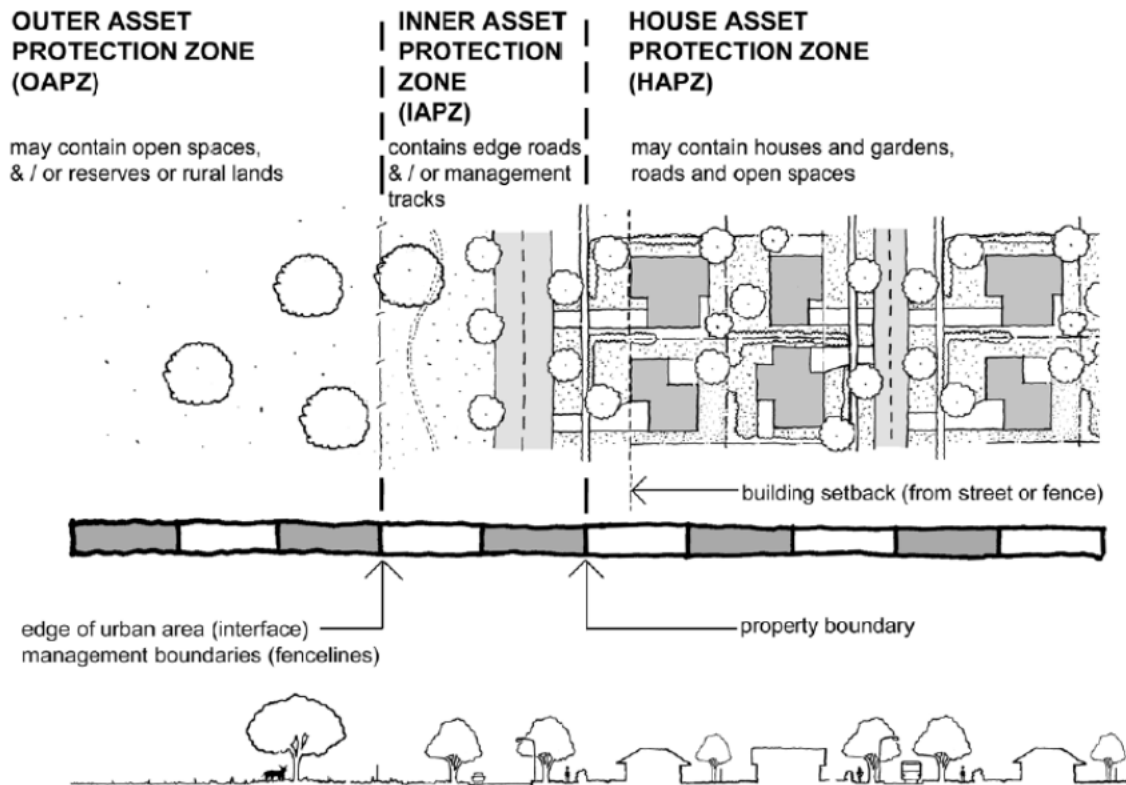


Figure 8: Bushfire asset protection zones (ACTPLA 2008)

3.3 INFRASTRUCTURE

Locations that may be suitable for accessing the riparian corridor via local roads in the Coombs subdivision will be shown on the EDP. Detail design of the perimeter road and connecting tracks will be undertaken subsequent to this Strategy. Signage will be designed and installed in accordance with TAMS standards³.

The urban development will feature stormwater detention ponds designed to protect the river from urban pollutants runoff (proposed locations shown in Figure 5) and an associated stormwater pipe network. Water sensitive urban design features will be incorporated in the urban development in accordance with *Waterways – Water Sensitive Urban Design General Code* (ACT Planning and Land Authority 2009).

Construction of water, sewer and other services within the corridor will need to avoid impacts to sensitive areas (such as Pink-tailed Worm Lizard habitat and buffers) and be rehabilitated to a condition consistent with the principles and objectives of this Strategy. Urban edge design should also consider how infrastructure can be maintained with minimal environmental impact (e.g. position pipework beneath unsealed roads).

³ http://www.tams.act.gov.au/_data/assets/pdf_file/0003/34671/DS25_Standard_Drawings.pdf

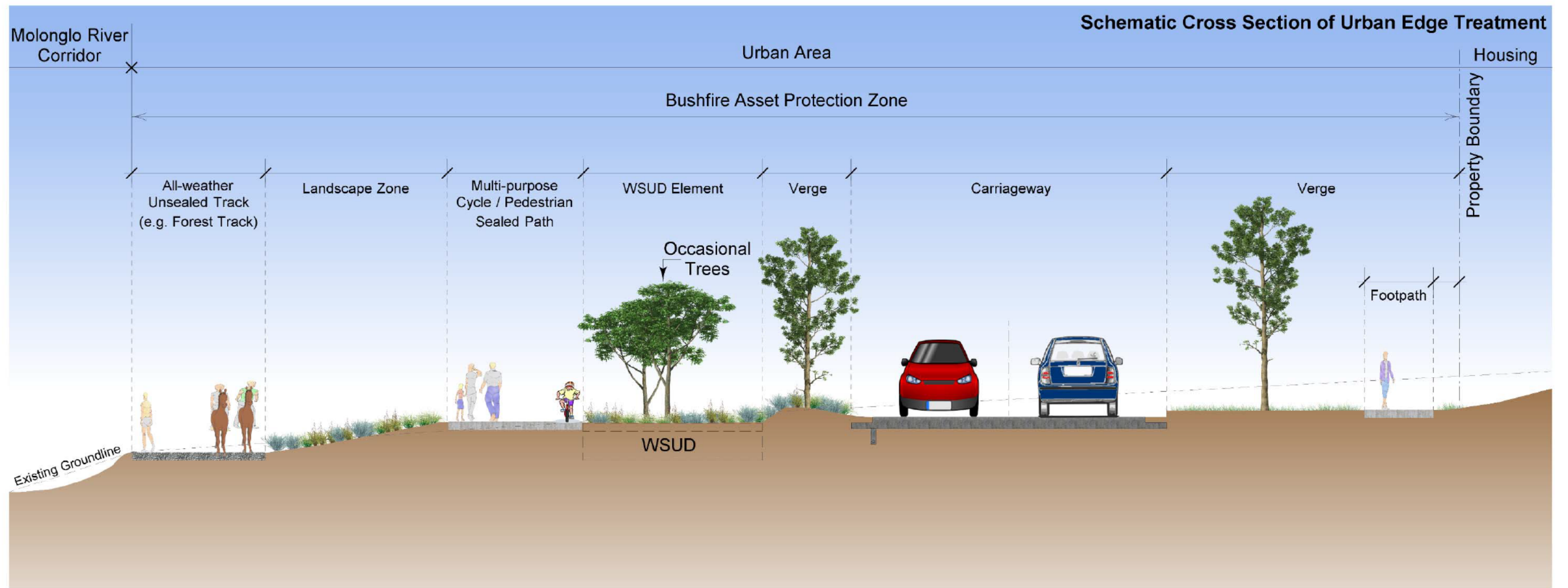


Figure 9: General concept plan for the urban edge

4 Management framework for corridor

4.1 PRINCIPLES

The following management principles and objectives have been developed following consideration of the corridor's values and issues:

- The corridor is to be managed so that it provides for public and community use of the area for recreation and education while ensuring that natural values and biodiversity are maintained and improved
- Rehabilitation/improvement of the corridor is achievable and will require substantial, coordinated, ongoing management and resources, particularly in the short to medium term
- Consistent with best practice bush regeneration principles, high priority should be given to conserving and enhancing better quality areas of habitat within the river corridor. Biodiversity can disperse from these core areas as bush regeneration is implemented. Bush regeneration includes natural regeneration and recolonisation where this is possible e.g. by removing weeds and reducing disturbance to the river corridor caused by stock and other factors
- The ecosystems of the Molonglo River corridor and adjacent areas are important for habitat and landscape connectivity at both local and regional scales and any new facilities and management should seek to maintain and improve connectivity
- Existing river crossings and recreational tracks need to be reviewed for their suitability, and where appropriate, maintained and improved. Additional tracks and formal crossings should take into account the natural and biodiversity values of the river corridor
- Rehabilitation/improvement of the riparian corridor requires activities and impacts within the adjoining and upstream sub-catchments to be addressed in addition to localised impacts within the study area
- An adaptive management approach is needed because of the rapidly changing landscape associated with adjacent urban development and removal of past management regimes e.g. pine plantation and grazing

Environmental managers often deal with considerable uncertainty and complexity about how ecosystems and the physical environment interact. Adaptive management is a widely accepted approach to natural resource management that involves learning from implementation. By following the adaptive management cycle, practitioners ensure that learning is focussed on management needs and that new knowledge feeds back to inform future management choices.

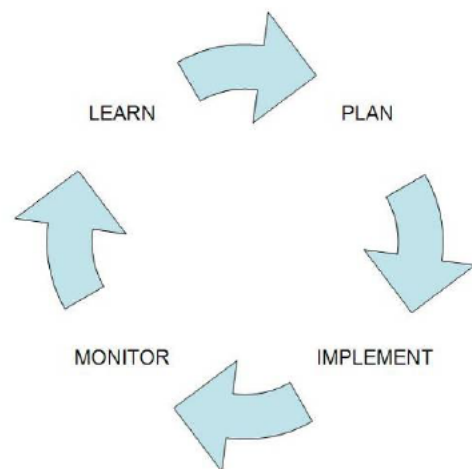


Figure 10: Adaptive management cycle

4.2 OBJECTIVES

The main objectives for the study area are tabulated below.

Table 1: Objectives for the study area

ISSUE	OBJECTIVES
Biodiversity	Protect Pink-tailed Worm Lizard habitat and increase the population Enhance biodiversity Rehabilitate native vegetation communities and associated fauna habitat Improve ecological connectivity with surrounding non-urban areas Reduce populations of pest plant and animal species Maintain or improve small bird habitat in riparian vegetation Allow water flow and fish passage within the river Improve water quality and aquatic ecosystem health Ensure bushfire regimes satisfy ecological requirements
Recreation	Facilitate safe crossing over the river for pedestrians, horse riders, and emergency vehicles Provide connectivity with the surrounding track/road network, including the urban area and Bicentennial National Trail Provide recreational facilities such as open space areas, seating, signage, viewing areas and access routes in areas of low ecological value
Other	Involve the community in ongoing protection and management of the riparian corridor Minimise risk of bushfire to assets in surrounding areas Apply an integrated and cost effective management regime

4.3 PRIORITIES

Suggested timeframes are as follows:

- Short term – Within two years
- Medium term – Three to ten years
- Long term – Beyond ten years, with gradual improvement over time

As a general rule, highest priority should be given to actions that will maintain and improve better quality areas or that abate serious threats (e.g. weeds of national significance). This approach is consistent with best practice principles for bush regeneration and riparian management as outlined in Buchanan (2009) *Restoring Natural Areas in Australia* and Lovett and Price (2007) *Principles for Riparian Lands Management*. Priority should also be given to maintaining and improving selected tracks and river crossings.

4.4 RESPONSIBILITIES

The following table outlines the roles and responsibilities for implementation of the Strategy.

Table 2: ACT Government agencies responsible for implementation

ORGANISATION	SECTION	RESPONSIBILITY
LDA		Estate Development Plan, construction management in urban areas
ACTPLA		Strategic Assessment, EPBC referrals, structure and concept planning, infrastructure planning and development approvals Engage consultant to prepare the River Park Concept Plan
TAMS (LMP)	Conservation Planning and Research	Wildlife research, ecological surveying, biodiversity monitoring
	Asset Integration, Design and Development	Capital works design and implementation
	Parks and Conservation	Management of national parks, reserves and rural land Coordination of community and volunteer groups Strategic recreation planning Natural resource protection Forestry and Fire Management
	City Services	Planning and management of urban parks and reserves and the public domain, including, lakes, street trees, public open space and city places Management of pest and weed control programs Licensing and Compliance
Department of the Environment, Climate Change, Energy and Water	Natural Environment and Resource Management	Conservator of Flora & Fauna Administer <i>Nature Conservation Act</i> and <i>Environment Protection Act</i> Secretariat to the NRM Council ACT environment grants Delivery of Caring for our Country initiatives in the ACT Funding to assist agencies, and catchment and Landcare groups coordinate and undertake works on ground
Territory Venues and Events	Stromlo Forest Park	Major events
NCA	Risk and Planning	Upstream management & Lake Burley Griffin Emergency risk planning
ESA	Risk and Planning	Emergency risk planning Monitoring of performance against Strategic Assessment commitments
Commissioner for Sustainability and the Environment		Monitoring of performance against Strategic Assessment commitments

Other stakeholders that could be involved in funding (grants) and/or practical implementation include:

- ACT Natural Resource Management Council
- Local catchment groups (Molonglo Catchment Group)
- ANU and University of Canberra
- ACT and South East Region Conservation Council
- ACT Flora and Fauna Committee

- National Water Commission
- Murray Darling Basin Authority
- Australian Government Department of Sustainability, Environment, Water, Population and Communities (responsible for administering the EPBC Act and Caring for our Country programs)
- Greening Australia
- RiverSmart
- Indigenous employment and training programs

It is proposed that TAMS (LMP) establish a team to develop the detailed Plan of Management (following preparation of the River Park Concept Plan) and conduct the on-ground works in parallel with development of the Coombs subdivision. The team could be internally resourced or engaged as a contractor. This approach has several advantages because the team could:

- Prepare more detailed habitat/vegetation maps and site plans consistent with the Strategy and River Park Concept Plan (e.g. mapping pockets of good habitat, scheduling weed spraying)
- Retain detailed knowledge about the site management e.g. effective practices/techniques
- Provide a clear point of authority and responsibility, which would facilitate communication with agencies, developers and the community
- Assist with relevant work for the urban subdivision e.g. removal of Blackberries, plant or seed supply for landscaping, bushfire control burns, removal of excess dead timber
- Respond quickly to environmental cues e.g. weed growth following rain
- Have an ongoing commitment to care of the area
- Prevent problems that may arise during development in relation to threatened species and communities and help to deter vandalism
- Manage fire threats and fuel loads

Even if an on-ground work team is established to implement the Strategy, there would need to be input from a range of agencies and other organisations.

4.5 FUNDING

Initial stages of implementation of the Riparian Strategy will be closely aligned to development of the Coombs subdivision and funded by LDA. Additional grant funds and in-kind contributions should be sought from a range of sources, for example:

- Territory and Commonwealth government environmental grants (e.g. through the ACT Natural Resource Management Council)
- Community volunteers (e.g. Molonglo Catchment Group, Bush on the Boundary, schools, scouts) can assist with bush regeneration and revegetation

The Chief Minister and TAMS (LMP) are currently considering proposals to develop a 100 km multi-use trail around the ACT. Funds associated with this may help to cover the costs of improving the track network in the riparian study area.

The Australian Government's *Caring for our Country Business Plan 2010-11* identifies the following priority issues of relevance to the Molonglo Riparian Management Strategy and should be investigated as a possible source of grant funds:

- Biodiversity and Natural Icons – increasing native habitat and reducing the impact of invasive species
- Community Skills, Knowledge and Engagement – including Community Action Grants to support community groups to undertake projects in other Caring for our Country national priority areas

5 Strategic action plans

This section describes strategic actions recommended to maintain or improve the values of the Molonglo riparian corridor. These strategic actions provide the basis for the subsequent development of the River Park Concept Plan and a detailed Plan of Management. Key actions have been prioritised according to the following themes:

- Biodiversity enhancement and conservation including protection and rehabilitation of terrestrial and aquatic habitat, pest plant and animal control, and maintenance of conservation buffers
- Provision of recreational access and facilities including tracks, river crossings and open space areas, erosion control, water quality improvements
- Fire management including buffers, fuel management, emergency access (this discussion is additional to that described in **Section 3**)
- Community participation
- Monitoring

5.1 BIODIVERSITY

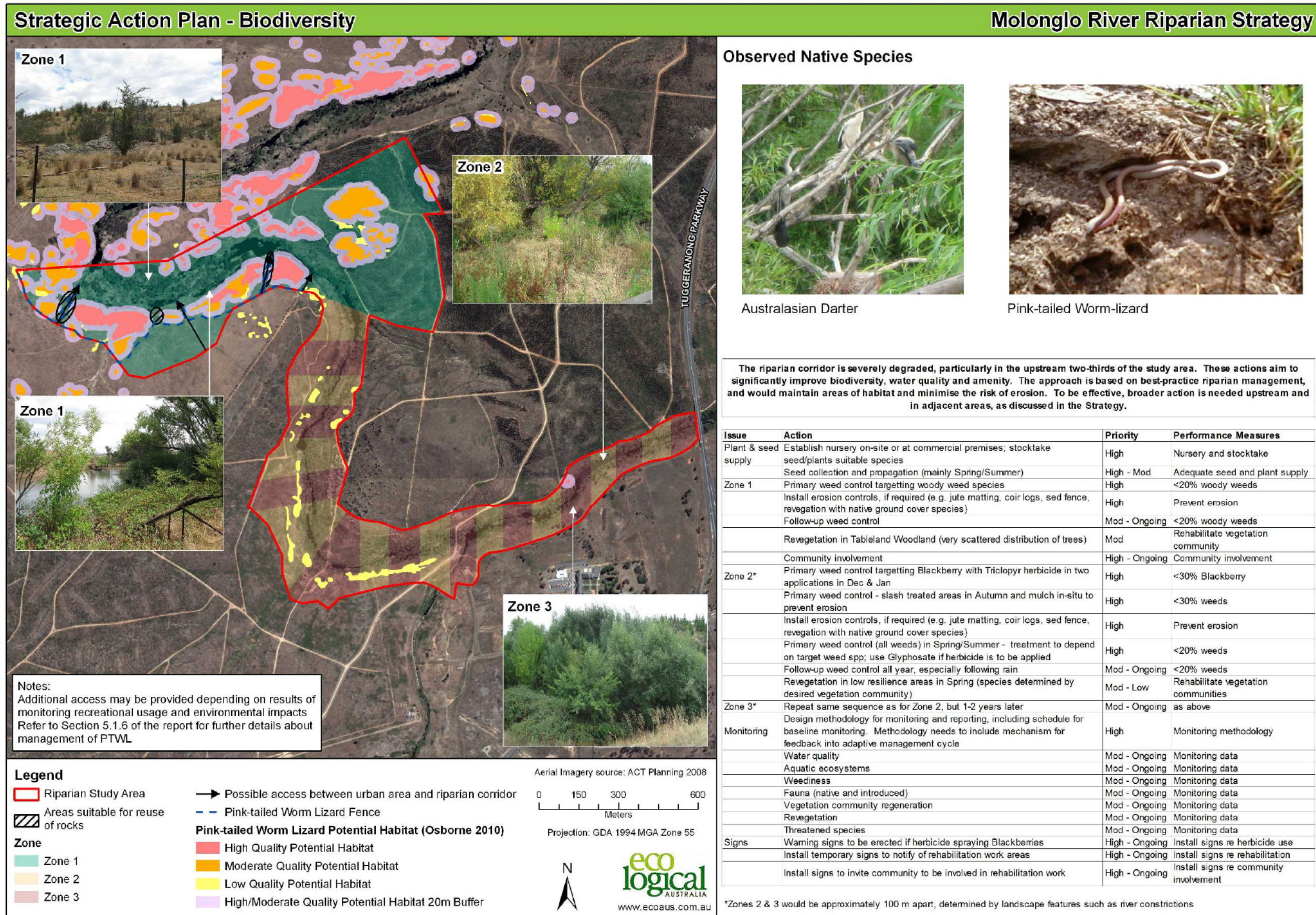
Despite the substantial modification, the corridor still offers important ecological values including habitat for threatened fauna (Pink-tailed Worm Lizard). There is significant scope to maintain and improve the ecological values of the study area. This approach would have benefits for the biodiversity and amenity of the immediate area and surrounds.

5.1.1 Bush regeneration management zones

A staged approach undertaken by a team of professional bush regenerators is recommended in the strategic action plan for biodiversity. **Figure 11** identifies three management zones within the study area that relate to the stages of implementation. Further definition of these according to their suitability for recreation, fire management, habitat protection etc should be undertaken during preparation of the Concept Plan and Plan of Management. Detailed investigation will also be used to refine the extent of each zone, the tasks to be undertaken and the priorities/work schedule.

Zone 1 – is the area in ‘best’ ecological condition and incorporates Pink-tailed Worm Lizard habitat. This zone should be managed first by removing stock, woody weeds and highly invasive weeds (e.g. African Love-grass, St John’s Wort and Chilean Needle Grass), and stabilising erosion. Fences, signage and access paths should be constructed to protect habitat areas from inappropriate use. Longer term management in this area should focus on increasing the proportion of native species consistent with the vegetation communities mapped in **Figure 12** and described in **Section 5.1.6**. Priority should be given to involving the community in management of this area because it offers relatively easy access, the work would not be too arduous and results would be quick to occur.

Zone 2 and **Zone 3** – these zones are heavily weed infested, particularly along the river banks. Indicative areas for these zones are shown in **Figure 11**. The alternate management pattern is intended to allow fauna species to move to adjacent habitat as primary weed control is undertaken and then revegetation/regeneration of native species occurs. The risk of soil erosion would also be reduced by this staged approach. Community involvement in the management of these zones should be encouraged once the maintenance stage is reached.



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Figure 11: Biodiversity strategic action plan