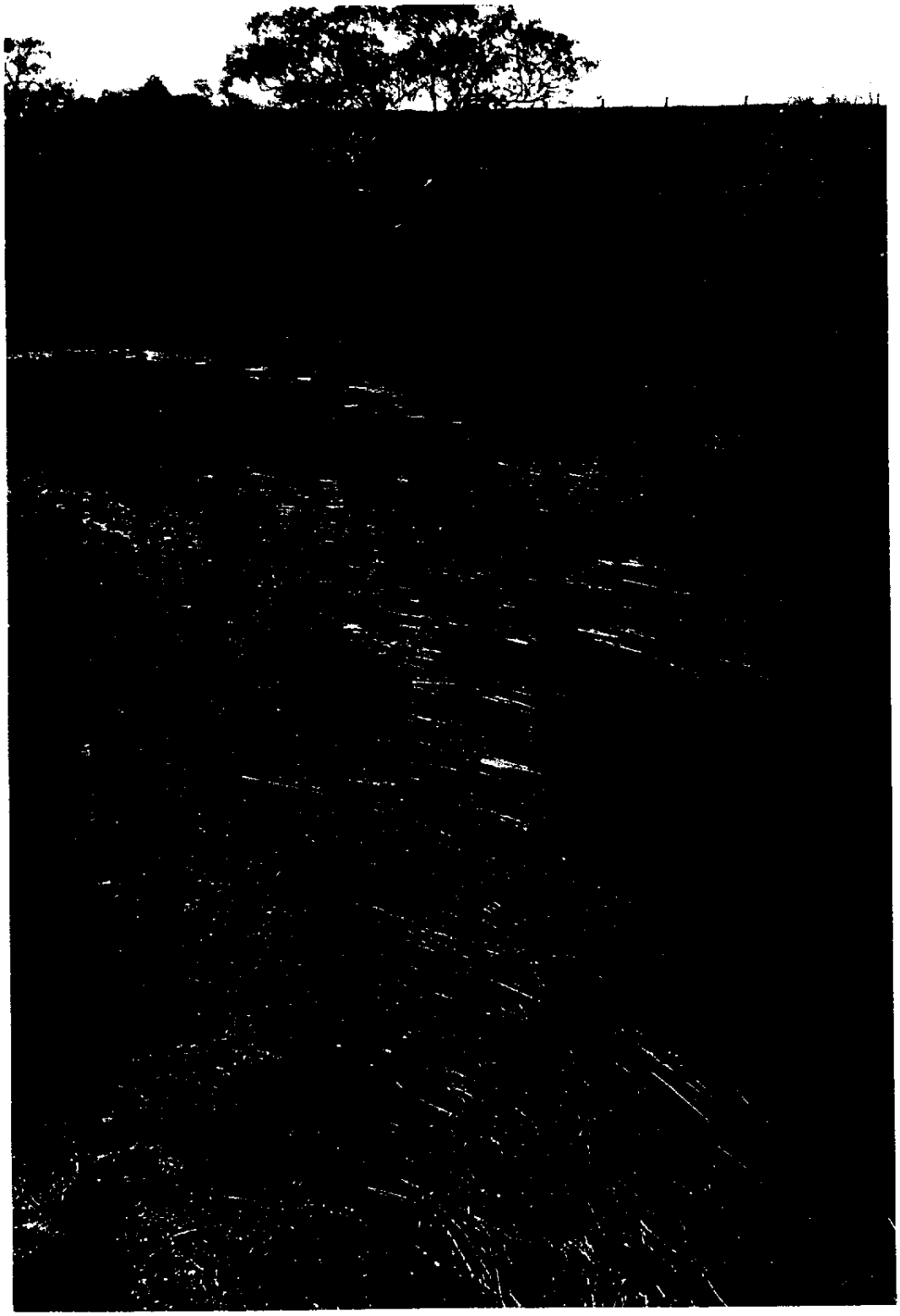
Merri Creek and Environs Strategy



Merri Creek and Environs Strategy Steering Committee

1999

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Strategy Steering Committee
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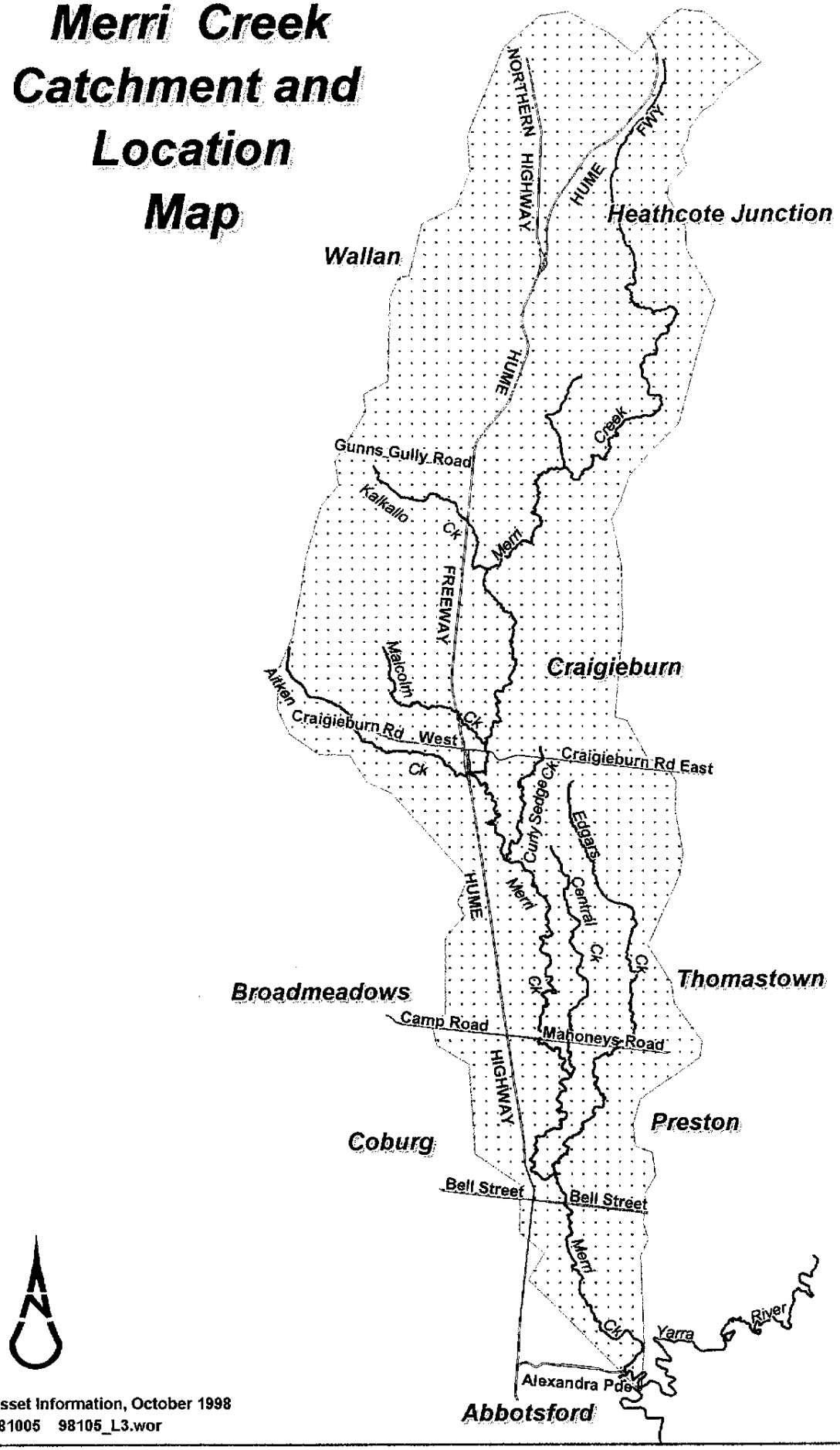
Cover Photo
Merri Creek at Summerhill Road, Craigieburn/Wollert - taken from bridge looking north

Merri Creek Catchment and Location Map



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List of Abbreviations and Table Symbols

The following provides an explanation of symbols and abbreviations used throughout this report.

List of Abbreviations

AAL	Aborigines Advancement League
AAV	Aboriginal Affairs Victoria
AAVHSB	Aboriginal Affairs Victoria, Heritage Services Branch
APC	Australian Platypus Conservancy
BOD	Biological Oxygen Demand
BUG	Bicycle Users Group
CALP	Catchment and Land Protection (refers to Board)
CERES	Centre for Research in Environmental Strategies
CRC	Cooperative Research Centre
DCE	Department of Conservation and Environment (formerly – now DNRE)
DCFL	Department of Conservation, Forests and Lands (formerly – now DNRE)
DNRE	Department of Natural Resources & Environment
DI	Department of Infrastructure
EPA	Environment Protection Authority
FAM	Free Advertising Material
FOMC	Friends of Merri Creek Inc.
ICOMOS	International Convention on Monuments of Significance
KNCHO	Kulin Nation Cultural Heritage Organisation
LGA	Local Government Authority
MAV	Municipal Association of Victoria
MCCC	Merri Creek Coordinating Committee (1976-1990 – replaced by MCMC)
MCMC	Merri Creek Management Committee Inc.
MMBW	Melbourne Metropolitan Board of Works (formerly – now Melbourne Water)
MPW	Melbourne Parks and Waterways (now Parks Victoria)
MW	Melbourne Water
NESB	Non-English Speaking Background
NGOs	Non-Government Organisations
PAMA	Public Authorities Management Agreement
PIRG	Public Interest Research Group
PV	Parks Victoria
SA	Statutory Authority
SEPP	State Environment Protection Policy
VicRoads	Victorian Roads Corporation
VNPA	Victorian National Parks Association
TNV	Trust for Nature (Victoria)
WTLCCHC	Wurundjeri Tribe Land Compensation and Cultural Heritage Council

Table Symbols and Terms

MCMC Coord'n Req'd	Merri Creek Management Committee Coordination Required. The Steering Committee has agreed that MCMC should play a coordination role in assisting implementation of the action.
Accountable SA or LGA	Funding agency having accountability for the action. That body may delegate delivery of the action to a contract provider.
$	Up to $10,000
$$	$10,000 +
$$$	$100,000+
High	1-2 Years – as determined by Steering Committee. See note top of each table.
Medium	2-5 Years – as determined by Steering Committee. See note top of each table.
Low	5-10 Years – as determined by Steering Committee. See note top of each table.

Executive Summary

The Merri Creek and Environs Strategy is a document intended to give direction to management needs for the Merri Creek corridor. While the title indicates it has a strategic intent, it also captures some important, often site-specific actions, which underpin its strategic direction.

The **Introduction** further outlines the purpose and nature of the Strategy and sets out a vision statement and goals for the creek corridor. The Introduction is completed with an overview of the roles and responsibilities of agencies and stakeholders along the corridor.

The Strategy then moves into consideration of issues under its four parts - land, water, community and management.

Part A - Land

Section 1 examines issues concerning Aboriginal and European heritage and the visual character of the corridor.

The twenty-three actions under **section 1.1** (Aboriginal Heritage), include a range of recommendations to provide for protection of identified sites of archaeological significance and to protect those sites not yet surveyed, but having a likelihood of possessing evidence of Aboriginal settlement or occupation.

Section 1.2 looks at European heritage and contains seven actions to manage and protect sites of known significance. Based on earlier work by Johnston and Ellender (1993), some ten sites are named as being appropriate for nomination to the Register of the National Estate.

Section 1.3 examines the visual character of the corridor. Its fourteen identified actions include many which will seek to ameliorate intrusive visual characteristics of nearby land use. Powerlines, drain outfalls, rubbish dumping, road crossings, signs and the built environment are all identified as elements which can detract from the visual character of the stream corridor.

Section 2 of Part A considers the flora, fauna and open space attributes of Merri Creek and its tributaries. These issues are examined according to three broad reaches of the stream - the headwaters to Craigieburn; Craigieburn to Mahoneys Road; and Mahoneys Road to the Yarra River.

Section 2.1 outlines some of the key natural features of the headwaters reach including: the now drained Hernes Swamp; Camoola Swamp; the Bald Hill grassland; the Kalkallo to Craigieburn section of the stream, (including the Summerhill Road area where Platypus was last seen on Merri Creek); and the Mickelham-Mt. Ridley grassland site to the west of the middle catchment. The thirteen recommended actions include: establishment of a working group to determine planning and other mechanisms for identification and protection of significant sites; a feasibility study of Hernes Swamp to examine if it can be returned to a more natural marshy herbfield condition; continuation of negotiations regarding a management plan for the Bald Hill grassland; and promotion of Landcare, Land for Wildlife and the investigation of rate incentives to encourage better management of private lands with significant flora and fauna.

Section 2.2 examines the creek corridor downstream of Craigieburn. This reach possesses some significant grassland remnants including the nationally significant Craigieburn grassland.

The seven route options for the proposed Hume Freeway, currently under consideration by a Ministerial Advisory Committee, are also described.

Apart from the Craigieburn grassland, also described within this reach are: the Cooper Street grassland; the Barry Road to Horne Street sub-reach including Galada Tamboore (formerly the Campbellfield Retarding Basin); Horne Street to Mahoneys Road; and the Edgars Creek headwaters. The recommended actions of this section include many to preserve and expand opportunities for open space provision, flora and fauna conservation and habitat links between sites.

Section 2.3 deals with the urbanised section of the creek corridor south of Mahoneys Road. It provides argument for the development of Primary and Secondary Node Plans at sixteen sites. Node Plans will require local government cooperation to address open space improvement and management across municipal areas within discrete sub-reaches nominated for such plans.

There is also a recommended action to resolve land ownership and other issues associated with a number of sites so that access can be provided and improvement to open space qualities obtained at nominated sites. The section also contains a recommendation to prepare an Open Space Development Guidelines Manual so that open space

development and revegetation might be guided to produce more consistent outcomes.

Part B - Water

Part B of the Strategy deals with water related issues, with **Section 3.1** examining issues related to waterway, drainage and flood management. The eight actions of this section are directed mainly to Melbourne Water and require it to maintain adequate stream stability, and trial habitat and morphology restoration treatments to re-establish the pool and run formation of the stream. It is also recommended that Councils and Melbourne Water control development within the 1% flood zone and use various means to manage and reduce runoff.

Section 3.2 is entitled water quality and in part it examines the various assessments of the stream's waters carried out over recent years. It further examines the particular problems of urban stormwater and the limited opportunities available to improve water quality emanating from urban environments. There is also discussion of the special problem of litter and an overview of various recent studies of the issue in the Merri catchment. A litter policy for the catchment is recommended, along with establishment by Melbourne Water of wetlands in retarding basins where opportunities are available and likely to be cost-effective.

One of the more far-reaching of the twenty actions from this section recommends that Councils develop stormwater management plans to audit the local drainage infrastructure and develop measures to address the management of water quality, as well as quantity.

Section 3.3 provides an overview of the waterway ecosystem of Merri Creek. It outlines the conditions required for stream health and the factors which have caused decline in the diversity of the Merri's ecosystem. The thirteen actions recommend a variety of further research efforts to investigate stream condition and trial measures to re-establish habitat for depleted species and assess opportunities to construct fish ladders at barrier points such as Coburg and Edwardes Lakes.

Part C - Community

Section 4.1 deals with recreation and has ten recommended actions to improve access to open space along the corridor as well as increasing the diversity of recreation opportunities for the community. The actions seek to encourage the provision of recreation programs and other events which attract users to the creek corridor's open space.

Section 4.2 examines the matter of trails and access. It has twenty recommended actions which identify a host of improvements to the Merri Path and its connection to other trail systems.

Public Safety comes under examination in **Section 4.3**. The focus of recommendations here is to take a variety of steps to address concern over problems experienced by users of the Merri Creek Parklands and to put in place preventative measures to reduce user risk.

Section 4.4 looks at how community involvement and education might be continued. The actions call for support for the operation of a Friends of Merri Creek as well as the development of smaller local groups to take an interest in local open space development. The actions also include some to develop programs for non-english speaking background and other target groups.

Part D - Management

This part of the Strategy deals with issues of planning and management coordination.

Section 5.1 looks at planning issues and contains ten recommendations for action in relation to: inclusion of reference to the Strategy within Planning Schemes and the development of a local policy for Merri Creek; development of appropriate overlay controls; the use of a Development Guidelines for the Merri Creek document; preparation of Developer Guidelines for industrial areas between Hume Highway and Merri Creek from Craigieburn to Campbellfield; and completion of the revision of the Merri Creek Plan (1987).

Section 5.2 traces the evolution of management coordination for Merri Creek and the development of the Merri Creek Management Committee (MCMC). It further details the roles and responsibilities of agencies and stakeholders and contains six actions to continue coordination between these parties.

Section 6.1 deals with issues associated with implementation of the Strategy. There is a call for preparation of three year priority activity plans to assist implementation of Strategy actions by major stakeholders and so that budget bids might be prepared accordingly.

Section 6.2 examines the issue of monitoring and review. The action recommends biennial monitoring and review meetings of stakeholders to receive reports on implementation, amend actions and make new recommendations as agreed between stakeholders.

Introduction

Origins, Purpose and Nature of the Strategy

Origins

This Strategy has evolved from a review of the Merri Creek Concept Plan Final Draft (Melbourne Parks and Waterways and Merri Creek Management Committee, 1994).

Melbourne Water facilitated the review and established a Steering Committee of stakeholders to guide and assist the process. Following agreement from the Steering Committee on the Strategy's contents, the document was approved by all Councils and other agencies in late 1998.

The Steering Committee further agreed that, as Concept Plans were no longer being produced for waterways, it was appropriate to re-name the document to better reflect its intent. Hence the change of title from Concept Plan to Strategy.

Purpose

The essential purpose of the Strategy is to provide an overview of important issues along the Merri Creek corridor and document agreed actions to achieve their resolution. The Strategy's further purpose is to facilitate coordinated action by responsible agencies.

The underlying assumption of the Strategy is that such coordinated action will ultimately enable protection and rehabilitation of the stream corridor.

In addition, as the community sector is recognised as an important support player in stream corridor protection, the Strategy is intended to help articulate community expectations and needs which have increasingly been shaped and expressed over the last twenty-five years.

Nature

The document is intended to operate as a useful planning tool with relevance for at least the next five to ten years. The Strategy should be treated as a device providing agencies with a coordinated and principled planning framework to tackle implementation of actions along the stream corridor. It is an implementation aid which will assist responsible parties to address issues and actions for which they are accountable.

In further describing the nature of the document, it is important to understand the niche which it occupies amongst documents of its type. On the one hand, the Strategy is not a high level strategy devoid of reference to specific issues in particular locations. These plans tend to beg the creation of a set of further plans to fill in the detail of the key strategy areas. Yet neither is the Strategy at the other end of the spectrum. It is not a detailed, reach-by-reach plan exhaustively examining issues and actions for discrete sections of the waterway corridor.

Instead, the Strategy provides for the establishment of a principled approach to addressing key issues with recommendations for broad actions of a strategic nature to resolve issues. In addition, where possible, it tags a specific local action to the principle or strategy, in order to help define or achieve appropriate targeting of the action.

Given this approach, and in order to ensure the Strategy's on-going relevance, it has been seen as important to achieve a high degree of agreement and consequent accountability for nominated actions within the Strategy. To this end action tables have been developed at the end of each chapter. These tables give an overview of the likely rounded notional costs of implementation of actions by all responsible parties and the priority attached to actions by the steering committee for the Strategy.

The document is thus intended to provide a planning framework from which each accountable organisation is more easily able to develop their own three year works plans and programs for implementation of actions.

Merri Creek - An Overview

Merri Creek and Its Catchment

The main stem of Merri Creek rises in the foothills of the Great Dividing Range around Heathcote Junction. It joins its western arm, which rises north of Wallan, to flow some sixty kilometres south to its junction with the Yarra River at Dights Falls in Abbotsford. It is one of the Yarra's major tributaries draining water from a catchment covering some 396 square kilometres.

The catchment consists of seven major tributary systems including Aitken and Malcolm Creeks which drain the expanding township of Craigieburn, and Merlynston, Central and Edgars Creeks which flow through established urban areas. (see Catchment and Location Map, p. 3).

The catchment is predominantly rural, especially in its middle to upper reaches with the small townships of Wallan, Beveridge and Kalkallo located near the creek. Further south on the urban fringe is Craigieburn and the expanding northern suburbs of Melbourne.

Land Use, Human Impacts, Demographics and Recreation Opportunities

Land uses along the course of Merri Creek change from pastoral to industrial and urban/residential. Issues affecting the creek reflect this changing pattern of land use.

Like many tributaries of the Yarra River, Merri Creek contributes significant sediment, nutrient and litter loads to inner Melbourne and ultimately to Port Phillip Bay from its rural and urban sub-catchments.

Within the Merri Creek catchment a high proportion of the population belong to non-english speaking background communities. In addition, the outer suburbs are projected to experience further growth in the foreseeable future. For instance, within the Whittlesea municipality, population is expected to increase by another 74,000 to 181,215 people by 2021 (Department of Infrastructure, 1997). In Hume, population is increasing at a rate of 1.9% per annum. It is anticipated that by 2011, there will be a further 35,399 people living in Hume beyond the municipality's current population of 121,273 (Hume City Council, Draft Planning Scheme, 1997). Urban growth in these two municipalities within the Merri Creek catchment will be focussed on the Epping North area in Whittlesea (effecting the Edgars Creek catchment) and the Craigieburn to Mt. Ridley area (directly effecting the Malcolm Creek catchment particularly).

Merri Creek and its immediate surrounds are also an important resource with many natural values and recreation opportunities for nearby communities. Recreation needs studies of the last two decades have identified a clear community preference for more recreation opportunities within informal passive open space. Such a recreational resource can be provided along the stream corridor.

The lands of the Merri Creek corridor provide a link to the outer suburbs and a potentially diverse range of recreational and open space features with the existing open space and trail system being a valuable component of the metropolitan wide network. Merri Creek provides links to Yarra Bend Park and the Yarra River trails, to the adjacent catchments of Moonee Ponds Creek and Darebin Creek and to the Inner Circle trail and the Metropolitan Ring Road trail.

In its lower reaches Merri Creek flows through urbanised suburbs many with comparatively poor open space provision. The creek corridor provides an opportunity for such suburbs to improve their quantity and quality of open space.

There are many opportunities and benefits to the community to be gained from ongoing development of the Merri Creek Parklands as an open space corridor. It has the potential to:

- form a key element in a 'greening' of the northern suburbs;
- provide a city to country open space link;
- offer a source of healthy recreation;
- provide an educational asset for the community; and
- function as a habitat corridor.

Vision for the Merri Creek Corridor

To achieve a healthy living stream flowing through an attractive environment which provides habitat for native animals and is valued by the community as a peaceful, passive open space haven. To protect the natural and cultural features of the Merri Creek corridor through sensitive management which will provide a lasting benefit for the community.

Goals for the Merri Creek Corridor

Land

- An expanded, protected, restored and revegetated Merri Creek Parklands to deliver re-established indigenous vegetation communities with sustainable flora and fauna habitats.
- The use and appreciation of the Merri Creek Parklands and their promotion as a community recreation asset.
- An effective and, if possible, continuous habitat corridor from the headwaters of Merri Creek to the Yarra River.
- Protection of significant biological values between Craigieburn Road East and Mahoneys Road.
- A continuous off-road trail from Craigieburn to the Yarra River, avoiding significant flora and fauna sites and with links to the metropolitan trail network and nearby open space.
- Provision of access points from adjacent areas to the trail and the stream corridor.
- Protection, conservation and enhancement of sites of Aboriginal and European cultural heritage value.
- Protection and enhancement of the visual amenity of the Merri Creek Parklands.

Water

- Protected and improved stream water quality and reduced litter providing a sustainable waterway ecosystem which maximises opportunities for habitat, recreation and amenity.
- Creation of a healthy and sustainable stream environment with extensive natural habitat and biological diversity.
- Protection of adjacent properties from a 1 in 100 year flood event through protection of floodplains, appropriate siting and design of development, and environmentally sensitive flood protection measures.

Community

- Continued support and fostering of community involvement in: policy development and decision making; management forums; and participation activities.
- Encouragement of community pride and interest in the Merri Creek Parklands.
- Provision of opportunities for participation by the Wurundjeri community in all matters associated with Aboriginal cultural heritage.
- Involvement and participation opportunities extended to non-english speaking background communities in recognition of the multi-cultural nature of the region.
- Provision of passive recreation, education and information facilities and programs consistent with good management of the Merri Creek Parklands.

Management

- Achievement of effective management coordination between funding stakeholders through management coordination structures encompassing the following objectives:
  - recognition of the separate roles and responsibilities of stakeholders;
  - inclusion of all stakeholders in forums where views can be aired before those with the management responsibility;
  - preparedness to work towards common and shared goals as set out in this Strategy;
  - preparedness to adopt a flexible and responsive approach to:
    - the requirements and impacts of organisational and legislative change;
    - delivery of waterway and land management improvement; and
    - contributions from, and involvement of, the community sector.
  - preparedness to recognise catchment generated effects on the waterways of the Merri system and to address them in line with CALP requirements;
  - ability to develop and implement policy and programs through the use of human resources and staff with required expertise in waterway, open space and land management;
  - effective use of additional external funding to add value to member organisation contributions;

- development of procedures for the operation of management coordination committees to ensure they operate in an effective, democratic and accountable manner in meeting their objectives and the purposes of their stakeholders;

- clear understanding of accountabilities and degree of delegation and roles and objectives between member organisations and staff.

- Best use of resources provided by funding stakeholders.

- Inclusion of the community sector in management coordination structures.

- Regular reviews of management coordination structures and mechanisms to:
  - ensure their continuing relevance to contemporary circumstances;
  - provide an important and necessary accountability tool; and
  - provide a formal means for advising funding stakeholders of the progress of particular structures.

- Support for private landholders participating in cooperative stream management programs.

Agency Roles and Responsibilities

There are a number of factors which make for a diversity of agency roles in relation to waterways and their environs. A primary one is land ownership.

Land Ownership

Along Merri Creek there are a host of different land owners holding properties adjacent to the stream - private individuals and companies, Councils, the Crown, Melbourne Water, Parks Victoria, VicRoads, GPU PowerNet and the Public Transport Corporation are the main ones. As separate private and public entities each has different purposes and objectives in relation to that land. While most land owners would be sympathetic to environmentally sensitive management of the creek corridor, some would not see it as a primary concern in management of their land. This can occasionally provide for situations of conflict. It is therefore important to recognise that it is the issue of land ownership which is often critical to determining the exercising of management responsibilities along waterway corridors.

Watercourse and Open Space Management Responsibilities

There are a number of agencies with management functions for waterway corridors throughout the Port Phillip and Western Port catchment. Councils and Melbourne Water are two principal players. Each have separate and distinct responsibilities in relation to the management of waterway-related assets. It needs to be emphasised that there are no longer overlapping purposes and responsibilities between state and local government agencies, most particularly in the area of open space management and provision. Melbourne Water's responsibilities are in the areas of: management of the watercourse and the immediate stream environment; and management of land it holds along the stream or manages as an urban floodway zone (due to its reservation as such at the time of subdivision).

Councils by contrast have responsibilities for: management of lands owned by Council; delegated management of areas of Crown land; and management by negotiation with Melbourne Water of the stream frontage where a local arrangement might facilitate achievement of a mutually desirable objective, eg. grass cutting.

Although a player in stormwater management through control of the local drainage system, Councils have no role in relation to management of the watercourse itself.

Trail Management

Councils also have a major responsibility for the provision and on-going management of trails along waterway corridors. While these trails have often been constructed to meet a regional trail development need and have been constructed through funding made available from sources external to Council, their on-going maintenance is a matter solely for Councils.

Other Roles and Responsibilities of Local Government and Key State Agencies

(i) Melbourne Water

Melbourne Water is required to deliver:

- waterway, drainage, floodplain and riparian zone management, including protection and enhancement of flora, fauna and habitat values within the floodplain; and
- flood protection and flood warning services.

Melbourne Water also facilitates:

- water quality protection and improvement works;

- the monitoring and reporting of the performance of stormwater managers and the state of water environments;
- identification of best practice and the setting of standards and targets for stormwater management;
- the funding of research to identify best practice for stormwater management and the development of new technology; and
- waterway recreation setting provision so others can develop waterway recreation facilities.

(ii) Local Government

Councils now have the principal responsibility for open space and amenity provision and development, especially on lands which they own.

Open space along waterways is also important for local government in terms of recreation provision.

Councils also have a key role to play in the management of local drainage through construction and maintenance of drains which feed into the Melbourne Water regional system.

A further critical function Councils perform is associated with their administration of planning schemes. Within this role Councils can influence planning requirements to assist in stormwater quantity management and the protection of water quality of receiving bodies (see further section 3.1 and 3.2). There is also scope to influence the visual character of developments within the viewshed of the waterway and to require landscaping and screening vegetation to protect waterway amenity.

(iii) Department of Natural Resources and Environment (DNRE)

DNRE has a diverse range of roles in relation to waterways. It plays a role in management of environmental flows, oversees bulk water entitlements and is a support agency in the area of aquatic and freshwater ecology and instream habitats. It is the key fisheries manager and this function sits within its flora, fauna and fisheries monitoring and management functions.

DNRE has responsibility for the implementation of the CALP legislation throughout the State. This work is performed in its Catchment and Land Management area. DNRE also assists the work of the CALP Council and regional Boards.

A further role of DNRE is to provide advice to land managers generally (including Parks Victoria), about the management of sites with flora and fauna significance. DNRE is also involved in providing for the protection of sites and in some cases this may involve acquisition.

Once key conservation sites have been secured, DNRE has a further role in recommending the nature and scope of their management to "provider" organisations such as Parks Victoria.

(iv) Parks Victoria

Parks Victoria has responsibilities for delivery of management works on regionally significant park and reserve sites. Along Merri Creek, Parks Victoria currently manages the 23 hectare Cooper Street grassland reserve. It also owns areas of native grassland at Jukes Road in Fawkner and, with other land owners, part of a site adjacent to Central Creek in Reservoir.

Parks Victoria is also able to support Council initiatives for development of regional trails and open space areas through their grants program.

Other State Government Agencies and Utility Companies

VicRoads have an interest in the Merri Creek corridor due to their ownership of parcels of land for future road construction. Their predominant current interest is the F2 Freeway reservation from Craigieburn to the Western Ring Road. VicRoads have also been involved in planning road crossings of Merri Creek, most recently in the Fawkner-Reservoir area.

The Public Transport Corporation conducts some land maintenance activities associated with rail reserves adjacent to the waterway corridor (eg. near Rushall Station).

A number of electrical utilities (eg. GPU PowerNet, Citipower and Solaris Power) have transmission line assets within the creek corridor. The most significant of these is the high voltage transmission line between Thomastown and Brunswick Terminal Stations and its extension via an underground cable along the creek valley to Queens Parade Clifton Hill, before ultimately connecting to the Richmond Terminal Station. GPU PowerNet have responsibilities to maintain their easements to provide for safe and secure power supply.

Sewer lines and high pressure gas pipelines are also located within various parts of the creek corridor.

The Environment Protection Agency (EPA) has a role as a regulator in relation to the water quality of Merri Creek. The EPA oversees requirements for water quality as set out under the State Environment Protection Policy (SEPP) for the Waters of the Yarra Catchment.

Yarra Valley Water's role in relation to Merri Creek is mainly in relation to the management of the Craigieburn Sewerage Treatment Plant. The discharging of waters from the Treatment Plant is regulated by the EPA.

Current Roles and Responsibilities of MCMC

The MCMC is an incorporated association whose current members are:

- the municipalities of Darebin, Hume, Moreland, Whittlesea and Yarra;
- Melbourne Water; and
- Friends of Merri Creek.

Representatives of its members form a Committee of Management which meets regularly to discuss policy and issues, oversee MCMC's operations, and to coordinate management.

As an incorporated association the MCMC is required to act in accordance with its Statement of Purposes. MCMC's primary purpose is to ensure the preservation, restoration, environmental protection and ecologically sensitive development and maintenance of the Merri Creek and adjoining catchment areas, with a long term aim of securing a major regional park ("the Merri Creek Parklands") with significant recreation and conservation value.

The MCMC's Statement of Purposes also includes the following:

- Land use planning - to develop and monitor a Merri Creek Concept Plan, to monitor planning controls and activities, and to continue to develop the Merri Creek parklands as a linear park.
- Catchment planning - to maintain an interest and to comment when requested on land use planning issues in the catchment of the Merri Creek.
- Creek Parkland Management - including policy development, ensuring environmentally sensitive maintenance and development of the Merri Creek Parklands, and employing a dedicated works crew to establish and regenerate indigenous vegetation and restore the landscape of the Merri Creek and adjoining lands.
- Resource management - optimising the use of scarce resources for efficient maintenance and development of the Merri Creek and to seek additional external funding.
- Regional approach - to promote and conduct programs and activities to achieve integrated catchment and parkland management, community education, resource sharing and information exchange on a regional basis involving key stakeholders. To assist other organisations to achieve sustainable environmental development of the Merri Creek and adjacent catchments and the wider metropolitan area.
- Community participation, community awareness and support for Friends of Merri Creek.

MCMC has no formal controls over the Merri Creek or adjacent lands and owns no land along the Creek, however it adds value to the endeavours of its member organisations. One of the reasons it was set up was to assist other organisations with delegated delivery of their primary accountabilities.

MCMC's key activities include: revegetation and restoration of remnant vegetation; community education and water quality monitoring activities (particularly in schools); and environmental, strategic and statutory planning advice. The MCMC has developed a significant knowledge base in relation to the Merri Creek corridor and its issues.

PART A - LAND

SECTION 1 - Heritage and Visual Character

1.1 Aboriginal Heritage

Introduction

Survey work along Merri Creek over the last decade has revealed a rich Aboriginal heritage associated with the stream. The consultants' studies for the preparation of the Merri Creek Concept Plan Final Draft (MPW & MCMC, 1994) and other surveys before and since, have identified a large number of known sites. In addition, these surveys have also identified areas of sensitivity where many other, as yet unknown sites, are likely to occur. Surveys now span the Merri Creek corridor from Hernes Swamp at Wallan to the stream's confluence with the Yarra River at Abbotsford.

Background

Aboriginal Habitation

The northern region of Melbourne is the traditional land of the Wurundjeri willam people, a clan of the Woiwurrung language group (Barwick, 1984 in Ellender, 1993). While descendants of the Wurundjeri willam live in communities in Dandenong and Healesville and their councils have authority over archaeological sites within lands defined by federal legislation, comparatively little is know of their occupation of the lands before and at the time of European contact. Their land was rapidly overrun by the onset of European settlement and there were few qualified observers to record details of their society. In any case it was dramatically altered by the impacts of European occupation.

Perhaps one of the best known sources of contact between Europeans and Aboriginal people was William Thomas, Assistant Protector of Aborigines from 1839, who camped on the Merri Creek in the 1840s and subsequently lived there. The Melbourne Baptist Congregation, with the help of Thomas, established the Merri Creek Aboriginal school on the peninsula of land between the Merri and the Yarra River, now covered by the Eastern Freeway (Hall, 1989). Although the school was apparently established with Woiwurrung support initially, parents later withdrew their children forcing its abandonment (Johnson and Ellender, 1993, vol. 2).

Previous Studies

Prior to the 1980s, Merri Creek was only subject to sporadic discoveries of Aboriginal sites. One of the earliest discoveries was by Brough Smyth in 1887 of a mound site at Donnybrook (in Ellender, 1997b). Further early records were a scatter of artefacts at the Merri/Yarra confluence discovered by Hardy in 1911, and a freshwater mussel midden and artefacts near Pentridge Prison at Coburg discovered by Hanks in 1933, (Ellender, 1997b).

Contemporary Studies

Since the late 1980s, there have been a number of archaeological studies of Merri Creek. Presland's 1983 survey of the Melbourne area identified the Merri Creek locality as having potential for archaeological significance due to the likelihood of its use by Aboriginal people (Presland, 1983). This was subsequently confirmed through work commissioned by the Merri Creek Bicentennial Committee (Hall, 1989). On the basis of these and other studies, there is strong evidence that the Merri Creek and surrounding lands were important for food, shelter, travel and maintaining cultural traditions for Aboriginal people.

Hall's work was one of the first regional surveys to be carried out in the Melbourne area. In relation to Aboriginal archaeology, Hall found 21 lithic scatters (stone artefacts) and 5 scarred trees to which he assigned a 'high regional cultural significance and at least a medium regional scientific significance' (Hall, 1989).

Hall further indicated that the area north of Mahoneys Road where the land is unmodified should be considered as archaeologically sensitive. Only a small part of these lands were effectively surveyed during his study, these being mainly at the Merri Gorge (now Galada Tamboore) and a few other sites. This was due to visibility conditions or lack of bare ground. Hall recommended that all sites surveyed should have protection through legislation and be preserved due to their research potential and cultural significance.

Ellender's background study for the 1994 Merri Creek Concept Plan Final Draft, (Johnson and Ellender, 1993), comprised far less survey work than that conducted by Hall. Instead a major focus of the work was on preparing recommendations for protection of sites and identifying gaps in knowledge requiring further survey work. Some of this additional work has now been completed with the undertaking of surveys between Hermes Swamp and Craigieburn (Ellender, 1997b).

Ellender's 1993 report made recommendations pertaining to seven specific sites from Craigieburn Road to Central Creek. These mainly involved preventing disturbance and erosion, and seeking revegetation for protection of the site and its values. A further three recommendations were made for areas of archaeological sensitivity.

Ellender's 1997 study made twenty-one recommendations about protection of sites, education to engender better levels of community understanding of aboriginal heritage issues and future projects for consideration and funding. This most recent survey work (carried out in mid-1994), has brought to over sixty the number of Aboriginal sites from Hermes Swamp to the Merri Creek's confluence with the Yarra River (Ellender, 1997b). There are more than 40 registered artefacts scatters, exposures in the creek bank and similar sites, while there are 20 scarred trees now recorded in the area upstream of Mahoneys Road (ibid, p. 38). An assessment was also made of the health of the scarred trees, all of which are likely to be over 200 years old. 73% were found to be in poor health and 13% already dead (ibid, p. 45) - although dead trees still enjoy legal protection.

Besides documenting the archaeological resources of the middle and upper Merri, Ellender's study also investigated the Merri/Yarra confluence to attempt to discover remains of William Thomas' house/Protectorate Station and the Merri Merri Aboriginal School near Dight's Mill. An attempt was also made to confirm the mound site at Donnybrook recorded in 1878. Attempts to reaffirm these important sites were unsuccessful.

During the period of Ellender's study an application was forwarded to the Register of the National Estate nominating historic and archaeological Aboriginal sites on Merri Creek for registration.

A further archaeological study of recent times applicable to the catchment is that by du Cros and Associates of the Craigieburn area and particularly Malcolm and Aitken Creeks. The study identified both streams as having a zone of archaeological sensitivity on either side for a distance of 50 metres (du Cros and Associates, 1991 in Ellender, 1997b, p. 31).

There has also been a recent study of a 700 metre section of Edgars Creek between the Kodak bridge and the confluence of Edgars and Merri Creeks (Lane, 1996). This report was prepared for Melbourne Water as part of its investigation for site works in the vicinity. The survey recorded seven isolated artefacts which were assessed as having low scientific significance (ibid, p. 13).

Issues

- The protection provided under State and Federal legislation to all Aboriginal sites has not been effectively linked to the planning permit system for land development and change of use. The result is that the protection of known and yet to be identified sites is currently inadequate.

- Where many sites, especially in the upper and middle catchment, are on private property, information dissemination to landowners and development of appropriate management practices for protection of archaeological sites becomes critical.

- Areas of archaeological sensitivity along Merri Creek are subject to a number of threatening processes caused by inadequate, or inappropriate management, or simple ignorance of their values. Still others are under threat due to development planned for the future. In some cases this may mean that archaeological sites are lost even before they have been surveyed.

- Aboriginal sites are fragile and non-renewable, and known sites might only be a fraction of those which could be found to exist with future investigation.

- The precise location of identified Aboriginal sites should not be made publicly known without the consent of the Wurundjeri Tribe Land Compensation and Cultural Heritage Council (WTLCCHC).

- Many of the upper tributaries of Merri Creek have not been adequately surveyed for cultural and historic sites, while lower tributaries have been partially surveyed.

- Agency staff need better training and procedures to effectively fulfil their obligations under cultural heritage legislation and to the community.

Objectives

- Protection of all significant Aboriginal cultural and heritage sites within Merri Creek corridor through such measures as application of: relevant Federal and State legislation; local government planning schemes; landowner agreements; and sympathetic land management.
- Provision of notification and information to all land managers, both public and private, regarding the general location of significant sites and their responsibilities for protection and management.
- Continued identification and conservation of sites of archaeological and Aboriginal cultural heritage significance.
- Involvement of appropriate bodies such as the WTLCCHC and/or the Kulin Nation Cultural Heritage Organisation (KNCHO) in management and interpretation of Aboriginal cultural sites and the recording of knowledge of Aboriginal history, both written and verbal.
- Assessment and management of sites of cultural heritage significance in accordance with the Australian ICOMOS Charter for the Conservation of Places of Cultural Significance (the Burra Charter), 1981.
- Interpretation of sites of significance within a context of ensuring their management and protection.

Action Program **Note:** * in accountable SA (Statutory Authority) or LGA (Local Government Authority) column = MCMC assigned responsibility for delivery of the action by that Council and P = partnership arrangement for delivery, usually between LGA and MCMC. Overall Notional Cost = combined notional cost of action for accountable parties. N/A = column heading is not applicable. Priority = the agreed priority attached to the action by the steering committee for the Strategy, which may differ from individual agency's timeframes for commencement of implementation of the action due to an agency's budgetary processes.

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
AH1	Develop a consistent regional approach to waterway archaeological issues across relevant Councils including investigation into the application of Council Planning Scheme controls as one possible means of achieving protection of archaeological sites.	Hume, Whittlesea, Moreland, Darebin	MCMC, MW, AAVHSB, WTLCCHC		N/A	High
AH2	Ensure Councils consider the following at the time of planning applications for proposals affecting the Merri Creek system: • no ground disturbance be conducted in areas of high sensitivity for ground sites and where ground disturbance is unavoidable - the Registrar at AAVHSB to be contacted for advice; • no pruning or cutting down of indigenous trees (especially scar trees) be permitted prior to inspection by a person qualified to identify an Aboriginal scar; • scarred indigenous trees retain a buffer zone around perimeter twice the canopy diameter within which no works and services should take place other than vegetation maintenance;	Whittlesea, Hume, Moreland, MW	MCMC, AAVHSB, WTLCCHC	✓	N/A	High

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority

AH2 cont'd	• archaeological assessment be conducted prior to ground disturbance, or change of land use;
	• exact locations of registered archaeological sites should not be made public except:
	  • where a site has been declared a Heritage Place;
	  • its location is within an allotment; or
	  • where it may be divulged to the landowner for a specific reason (eg. to better protect site) and where permission has been obtained from the WTLCCHC					

AH3	Ensure areas of archaeological sensitivity (as denoted on the 1:5000 maps from Johnston and Ellender 1993, and/or Ellender 1997b), are mapped in an accessible (preferably digital eg. GIS) form and are readily available at Councils and MW to assist with guiding planning decisions under Planning Schemes. The maps should particularly denote: • Areas with high sensitivity for ground sites in the municipalities of Hume, Whittlesea, Moreland and Darebin; • Areas with high sensitivity for scarred trees (refer Gazetteer of Scarred Trees, Ellender, 1997b) in the municipalities of Whittlesea and Hume; • Areas with medium sensitivity for all site types - applies to areas mapped where land is 5 hectares or greater and where there is a linear strip greater than 500 metres in total.	Hume[P], Whittlesea*, Moreland*, Darebin* MW	MCMC, AAVHSB, WTLCCHC	✓	$$	High
AH4	Provide notice of planning applications to AAVHSB where areas of archaeological sensitivity are likely to be impacted by development proposals.	Hume, Whittlesea, Moreland, Darebin	MCMC, AAVHSB, WTLCCHC and/or KNCHO		$	High
AH5	Require proponents to undertake a survey for Aboriginal places, sites and objects on all land likely to be affected by a development where no survey work has been undertaken previously and where an area within the waterway corridor is defined as having archaeological sensitivity.	Whittlesea, Hume, Moreland, Darebin	MCMC, AAVHSB, WTLCCHC and/or KNCHO		$	High

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
AH6	Notify AAVHSB and WTLCCHC of circumstances where an archaeological investigation is necessary given heritage or other overlay controls and the nature of a proponent's proposal (eg. a change of land use or modification to the land surface)	Whittlesea, Hume, Moreland, Darebin	MCMC, AAVHSB, WTLCCHC		$	High
AH7	Ensure that all known archaeological sites are included on the Historic Site Register held by Aboriginal Affairs Victoria, Heritage Services Branch	Whittlesea*, Hume[P], Moreland*, Darebin*, MW	MCMC, AAVHSB, WTLCCHC KNCHO	✓	$	High
AH8	Implement further archaeological surveys of Central and Edgars Creeks	Whittlesea*, Darebin*, Moreland*	AAVHSB, WTLCCHC MCMC	✓	$$	Medium
AH9	Following the obtaining of approval from the WTLCCHC, implement further archaeological surveys of other tributaries of the Merri Creek and other sites likely to possess archaeological finds (eg. alluvial terraces as in Rosengren, 1993)	Whittlesea*,	MCMC, AAVHSB, WTLCCHC	✓	$$	Medium
AH10	Commission archival and archaeological explorations (sub-surface testing) of pre and contact period structures at the Merri/Yarra confluence in order to better understand the site's significance and uncover evidence of a number of buildings once located in the vicinity	Yarra	MCMC, AAVHSB, WTLCCHC		$$	Medium
AH11	Notify landowners of responsibilities for protection of scarred trees, including: • the protection of trees under legislation; • the importance of preservation of dead scarred trees; • techniques to stabilise and make safe trees which are dangerous; and • procedures to be followed if lopping or removal is necessary.	Whittlesea, Hume	MCMC, AAVHSB, WTLCCHC KNCHO	✓	$$	Medium
AH12	Notify landowners of responsibilities for protection of archaeological sites and areas of sensitivity.	Whittlesea, Hume, Moreland, Darebin	MCMC, AAVHSB, WTLCCHC KNCHO	✓	$	High

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
AH13	Implement protection works along the lines of recommendations contained in Johnston and Ellender (1993) for archaeological sites at:					
	• Craigieburn Road 1, 2, 5;	Whittlesea*	MCMC, AAVHSB		$	High
	• Craigieburn Road 3-4	Hume[P]	MCMC, AAVHSB		$	High
	• O'Herns Road 1;	Whittlesea*	MCMC, AAVHSB		$	High
	• Cooper Street 3;	Hume	MCMC, AAVHSB		$	High
	• the Galada Tamboore complex of sites (1-11);	MW	AAVHSB, WTLCCHC Hume, Whittlesea		$	High
	• Mahoneys Road 1;	Hume	MCMC, AAVHSB		$	High
	• Edgars Creek 1 (near confluence of Merri);	Moreland*	MCMC, AAVHSB		$	High
	• Central Creek 1;	Darebin*	MCMC, AAVHSB		$	High
	• Central Creek 2.	Moreland	MCMC, AAVHSB		$	High
AH14	Implement protection measures for additional sites registered by Ellender (1997b - see Gazetteer) in the middle catchment	Whittlesea, Hume[P]	MCMC, AAVHSB, WTLCCHC	✓	$	High
AH15	Implement training in Aboriginal and historic places for field staff to: recognise Aboriginal artefacts; identify threatening processes; and understand legal requirements, especially for areas of high archaeological sensitivity	Whittlesea, Hume*, Moreland*, Darebin*, MW	WTLCCHC KNCHO, MCMC	✓	$$	High
AH16	Encourage preventative measures and programs along the creek on private rural and urban fringe land deemed to have archaeological sensitivity, to prevent erosion and stock pugging of known and unidentified sites. Focus where possible on sites nominated by Ellender, (1997b) at: Bald Hill 2; Briggs 1; Summerhill 2-5; Bullock Crossing; Jackhammer; and Cooper Street 1-3.	MW (Stream Frontage Management Program), Whittlesea, Hume[P]	MCMC, AAVHSB, WTLCCHC		$	High
AH17	Prevent access by horses, stock and unauthorised off-road vehicles to known sites and areas of high archaeological sensitivity where protection is afforded by Council Planning Schemes or where Council owns the land	Whittlesea, Hume, Moreland, Darebin	MCMC, AAVHSB, WTLCCHC KNCHO		$$	High

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
AH18	Investigate stream works to address erosion of the Briggs 4 site near Summerhill Road	MW	MCMC, AAVHSB, WTLCCHC		$$	Medium
AH19	Investigate the conduct of oral history and Aboriginal cultural research programs in the northern suburbs to further document and gather information	AAL	MCMC	✓	$$	Medium
AH20	Investigate less ground disturbing techniques (such as use of fire), to manage areas of archaeological sensitivity on publicly owned land if stock grazing is currently employed, and encourage similar measures on privately owned land.	MW, Hume, Whittlesea, AAV	MCMC		$	Medium
AH21	For archaeologically sensitive areas on publicly owned land, limit use of maintenance tracks by: • provision of fencing and gates; • avoidance of paving; and • prohibiting use in wet conditions; and encourage similar measures on privately owned land.	MW, Hume, Whittlesea, AAV	MCMC		$$	Medium
AH22	As part of future design for an extension of the Merri Path from Hatty Court, Campbellfield to Mahoneys Road and within the Retarding Basin (see TA8), seek advice from an archaeologist regarding a preferred location	Hume	MW, MCMC		$	Medium
AH23	Monitor archaeological sites to check for threats and the success of protection measures	AAVHSB	MCMC, WTLCCHC	✓	$	Medium

1.2 European Heritage

Background

Early European occupation of the lands of the Merri Creek corridor and catchment is comparatively well documented and can be sourced from local histories (eg. Broome, 1987; Lemon, 1983). The Merri Creek Study (PIRG, 1975) also provides a comprehensive overview of the early decades of European settlement, the growth of industry and its effects on the stream.

Since European settlement, the land along Merri Creek has supported farming, basalt and clay quarries, market gardens, industry, services and residential development.

Hall's work has again supplied an invaluable survey and compilation of information about structures and other evidence of the early years of European settlement, though it did not include areas upstream of Craigieburn or on Edgars or Central Creeks (Hall, 1989). His work also identified significant buildings and other structures along the creek from later times. In all, Hall identified 48 historic sites south of Craigieburn Road. Due to the comparative lack of development upstream of Craigieburn Road it is thought that there is an even greater likelihood of the discovery of sites associated with early pastoral development in the middle to upper catchment areas.

The most common remains of early European settlement are various types of stone structures, especially stone walls (Hall, 1989). These dry-stone walls date from a period between the 1850s and 1880s and are visible in areas upstream of Mahoneys Road where land has undergone less modification. They were built to provide boundaries for properties, assist with managing stock and clear paddocks of volcanic rubble (ibid, p. 51). There is some evidence that the first settlers in these parts chose land which was stony so that there would be plentiful building materials (Wuchatsch and Payne, in ibid, p. 56).

One of the more intact sites of European heritage is the remains of a farming complex of dry-stone walls, pens, mud and stone dwellings and out-buildings covering about 11 hectares in an area approximately opposite Patullos Lane, Somerton (Hall, 1989, p. 52-7).

Perhaps the most consistent use of the creek corridor from the time of European settlement has been for quarrying. The earliest quarries were situated between Heidelberg Road and the Yarra with the Melbourne Corporation Quarry operating from the 1850s at the site of the former Collingwood Tip near the end of Ramsden Street, Clifton Hill (now Quarries Park). The Collingwood Council Quarry opened in the 1880s adjacent to the above quarry. Fitzroy Council was also reported to have opened a quarry on the site of the present-day Westfield Reserve, just south of Heidelberg Road in the 1840s. Later Heidelberg Council opened an adjacent quarry below the now MacFarlane Burnet Centre for Medical Research. The remains of a third small quarry are still evident today just south of Westfield Reserve. Other important quarries were the Wales Quarry in Brunswick (later Whelan's Depot) and just to the east of the old Pentridge Stockade boundary near Coburg Lake. The most notable feature of the Wales Quarry was its depth - 51.8 metres at its western wall (Hall, p. 62).

Other important historic features identified by Hall were those associated with water use and transport (eg. Dights Mill), transport sites (eg. numerous bridges - Heidelberg Road, High Street, Murray Road etc.), drains (eg. Green Street Main Drain), and a number of gardens, retaining walls and paths.

The work of Johnston and Ellender (1993) has sought to further build upon Hall's research and many additional significant heritage items have been added to the database of information. Johnston and Ellender sourced information from local history studies, conversations with long-time residents, urban conservation studies and public authority records. A total of 107 historic sites were identified. Few of these sites have protection through Planning Schemes or the Historic Buildings Register or the Register of the National Estate. One site which has been listed on the Register of the National Estate is the area from Craigieburn to Mahoneys Road, including the Galada Tamboore area. The application was made in recent years by the Friends of Merri Creek.

An application has also been made for Dights Mill. Recent works at the site have sought to preserve the remains of the Mill structure.

A further significant European heritage site within the Merri valley is the Pentridge complex. It is of state significance as Victoria's largest and most important penitentiary. It also has important associations with the early quarrying of bluestone at Coburg Lake Reserve (Johnston and Ellender, 1993). Its significance has been highlighted by the recent decommissioning of the prison and the commencement of discussions about the future use of the site.

Johnston and Ellender have made a series of recommendations for protection of heritage sites. Most of these have become recommended actions in the table below.

Their recommendations included:

- protection for historic places through Council Planning Schemes;
- a provision in the "Policies and Guidelines for Development near Merri Creek" for protection of heritage sites; and
- mechanisms to ensure development proposals sought to conserve historic buildings and features (see further, section 5.1).

Issues

- Many of the upper tributaries of Merri Creek have not been adequately surveyed for historic sites, while lower tributaries have only been partially surveyed.
- Appropriate management practices for protection of historic sites have not been consistently implemented or applied along Merri Creek.

Objectives

- Protection of all significant European heritage sites within the Merri Creek corridor through local government planning schemes, landowner agreements, and sympathetic land management.
- Continued identification and conservation of sites of heritage significance and provision for their protection.
- Information provided to all land managers, both public and private, regarding locations of significant sites and their responsibilities for protection and management of them.
- Interpretation of sites of significance within a context of ensuring their management and protection.

Action Program **Note:** * in accountable SA (Statutory Authority) or LGA (Local Government Authority) column = MCMC assigned responsibility for delivery of the action by that Council and P = partnership arrangement for delivery, usually between LGA and MCMC. Overall Notional Cost = combined notional cost of action for accountable parties. N/A = column heading is not applicable. Priority = the agreed priority attached to the action by the steering committee for the Strategy, which may differ from individual agency's timeframes for commencement of implementation of the action due to an agency's budgetary processes.

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
EH1	Include identified sites from Johnston and Ellender (1993) in the Schedules to each Council's Heritage Overlay and ensure application of the heritage overlay permit requirements as set down in the Victorian Planning Provisions and the local Planning Scheme where adequate control is not achieved by an Environmental Significance Overlay	Whittlesea, Hume, Darebin, Moreland, Yarra	MCMC		$	High
EH2	Ensure continuing effective coverage of heritage issues in a future Development Guidelines for the Merri Creek document - through its monitoring, review and revision where necessary.	Whittlesea, Hume, Darebin, Moreland, Yarra[P]	MCMC, Heritage Victoria	✓	$	High

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
EH3	Provide information and advice to landowners and managers of heritage places so that they might manage those assets effectively	Whittlesea, Hume, Darebin, Moreland*, DI	MCMC, Heritage Victoria	✓	$	High
EH4	Investigate the provision of planning concessions and the permitting of otherwise prohibited uses, as an incentive for the conservation of regional and State significant places (see further Context Pty. Ltd., 1993, p. 18 and other relevant local heritage studies)	Whittlesea, Hume, Darebin, Moreland, Yarra	MCMC, Heritage Victoria		$	High
EH5	Lodge nominations to the Register of the National Estate for sites listed in Johnston and Ellender (1993, p. 54), ie.:			✓		
	• "Camoola" property in Merriang;	Whittlesea	MCMC		$	High
	• Summerhill homestead and farm complex;	Whittlesea	MCMC		$	High
	• farming complex and ford north of O'Herns Road (see Hall, p. 52-7);	Whittlesea	MCMC		$	High
	• Newlands Road bridge;	Moreland	MCMC		$	High
	• Murray Road bridge;	Moreland	MCMC		$	High
	• Pentridge;	Moreland	MCMC		$	High
	• East Coburg Primary School;	Moreland	MCMC		$	High
	• 1-9 Moreland Road (now Red Robin building);	Moreland	MCMC		$	Medium
	• Rushall Old Colonists Homes; and	Yarra	MCMC		$	High
	• Heidelberg Road Bridge.	Darebin and Yarra	MCMC		$	High
EH6	Lodge nominations with Heritage Victoria for sites recommended by Johnston and Ellender (1993, p. 54), ie.			✓		
	• "Camoola" property in Merriang;	Whittlesea,	MCMC		$	High
	• Summerhill homestead and farm complex;	Whittlesea,	MCMC		$	High
	• Remaining unprotected Westgarthtown sites in Thomastown; and	Whittlesea,	MCMC		$	High
	• Heidelberg Road Bridge.	Darebin and Yarra	MCMC		$	High
EH7	Develop interpretation programs for cultural and heritage sites where: they have been adequately surveyed and assessed; site stability is not questionable; and where protection can be provided through site supervision and signage.	Whittlesea*, Hume[P], Darebin[P], Moreland*, Yarra	MCMC, Heritage Victoria	✓	$$	Medium

1.3 Visual Character

Background

A background study (*Visual Analysis Report*, Loder and Bayly Consulting Group, 1993) of the visual character of the creek corridor was conducted for the preparation of the Merri Creek Concept Plan Final Draft (MPW & MCMC, 1994). The study examined eleven landscape character units from Heathcote Junction to the Yarra and devised seven themes to compliment the strengths of each of the eleven units.

While visual character is in many ways based upon subjective criterion, factors which can shape perceptions of the visual environment include:

- the extent of preservation of stream geomorphology and valley form (especially visually valuable escarpments and rock outcrops);
- the proximity of nearby development and the extent to which buildings address the creek corridor and are of architectural or historic merit;
- the extent of intrusion of services (eg. powerlines) and road crossings;
- intrusion of fill from adjacent development or from dumping;
- exotic vegetation and weed growth cover; and
- build up of litter (especially in vegetation) from stormwater and nearby building construction works, and other trash (including large items such as car bodies).

Overview of Visual Character - Headwaters to Urban Reaches

The visual character of the Merri Creek corridor varies significantly throughout its length. The main stem of the stream originates in the area between North and South Mountain Roads at Heathcote Junction. There is also a western arm which drains hills immediately to the north of Wallan township. Within these upper limits, the stream is contained within fairly steep country of the Great Dividing Range foothills. Loder and Bayly (1993), indicated that these foothills form important middleground and background views when seen from the creek. The stream also has some steep and partly eroding banks in this vicinity due to the predominantly thinner sedimentary soils (MMBW, 1988). A predominantly indigenous foothills woodland community of River Red Gums, Narrow-leaved Peppermint, Swamp Gums, Blackwoods and occasional Redbox provides an attractive visual setting (MMBW, 1988).

As the stream falls away from the Great Dividing Range it is contained within the Wallan Floodplain from about the Wallan-Whittlesea Road. Here it has mostly been diverted into a visually unattractive channel constructed for the purpose of protecting the north-eastern railway line.

In places the drain has dense patches of *Phragmites* and *Juncus*. The channel returns to a more natural form downstream of the now drained Hernes Swamp. Farming uses are predominant in this reach. This reach has a low absorbtive capability or capacity to absorb visual intrusion (Loder and Bayly, 1993).

Downstream of Hernes Swamp the creek exits its largest alluvial deposit and enters the area described by Rosengren as the Merriang Basalts (Rosengren, 1993). Here there are scattered River Red Gums along the stream between Merriang Park and Merri Creek Park. Again the creek is surrounded by agricultural land which extends to the stream bank (MMBW, 1988).

From adjacent to Bald Hill the stream channel becomes better defined with the creek flowing in a rocky channel cut into and bounded by lava flows from Bald Hill (Rosengren, 1993). From here the creek moves into the Donnybrook Road floodplain where once again there are scattered occurrences of River Red Gums and some managed parkland around the Donnybrook Mineral Springs Reserve (MMBW, 1988). The North-Eastern Railway line is visually prominent in this reach either running in close proximity to the creek near the Mineral Springs Reserve or crossing the stream near Bald Hill and further downstream below Donnybrook Road. A transmission line also crosses the creek at the same point. There are some dense stands of aquatic vegetation (*Phragmites*, *Juncus* and *Triglochin*) in this vicinity. Again this reach has a low absorbtive capability due to the openness of the rural landscape (Loder and Bayly, 1993).

Downstream of Donnybrook Road the terrain is gently undulating and the stream becomes narrower and the channel deeper with a rocky streambed. There is some good quality remnant vegetation in the area around Summerhill Road, especially upstream where the stream has been noted as having high scenic qualities and a good waterhole (MMBW, 1988; Loder and Bayly, 1993). At this point the stream exits its Donnybrook Road floodplain and enters the so-called Summerhill Road rapids (Rosengren, 1993).

The creek then remains in a fairly deeply incised valley for its length through Craigieburn until just before Barry Road where it flattens out somewhat before once again entering a well-defined form through much of the Campbellfield Retarding Basin area. The rocky escarpments of this section are amongst the strongest visual elements of the creek environment for its whole length. The absorbtive capacity of this section is medium to high due to the well-incised valley form (Loder and Bayly, 1993). However, their recommendation was that built structures should be limited to protect existing visual values.

Visual Character - Urban Reaches

From Craigieburn Road East, elements of the urban landscape begin to influence, and in some cases even dominate, the visual environment of the creek valley.

Many of the urbanised sections of the creek have been drastically altered through modification of the watercourse to increase its capacity. Trapezoidal channels have been created in these sections and many meanders straightened. As stated elsewhere, there has been a loss of stream morphology as well as the loss of floodplains through the filling of lower lying lands. In many situations, opportunities for improvement of the visual environment are constrained and amelioration of views will only be possible through the use of screening vegetation.

Within the urban reaches of the creek there have been virtually no developments in the past which have sought to address the waterway and its open space. One recent exception is the Aboriginal Elders Hostel at Parkview Avenue in Brunswick. Further, developments have generally not sought to take advantage of the creek setting through the use of boulevard roads within subdivisions. The Esplanade in Clifton Hill is perhaps one exception from an earlier era of urban planning.

(i) Outfall Drains

Outfall drains have also been a strong element of visual degradation within urban waterway environments. There are numerous local Council drains entering Merri Creek as well as Melbourne Water Main Drains.

Design guidelines need to be prepared to ensure the outfalls:

- first enter sediment trapping ponds, where this is feasible;
- are less visually intrusive and unattractive, and
- do not lead to scouring of soils where the pipe outfalls on the stream bank or a similarly erodible surface.

(ii) Powerlines

In times of less enlightened urban planning, waterway corridors were selected as appropriate locations for the installation of electricity infrastructure. There are many powerlines in the Merri Creek valley, the most prominent being the transmission line between Thomastown and Brunswick Terminal Stations, owned by GPU PowerNet. There can be little doubt that this line visually detracts from the waterway environment.

There are also a number of other lower voltage lines crossing open space areas in the lower catchment. Assistance for their relocation or undergrounding can be sought from the Department of Finance and Treasury's Powerline Relocation Committee.

In addition, in order to provide for maintenance and public safety, GPU PowerNet is required to maintain the easement associated with their lines. The method by which this objective is achieved can have considerable impacts on the visual character of the Merri Creek and its open space. In recent times there has been criticism of the extent of vegetation pruning undertaken to achieve these ends. Better coordination of GPU PowerNet's needs with those of the community are important for effective development of vegetation along the stream.

(iii) Industrial Developments, Fill and Rubbish

For users of the Merri Path, the intrusion of visual influences from external sources is most apparent within foreground views (Context Pty. Ltd. and Loder and Bayly, 1993). This is especially so where the creek valley is enclosed as a result of the waterway's incision and industrial development has occurred close to the break of slope.

Within the urban reaches of the creek this applies most particularly to areas of Reservoir. Here, while there have been some positive results from requirements placed on developers to provide screening vegetation (eg. downstream of Zinnia Street to Australia Post and other factories), there are also many industrial areas which continue to provide an intrusive presence. These have been detailed through the work by Loder and Bayly and especially include the areas below Broadhurst Avenue to Brex Court and again around Edwardes Street (Loder and Bayly, 1993).

However, visual intrusion and degradation is not merely confined to industrial developments. There are also instances of dumping of fill within the waterway's open space and on batters adjacent to the break of the valley slope. The Edwardes Street (Reservoir) "promontory", where fill appears to have been placed in preparation for a bridge crossing is an obvious example.

The dumping of car bodies and other rubbish is a further source of significant visual degradation of the stream environment. There have been persistent problems of dumping of cars over the escarpment downstream of Barry Road for at least the last 15 years. Car bodies are also dumped downstream of Broadhurst Avenue and in other parts of the stream through Fawkner. The dumping of rubbish at the end of Barry Road has been a further persistent problem, as is the incidence of litter entering the stream via the stormwater system and lodging in vegetation.

(iv) Housing and Urban Design

Perhaps one of the most significant sources of visual degradation of the urban reaches of the creek is associated with the strip of housing, roughly between Mahoneys Road and B. T. Connor Reserve on the Reservoir side of the stream. Here the housing development has been designed in a manner unsympathetic to the preservation of the visual character of the waterway and forms perhaps the longest section of visual intrusion within the urban reaches of the creek. In some instances the limited amount of land available beyond back fences will significantly constrain (or even deny), opportunities to provide screening vegetation.

Downstream of Coburg Lake the incidence of visual intrusion from housing and industry is now surprisingly limited. Again there are often limited opportunities to remedy unattractive views from housing and back fences (eg. downstream of Bell Street - both sides of stream - and Holden Street). On the other hand, there have also been positive results such as the vegetative screening of the former Northcote Electricity Depot and factories downstream of Beavers Road.

Future Prospects

In the future, as urban development spreads north beyond the current limits of Craigieburn, there will be opportunities to ensure that development is planned in a manner more sympathetic to the waterway's visual environment. The use of boulevard roads and other strategies to have development address the waterway should be equally applied to both new residential and industrial development. An approach which considers industrial areas to be less important and, in any case, inherently unattractive, is counter-productive to achieving positive outcomes for protection of the waterway corridor. Experience of recent years along the lower Yarra has shown that industrial development along waterways can sympathetically address the stream.

Policies and guidelines for development near the Merri Creek were drafted through one of the background studies for the 1994 Merri Creek Concept Plan Final Draft (see Context Pty. Ltd., 1993, Vol. 2). Two of the five policies for land use planning include statements which would ensure future development considers, and does not degrade, the visual character of the creek corridor. The guidelines applying to building siting and design are especially relevant to protection of visual character. The guidelines state that buildings should be of a scale and colour such that they do not intrude into the landscape. The Subdivision Layout and Design guidelines are also relevant to protection of visual character (see Context Pty. Ltd., 1993, Vol. 2).

The preparation of a Development Guidelines for the Merri Creek has been commissioned by MCMC (see Integrated Urban Management, in prep.).

Merri Creek Arts Plan

The Merri Creek Arts Plan was developed as a joint project between Moreland Council and the Merri Creek Management Committee and was funded through a grant from the Australia Council. Completed in 1995, the document canvassed ideas for possible art works of a distinctive local character to be appropriately located within the Merri Creek Parklands. The Plan recommended pilot projects for art works

and developed a strategy for adoption of the Plan's directions. There is potential for the application of the Plan to other areas and its referral to the remaining Councils appears to be warranted.

Issues

- Past urban development which abuts the creek corridor is often intrusive and at times dominating of the visual environment.
- There have been no consistent planning or design guidelines for the future development of the creek corridor or for the adjacent private lands.
- The historic use of waterway corridors by service utilities has often caused visual degradation of the corridor. This is particularly so with the numerous powerlines (high and lower voltage) which cross or at times run parallel with, or within, the valley in the urban reaches. Opportunities for removal or undergrounding of powerlines need to be taken up as they become available.
- Better coordination between GPU PowerNet and Councils will be required to achieve development of sustainable vegetation and to avoid losses associated with pruning works along easements.
- The appearance of many outfall drains is visually unattractive with design dominated by functional criteria.

Objectives

- Waterway and open space views protected from intrusive developments through implementation of policies, guidelines and planning measures for new and re-developments within the viewshed of the waterway corridor.
- Vegetation management and well-designed screening vegetation to enhance the visual environment of the corridor and protect views for creek users.
- Protection of stream geomorphology, the valley form and key landscape features such as gorges, escarpments and stands of old River Red Gums
- Continuing exposure of escarpments and rocky outcrops through weed management.
- Reintroduction of in-stream rock riffles in areas where stream morphology has been lost, the use of basaltic rocks in landscaping and use of compatible art works where there are opportunities to replicate or emphasise the visual character of the creek corridor.
- Outfall drains demonstrating sensitive design emphasising use of natural rock or other visually pleasing elements, and incorporating necessary drainage and stormwater treatment considerations.

Action Program

Note: * in accountable SA (Statutory Authority) or LGA (Local Government Authority) column = MCMC assigned responsibility for delivery of the action by that Council and P = partnership arrangement for delivery, usually between LGA and MCMC. Overall Notional Cost = combined notional cost of action for accountable parties. N/A = column heading is not applicable. Priority = the agreed priority attached to the action by the steering committee for the Strategy, which may differ from individual agency's timeframes for commencement of implementation of the action due to an agency's budgetary processes.

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
VC1	Complete and seek approval of a Development Guidelines for the Merri Creek or similar document to further facilitate protection of the visual character of the corridor from new developments.	Whittlesea, Hume, Moreland, Darebin, Yarra	MW MCMC	✓	$	High

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
VC2	Investigate all available options to reduce the impacts from visual intrusion into the creek valley of new or existing developments. Include: consideration of seeking a change of activity or land use; requirements for screen planting as a condition on permits; or the undertaking of revegetation on publicly owned land.	Whittlesea, Hume, Moreland, Darebin, Yarra	MW MCMC	✓	$$	High
	Investigate the following specific areas:					
	• Craigieburn south industrial area;	Hume	MCMC		$$	Medium
	• Mahoneys Road to B. T. Connor Reserve, Reservoir;	Darebin	MCMC		$$	High
	• McBryde Street, Fawkner (downstream of Hood Crescent);	Moreland	MCMC		$$	Medium
	• St. Basil's Homes, Fawkner;	Moreland	MCMC		$$	Medium
	• Coburg Drive-In vicinity/Trade Place, North Coburg	Moreland	MCMC		$$	Medium
VC3	Maintain and extend existing buffer plantings to screen visual intrusions:			✓		
	• Craigieburn south;	Hume[P]	MCMC		$$	Medium
	• Barry Road/Sarah St., Campbellfield;	Hume[P], MW	MCMC		$	High
	• Broadhurst Avenue to below Brex Court, Reservoir;	Darebin	MCMC		$$	High
	• Hardie-Iplex site downstream of Lakeside Secondary College;	Darebin	MCMC		$	High
	• Newlands industrial estates (downstream of Zinnia Street), Reservoir;	Darebin	MCMC		$	High
	• Downstream of Bell Street (both sides), East Coburg/West Preston;	Darebin, Moreland	MCMC		$$	Medium
	• Holden Street, North Fitzroy.	Yarra	MCMC		$	High
VC4	Seek discussions with the Powerlines Relocation Committee (Department of Treasury and Finance) to develop proposals and seek funding assistance to relocate, remove or underground powerlines, focussing initially on lower voltage lines in the urban catchment.	Moreland and Darebin initially	MCMC	✓	$	High
VC5	Develop guidelines to improve the visual appearance of existing and new outfall drains and include in a Development Guidelines for Merri Creek or similar document	MW, Whittlesea, Hume[P], Moreland*, Darebin[P], Yarra*	MCMC	✓	$	High
VC6	Investigate issues and means to improve the visual appearance of existing and new outfall drains owned by Melbourne Water. Include investigation of:	MW	MCMC		$	Medium
	• Ainslie Road Drain;					
	• Campbellfield Creek diversion Drain;					
	• outfall of Edwardes Lake;					

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
VC6 cont'd	• Fawkner East Main Drain; • Harding Street Main Drain; • Elizabeth Street Main Drain; • The Avenue Main Drain; • Sumner Avenue Main Drain; • Glenlyon Road Main Drain; • Lygon Street/Park Street Diversion Main Drain; • Green Street Main Drain; • Alexandra Parade Main Drain.					
VC7	Investigate issues and means to improve the visual appearance of existing and new outfall drains owned by Councils.	Whittlesea, Hume[P], Moreland*, Darebin*, Yarra*	MCMC	✓	$$	Medium
VC8	Construct and maintain fencing and control of vehicular access such that abandonment of car bodies and rubbish dumping can be curtailed on lands for which each agency is responsible.	Whittlesea, Hume, Moreland, Darebin, MW	MCMC	✓	$$	High
VC9	Continue programs of removal of car bodies from the creek corridor.	MW	Councils		$	High
VC10	Seek to limit the number of creek road crossings and ensure designs are visually sympathetic and have adequate off-setting revegetation works.	Whittlesea, Hume, Moreland, Darebin	MCMC MW	✓	$	High
VC11	Continue to expose escarpments, other rocky outcrops and key waterway and landscape forms through weed control and vegetation management on lands for which each agency is responsible.	Whittlesea*, Hume[P], Moreland*, Darebin*, Yarra, MW, PV	MCMC	✓	$$	High
VC12	Encourage the sensitive use of basaltic rocks and indigenous plants in new landscape plans and works and develop community art projects using natural themes.	Whittlesea, Hume[P], Moreland*, Darebin, Yarra[P]	MCMC FOMC	✓	$	High
VC13	Investigate referral of the "Merri Creek Arts Concept Plan" to remaining Councils for comment and seek its adoption	MCMC		✓	$	High
VC14	Develop guidelines for design and location of signs, and hoardings to limit their size and number and ensure less intrusive positioning.	Whittlesea*, Hume[P], Yarra[P], Moreland, Darebin[P]	MCMC	✓	$	High

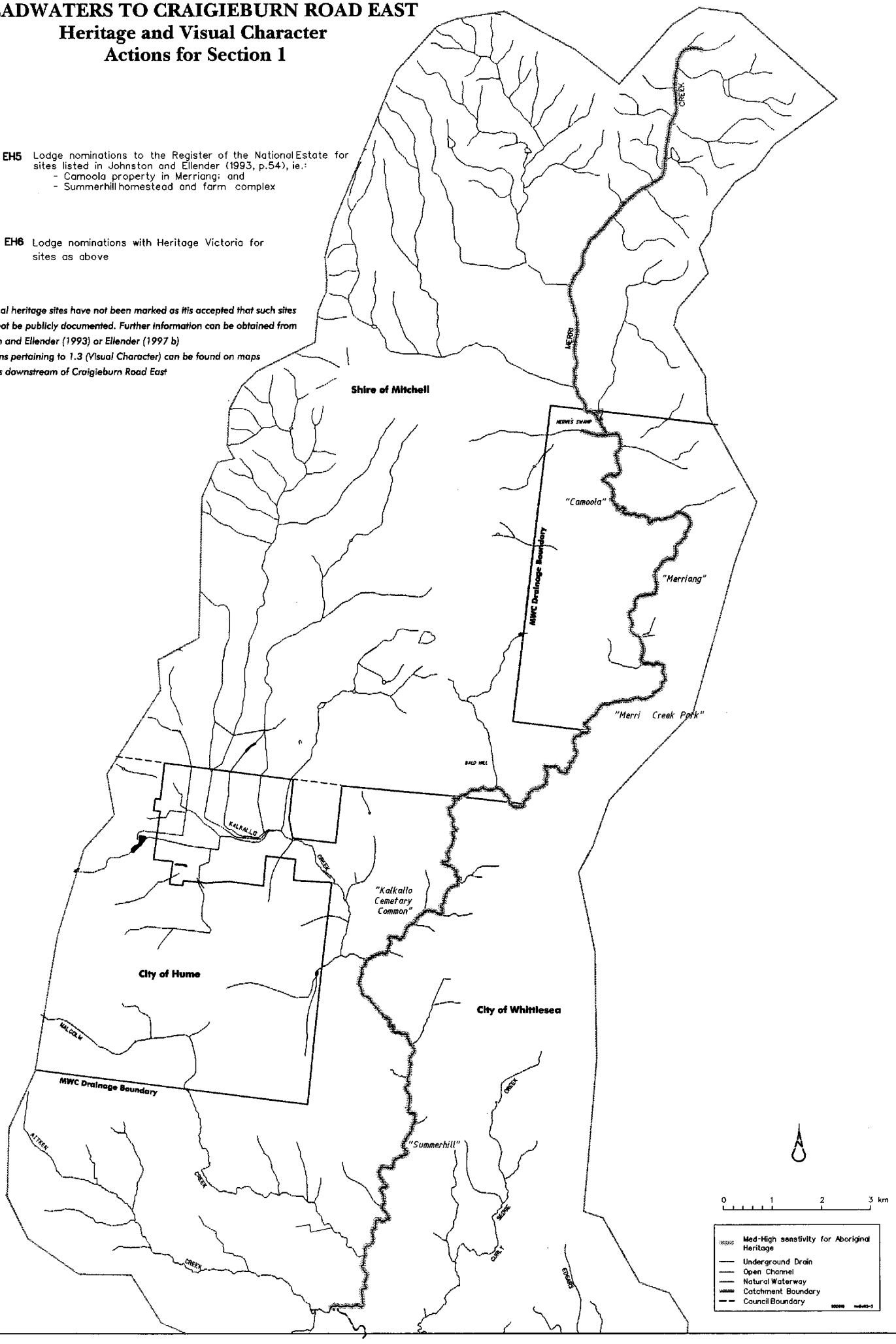
HEADWATERS TO CRAIGIEBURN ROAD EAST
Heritage and Visual Character
Actions for Section 1

EH5 Lodge nominations to the Register of the National Estate for sites listed in Johnston and Ellender (1993, p.54), ie.:
- Camoola property in Merriang; and
- Summerhill homestead and farm complex

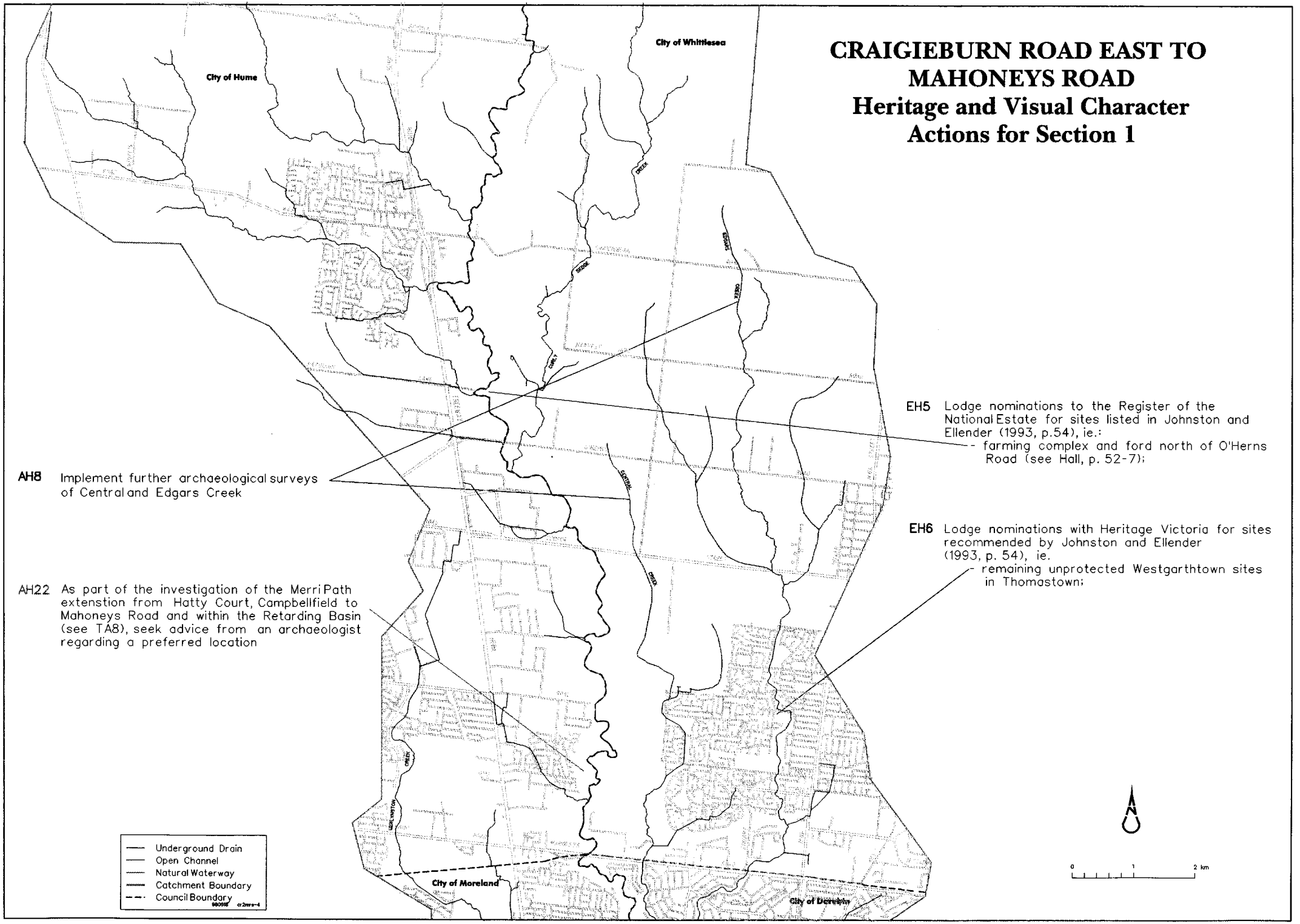
EH6 Lodge nominations with Heritage Victoria for sites as above

Note :

Aboriginal heritage sites have not been marked as itis accepted that such sites should not be publicly documented. Further information can be obtained from Johnston and Ellender (1993) or Ellender (1997 b)
All actions pertaining to 1.3 (Visual Character) can be found on maps for areas downstream of Craigieburn Road East



CRAIGIEBURN ROAD EAST TO MAHONEYS ROAD
Heritage and Visual Character Actions for Section 1

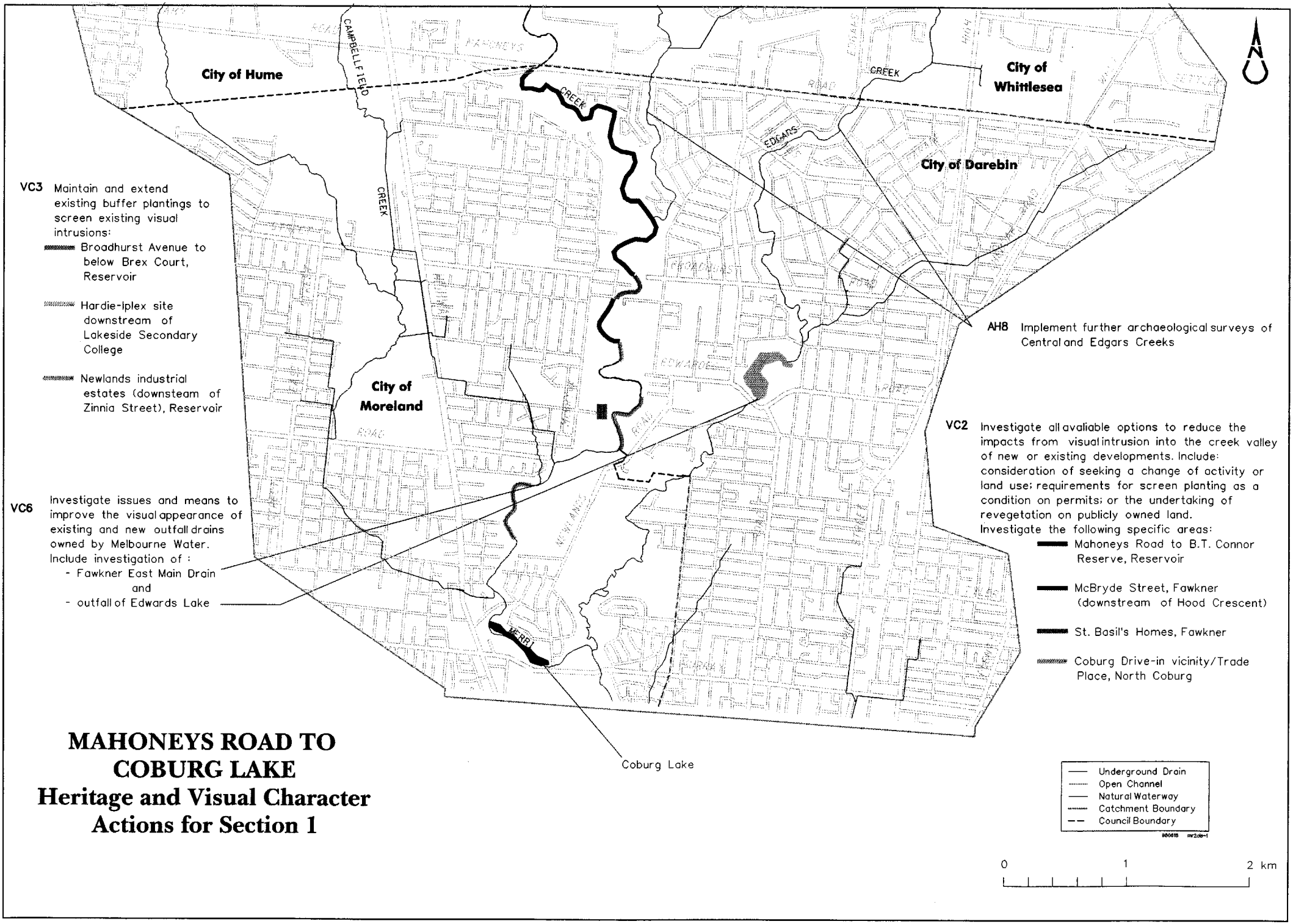


AH8 Implement further archaeological surveys of Central and Edgars Creek

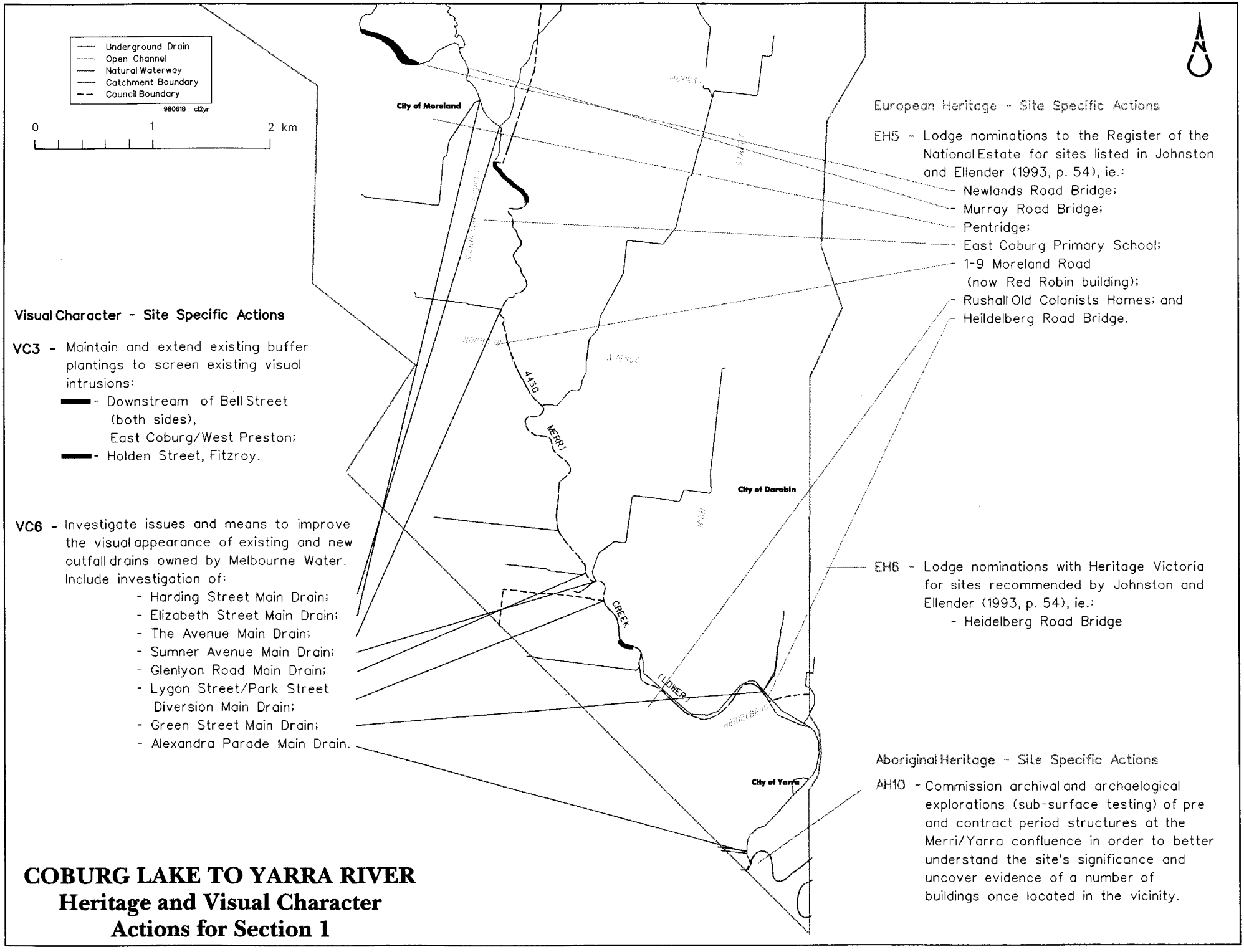
AH22 As part of the investigation of the Merri Path extenstion from Hatty Court, Campbellfield to Mahoneys Road and within the Retarding Basin (see TA8), seek advice from an archaeologist regarding a preferred location

EH5 Lodge nominations to the Register of the National Estate for sites listed in Johnston and Ellender (1993, p.54), ie.:
- farming complex and ford north of O'Herns Road (see Hall, p. 52-7);

EH6 Lodge nominations with Heritage Victoria for sites recommended by Johnston and Ellender (1993, p. 54), ie.
- remaining unprotected Westgarthtown sites in Thomastown;



MAHONEYS ROAD TO COBURG LAKE
Heritage and Visual Character Actions for Section 1



Visual Character - Site Specific Actions

VC3 - Maintain and extend existing buffer plantings to screen existing visual intrusions:

- Downstream of Bell Street (both sides), East Coburg/West Preston;
- Holden Street, Fitzroy.

VC6 - Investigate issues and means to improve the visual appearance of existing and new outfall drains owned by Melbourne Water. Include investigation of:

- Harding Street Main Drain;
- Elizabeth Street Main Drain;
- The Avenue Main Drain;
- Sumner Avenue Main Drain;
- Glenlyon Road Main Drain;
- Lygon Street/Park Street Diversion Main Drain;
- Green Street Main Drain;
- Alexandra Parade Main Drain.

European Heritage - Site Specific Actions

EH5 - Lodge nominations to the Register of the National Estate for sites listed in Johnston and Ellender (1993, p. 54), ie.:

- Newlands Road Bridge;
- Murray Road Bridge;
- Pentridge;
- East Coburg Primary School;
- 1-9 Moreland Road (now Red Robin building);
- Rushall Old Colonists Homes; and
- Heildelberg Road Bridge.

EH6 - Lodge nominations with Heritage Victoria for sites recommended by Johnston and Ellender (1993, p. 54), ie.:

- Heidelberg Road Bridge

Aboriginal Heritage - Site Specific Actions

AH10 - Commission archival and archaelogical explorations (sub-surface testing) of pre and contract period structures at the Merri/Yarra confluence in order to better understand the site's significance and uncover evidence of a number of buildings once located in the vicinity.

COBURG LAKE TO YARRA RIVER
Heritage and Visual Character Actions for Section 1

SECTION 2 - Flora, Fauna and Open Space

Introduction

This section gives an overview of the terrestrial issues related to the biological and open space values of the Merri Creek corridor. It contains an assessment of three broad reaches of the creek from its headwaters to the Yarra River. These three reaches have been segregated on the basis of the common land use and open space issues which arise in each of them. The reaches are summarised in the three sub-sections which follow.

There are considerable biological values present along Merri Creek and its adjoining lands. It is an agreed objective of this Strategy to seek the development, as far as possible, of continuous habitat along the stream corridor principally through a variety of vegetation management means, including revegetation. To this end it is understood that flora and fauna preservation and rehabilitation, as well the use of open space for habitat creation and enhancement, will be facilitated by the various public landowners and managers within their operating charters.

In addition, to provide for long-term protection for the total range of fauna and fauna found within the corridor, actions on private land which enhance conservation values will also need to be encouraged. This is especially necessary in a context where extensive areas of native grassland can still be found on farming lands in the corridor.

Central to the corridor's biological values are a number of grassland sites in the middle catchment areas. Friends of Merri Creek have been actively pursuing the conservation of many of these sites since the late 1980s and have received support from Merri Creek Management Committee (MCMC) since. There has also been support for greater emphasis on grassland conservation through peak bodies such as the Victorian National Parks Association (VNPA) and the Trust for Nature. The VNPA's publication, *The Melbourne Grasslands Park* (VNPA, 1993), promoted the concept of a multi-sited conservation reserve system for conservation of grasslands to the north and west of Melbourne. Although fragmented spatially, the Park would be united by a common management plan. The Merri Creek Grasslands comprised one of five key sites for the Park concept across the northern and western parts of greater Melbourne.

The Department of Natural Resources and Environment (DNRE) has been involved in discussions to conserve a range of grassland sites in the Merri catchment over the last decade. The Department's actions include:

- moves to purchase the Craigieburn grassland;
- facilitation of purchase of the 23 hectare portion of the Cooper Street grassland in 1992;
- preservation of grasslands at Bald Hill through development of a management plan linked to a quarry development; and
- investigation and use of planning measures to preserve a site of remnant grassland at Mt. Ridley.

The Friends of Merri Creek and the MCMC continue to support measures, including acquisition, to protect these and other parcels of remnant grassland so that a grassland reserve system can be established in the Merri Creek catchment. This document acknowledges the advocacy role which the Friends and MCMC can play in seeking to achieve such a goal.

On-ground management of grasslands is an evolving science and often a variety of measures are required to achieve effective management and preservation of sites. Strategies for management may include: use of periodic mosaic burns; control of woody and herbaceous/grassy weeds; control of grazing, taking into account the history of site grazing and weed growth implications from reduced grazing; and control of unwanted vehicle access or pedestrian traffic.

The need for continued development of skills in grassland site management has been understood for some time. The growth of this expertise will be critical to the management of current and future grassland reserve areas wherever they might be created. An informal Merri Plains Grassy Ecosystem Reference Group currently meets to discuss issues of grassland management within the Merri catchment.

The three main reaches of the creek examined in this section are:

(i) Headwaters to Craigieburn Road East
This reach is comprised of rural land where there are many important sites of flora and faunal significance. Issues are to do with seeking long-term protection of the lands of the stream corridor and significant sites through:

- improvements to stream frontage management practices;
- the investigation and negotiation of covenants on titles and other means to ensure protection of significant sites;
- the introduction of local government planning policies and planning scheme provisions to seek protection of sites of biological importance worthy of preservation due to their high conservation values;
- development of cooperative management plans for biologically significant sites between local government and state agencies;
- encouragement of Landcare and Land for Wildlife programs; and
- investigation of financial and other incentives for landowners to encourage and sustain management in sympathy with the conservation significance of the land.

(ii) Craigieburn Road East to Mahoneys Road
This reach covers key parts of the middle to lower catchment and includes grassland remnants at Craigieburn, Cooper Street and some smaller remnants at the Campbellfield Retarding Basin (Galada Tamboore).

Some key issues for this reach include:

- future protection and management of the Craigieburn grasslands; and
- the current review of the proposed Hume Freeway alignment.

(iii) Mahoneys Road to the Yarra
Within this urban reach there is already an identifiable and established open space or public use zone along the waterway corridor. The issue in this reach relates to its management.

However, there are also a small number of significant sites (eg. Jukes Road grassland) and a large number of often isolated pockets of indigenous remnant plants which are valuable remnants of the original basalt plains grassland flora.

Key issues include:

- preparation of plans to develop and manage areas of remnant vegetation, revegetate degraded sites and create open space nodes;
- acquisition of some comparatively small frontages to improve access and open space provision; and
- the securing of opportunities for open space development associated with sites undergoing a change of land use (eg. Pentridge).

2.1 Headwaters to Craigieburn Road East

Background

At its upper limits at Heathcote Junction, Merri Creek is contained within steep country of the Great Dividing Range foothills. There is a predominantly indigenous woodland community of River Red Gums, Narrow-leaved Peppermint, Swamp Gums, Blackwoods and occasional Redbox in the vicinity of the stream (MMBW, 1988).

As the stream falls away from the Great Dividing Range it is contained within what Beardsell describes as the Merri Upland Volcanic Plains, which covers the area between Wallan East and Donnybrook (Beardsell, 1997, vol. 1, p. 11, Print Version of CD). Within this reach, Merri Creek is mainly an occasional or ephemeral stream running in winter-spring and after summer rains.

The most significant habitats within this reach are the plains riparian scrub, cliff/escarpment shrubland, stony knoll grasslands, plains grasslands and seasonal wetlands. The latter type is best represented at Kalkallo Common and Hernes Swamp (Beardsell, 1997, vol. 1, p. 11, Print Version of CD).

Hernes Swamp

Drained in the 1940s, Hernes Swamp has floral significance based upon the nationally endangered *Lepidium hyssopifolium* and *Helichrysum* sp. aff. *acuminatum* having been recorded at the site. Its fauna is also considered of State significance, mainly on the basis of the presence of Striped Legless Lizard (Schulz and Webster, 1991; Beardsell, 1997, vol. 2, p. 22, Print Version of CD).

Hernes Swamp is a grassy wetland or freshwater meadow which has been listed by Beardsell as a Critical Conservation Area for grassy wetland habitat within the north-eastern region of Melbourne. It is the only intact wetland of its type remaining north of Melbourne (Beardsell, 1997, vol. 2, p. 20, Print Version of CD). Although it is now drained and carries little water and few waterbirds most years, before its draining the Swamp would have been an extensive shallow freshwater marsh holding water for up to six months. It would have supported thousands of waterfowl and ibis for extended periods during winter-spring. At the time of European settlement the Swamp would have likely supported the Magpie Goose, Australian Bustard and Brolga (Beardsell, 1997, vol. 2, p. 23, Print Version of CD).

Hernes Swamp would have been part of a wetland complex, including Camoola Swamp to the south-east, and 'Inverlochy' Swamp', together covering over 1,000 hectares in total (Beardsell, 1997, vol. 2, p. 14, Print Version of CD). In terms of its geological origins, Hernes Swamp developed from the blocking by lava flows of several drainage lines causing the formation of an alluvial terrace (Rosengren, 1993).

While Hernes Swamp has undergone many changes since the 1940s, recent pastoral land management intensification and a change from sheep to cattle grazing has worsened the cause of its preservation (Beardsell, 1997, vol. 2, p. 26, Print Version of CD). If its flora and fauna values are to be restored, the Swamp will require fencing and blocking of drainage lines to return it to a more permanent marsh.

Some of the integral relationship between Merri Creek and Hernes Swamp has been lost in recent decades. The creek itself has been impacted heavily by grazing with stock having access to both sides of the stream down to the water. The native vegetation is severely depleted and the Swamp Gums are dying from senescence, salinity and grazing related causes. The channelised stream is in poor condition with bank erosion and loss of vegetation (Beardsell, 1997, vol 2, p. 26, Print Version of CD). It requires significant improvement in order to transfer better quality water downstream.

Further, Schulz and Webster have remarked that "strict controls must be enforced against contaminated runoff entering this site from the Wallan Sewerage Treatment Area to the north." (Schulz and Webster, 1991). The Wallan Sewerage Treatment Plant is operated by Goulburn Valley Water and is licensed by the EPA to discharge to land only. An upgrade of the Plant to accommodate the possible future sewering of Heathcote Junction and Wandong is anticipated.

Schulz and Webster further noted that pasture improvements such as rock clearing, top dressing and sowing of pasture species have, particularly in the southern sections, converted the sparse native tussock grassland into a pastureland sward possibly unable to support Plains-wanderer and Red chested Button-Quail - two species present at the Bald Hill site downstream. They recommended that a survey to assess the distribution and abundance of Striped Legless Lizard be undertaken (Schulz and Webster, 1991). During their survey work a single Striped Legless Lizard was found in a deep hole dug on the edge of Hernes Swamp in the V-Line railway reserve. They noted that suitable rocky grassland habitat for the Lizard existed west of the railway line and along Merri Creek (Schulz and Webster, 1991).

Schulz and Webster further recommended that the V-Line railway reserve be set aside as a Flora and Fauna Protection Zone. This is currently being addressed through the development of a Public Authorities Management Agreement (PAMA) under the Flora and Fauna Guarantee Act, for conservation management of all rail reserves throughout the State. In the event of any lowering of the faunal significance of the remainder of the site, a prime habitat corridor needs to be established linking Hernes Swamp with the Bald Hill site both along the rail reserve and the creek corridor. The authors argued that this should be part of a regional habitat link strategy (Schulz and Webster, 1991). Beardsell has also indicated that the site should form part of the Strategic Habitat Link Network connecting it to the Bald Hill site (see map in Beardsell, 1997).

Further downstream, significant sites were assessed by Ecological Horticulture at Merriang and at Beveridge Road. The former was noted to be of regional significance on the basis of its River Red Gum population. The latter is a site of regional to State significance for its floodplain grassland (Ecological Horticulture, 1993). It should be noted that both of these sites are included within Schulz and Webster's definition of the State significant Upper Merri Creek and Hernes Swamp area which extends almost to Merri Creek Park (see maps appended to Schulz and Webster, 1991).

Bald Hill

Immediately abutting the Upper Merri Creek and Hernes Swamp area, according to the maps and definitions used by Schulz and Webster (1991), is the Nationally significant Bald Hill site. Schulz and Webster define this area as extending from Beveridge Road in its north-west corner, to immediately adjacent to the Donnybrook Mineral Springs Reserve at its southern limits (see maps appended to Schulz and Webster, 1991). This extends considerably the area examined by Frood (1992) and DCE (1990), though it does not take in the areas to the south-east including "Braelands" considered by Beardsell to be contiguous with the Bald Hill site (see maps accompanying Beardsell, 1997)

The Bald Hill site has National significance for fauna on the basis of the presence of species such as the Grassland Earless Dragon seen by Beardsell in October 1988 along the Merri Creek escarpment (Beardsell, 1997, vol. 2, p. 35 Print Version of CD; also Schulz and Webster, 1991, p. 14; Larwill *et. al.*, 1994, p. 44). There has only been the one sighting due to difficulties in finding the species. The suitability of habitat along both sides of the creek for the Grassland Earless Dragon has been remarked upon in all reports.

The site's rocky grassland appears to be prime habitat for the Striped Legless Lizard (Schulz and Webster, 1991). However, the species has not been recorded in surveys of the site (Larwill *et. al.*, 1994), although it has been recorded from the local area to the north and south of the Bald Hill site (Schulz and Webster, 1991).

Amongst other significant fauna species, Plains-wanderer was sighted on rocky grassland in "Braelands" in the summer of 1983 and is likely to still persist (Beardsell, 1997, Vol. 2, p. 36, Print Version of CD).

Bald Hill has a number of other significant bird species due to the River Red Gum Plains woodland on the site. These include Tawny Frogmouth, White-winged Triller and Rufous Songlark. The Buff-banded Rail, Brown Quail and Latham's Snipe were also observed in *Poa* grassland in freshwater meadows (Schulz and Webster, 1991).

Schulz and Webster note that the present high faunal values of the Bald Hill site are due to its size and remoteness. Any future management of the site which saw it subdivided into urban or farmlet development would significantly reduce its faunal values.

A critical element of future management of the site will be preserving populations of the Grassland Earless Dragon. There is concern over whether it still survives in the locality as it was not recorded during pitfall trapping studies in 1995 (Beardsell, 1997, Vol. 2, p. 35, Print Version of CD). Beardsell noted that in recent years the habitat of the Grassland Earless Dragon along Merri Creek within the Bald Hill site has been heavily grazed by sheep with a consequent reduction in grassland cover and that these conditions, together with an increase in fox numbers, are not conducive to the Grassland Earless Dragon's survival (Beardsell, 1997, Vol. 2, p. 39, Print Version of CD).

Further survey work for Grassland Earless Dragon, Legless Lizard and Plains-wanderer has more recently been conducted by Larwill et. al., (1994). An environmental management plan has also been prepared through the proponents for development of the site.

Schulz and Webster's report also makes the recommendation that weed invasion problems (especially Cape Broom and Serrated Tussock), associated with disturbance during installation of the gas pipeline, which crosses the creek adjacent to Bald Hill, be addressed. The conditions to be applied to duplication works for the pipeline in the next few years are expected to provide for weed control along this section of the line.

Schulz and Webster describe the section of Merri Creek within the Bald Hill site as containing sections of rock riffles, tessellated basalt pavement, rock shelves forming small waterfalls and open water, pools and escarpments (Schulz and Webster, 1991). Beardsell records that one of only two known populations of Freshwater Blackfish in the Merri Creek occurs in the reedy pools upstream of the railway bridge adjacent to Bald Hill (Beardsell, 1997, Vol. 2, p. 36, Print Version of CD). Although there is no operational discharge from the Sewage Treatment Plant at Wallan to Merri Creek, Beardsell has questioned its impacts on water quality as unlikely to be favourable to the Blackfish and observed that stream management to improve water quality and protect the Blackfish is required (Beardsell, 1997, vol. 2, p. 36 and 40, Print Version of CD).

Beardsell believes that the Bald Hill site is a critical component in the linking of regional habitats, being between sites to the north, south (eg. Craigieburn grasslands) and south-east (Darebin and Barbers Creek headwaters). He recommends that conservation management of the Bald Hill site is critical for the successful movement of fauna in the Merri Creek valley. "The long term viability of faunal populations at Craigieburn Grassland depend on protecting upstream native grassland habitat links." (Beardsell, 1997, vol. 2, p. 39, Print Version of CD).

The flora of the Bald Hill site is of at least State significance, due to the presence of *Carex tasmanica* and *Psoralea tenax* (DCE, 1990, Frood, 1992). Based upon the area examined by Frood, the site can be said to possess five vegetation communities ranging from *Danthonia* grassland to riparian scrub (Ecological Horticulture, 1993).

This site requires further floral assessment as Frood's survey work only contained limited sampling (nine quadrats) and the extent of the better quality remnant vegetation was not fully determined, nor mapped (Frood, 1992). The quadrats sampled by Frood were from along Merri Creek and land to its south, and along land to the east of a drainage line situated to the east of the railway line. It was the sample on the drainage line, which Frood described as a Grey Clay Drainage-Line Complex, which contains *Carex tasmanica*. The maintenance of its population was recommended as a priority (Frood, 1992).

At Bald Hill, like many other upstream areas, there is some stock access to the creek from insufficient fencing on both sides of the stream. The creek is fenced on one side alternately providing some protection of escarpment areas and the riparian zone. River Red Gums also appear to be dying from salinity related causes. There is also some evidence of bank slumping where stock have trampled vegetation (Beardsell, 1997, Vol. 2, p. 40, Print Version of CD).

Much of the significant grassland vegetation at Bald Hill is on or adjacent to land which Boral Resources has an interest in quarrying. A site management plan has been developed and negotiated with interested parties (Mitchell and Whittlesea Councils, DNRE, Department of Infrastructure [DI], Victorian National Parks Association [VNPA], Merri Creek Management Committee [MCMC], and Boral) over recent years and is nearing completion. The intention is to develop the management plan to the point where it has broad consensus amongst interested parties so that when it accompanies a planning permit application for the quarries, both

Councils are in a better position to assess the application. The expectation is that this will shorten the application process and may reduce objections.

The site management plan is in the final stages of editing and includes the provision of a conservation zone covering five parcels of land within the site. The largest area is based on the creek and its fringes, while other conservation zones cover an area along the tributary of Merri Creek which comes off Bald Hill and another site near Donnybrook Road, on which there is an existing dam. The Site Management Plan puts a view that the majority of the site's biological values can be protected through the setting aside of these areas. There have also been discussions about the creation of a conservation covenant entered into with the Trust for Nature for the largest part of the conservation zone (ie. along Merri Creek).

Flora and fauna survey work was undertaken by Larwill *et. al.* (1994) as part of the background work for the preparation of the Site Management Plan. It extended the number of flora species listed by Frood but was unable to achieve sightings of Grassland Earless Dragon or Plain-wanderer (Larwill *et. al.*, 1994).

Kalkallo to Donnybrook

Further downstream is the comparatively short Kalkallo to Donnybrook section. This is assessed separately by Beardsell, while Schulz and Webster (1992) have considered it part of the larger Donnybrook to Craigieburn section, to which they assign State significance.

Beardsell, notes that the Australian Smelt, a notable fish species, was recorded about 1km. below the railway bridge (Beardsell, 1997, vol. 2, p. 44, Print Version of CD). It was Beardsell's view that the existence of this species was less secure due to the Wallan Treatment Plant and runoff from the site. There have been no specific studies which have confirmed that runoff from land irrigation at the Treatment Plant has been the cause of problems further downstream.

Freshwater crayfish and Short-finned eel have also been recorded in the vicinity (Beardsell, 1997, vol. 2, p. 41 and 45, Print Version of CD). Earthworks associated with dam construction and stock grazing are also contributors to water quality degradation and weed invasion. Again fencing and other stream frontage works are required in this reach.

Beardsell's report also placed emphasis on the need to protect the Kalkallo Common and Kalkallo Cemetery as a habitat link with the Merri Creek. It was also noted that the creek and rail reserve require a further flora survey, while the Kalkallo Common and Kalkallo Cemetery require intensive survey for flora and fauna (Beardsell, 1997, vol. 2, p.45-7, Print Version of CD).

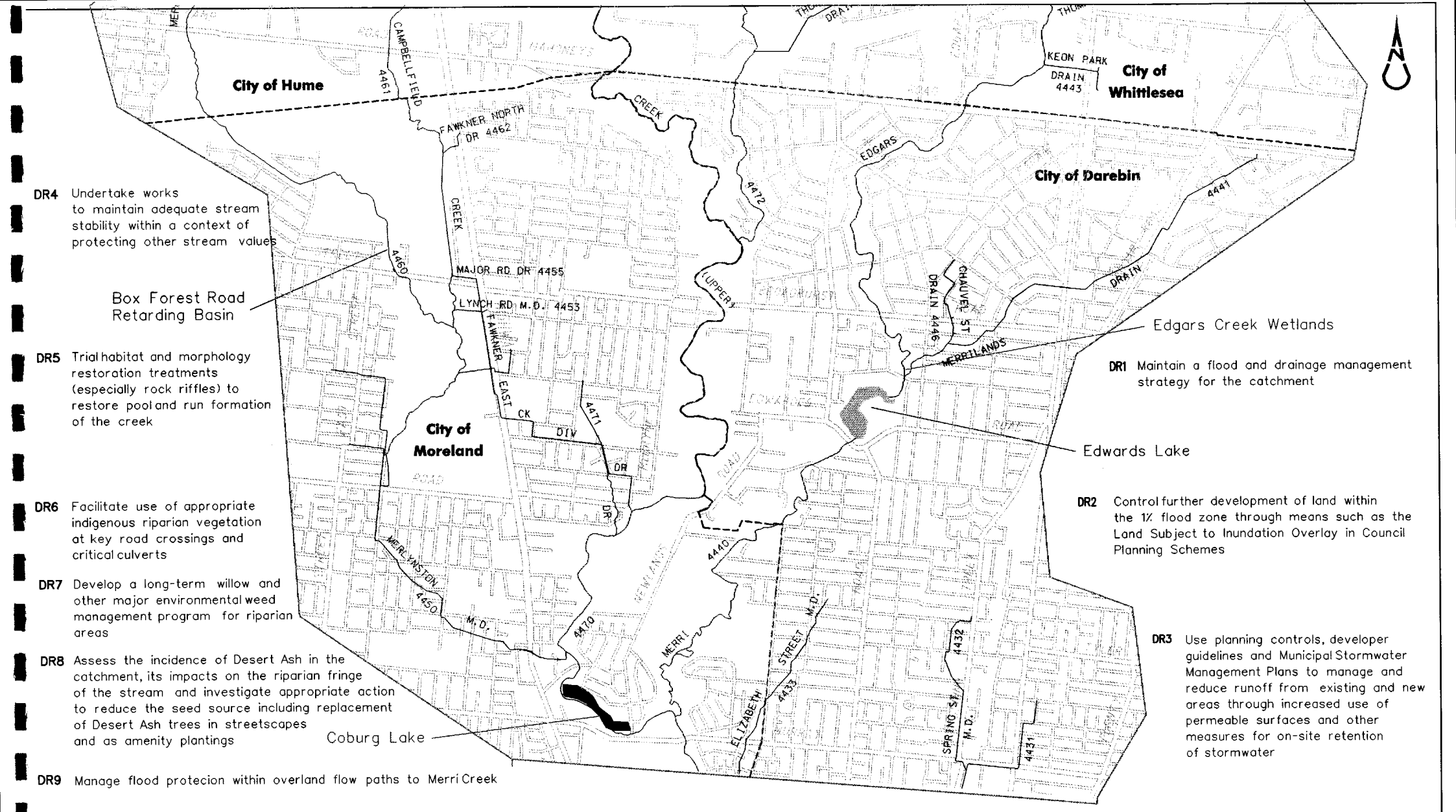
Donnybrook to Craigieburn

This reach of the stream is a mid-point between the upland and lowland volcanic plains of the creek system. Merri Creek becomes a perennial stream through this reach.

This stretch of the waterway has been assessed as having State significance for fauna on the basis of a population of Striped Legless Lizard found on the eastern escarpment of Merri Creek, south of the North-Eastern Railway bridge in November 1991 (see Beardsell, 1997, vol. 2, p. 88, Print Version of CD). It was noted that, due to the extensive habitat present, there may be a substantial population of the Striped Legless Lizard present in the vicinity of the find.

Freshwater Blackfish was also present in the pool upstream of Summerhill Road. In addition, Flat-headed Gudgeon has been recorded for this reach, as has Platypus which was observed upstream of Summerhill Road bridge in November 1991 and is likely to breed locally and is possibly the last population in the Merri system (Beardsell, 1997, vol. 2, p. 89-90 Print Version of CD).

Beardsell makes separate reference to the Summerhill Road area and the Merri catchment to the east which he deems to include the "Gas and Fuel" Swamp, "Bunker Hill" Swamp and the "Boonderoo" woodlands (Beardsell, 1997, vol. 2, p. 112, Print Version of CD). This area is generally within the headwaters of the recently named Curly Sedge Creek, or what Beardsell refers to as the Summer Hill drainage line. The area has State faunal significance on the basis of a number of species including the Plains-wanderer, last sighted in 1988, and the Fat-Tailed Dunnart located on a stony rise at the Pakenham Blue Metal site (Beardsell, 1997, vol. 2, p. 114-116, Print Version of CD). The "Gas and Fuel" Swamp contains rocky remnant grasslands and forms the headwaters of the Curly Sedge Creek which flows to the vicinity of the O'Herns Road Wetland where it joins Merri Creek.



DR4 Undertake works to maintain adequate stream stability within a context of protecting other stream values

DR5 Trial habitat and morphology restoration treatments (especially rock riffles) to restore pool and run formation of the creek

DR6 Facilitate use of appropriate indigenous riparian vegetation at key road crossings and critical culverts

DR7 Develop a long-term willow and other major environmental weed management program for riparian areas

DR8 Assess the incidence of Desert Ash in the catchment, its impacts on the riparian fringe of the stream and investigate appropriate action to reduce the seed source including replacement of Desert Ash trees in streetscapes and as amenity plantings

DR9 Manage flood protecion within overland flow paths to Merri Creek

DR1 Maintain a flood and drainage management strategy for the catchment

DR2 Control further development of land within the 1% flood zone through means such as the Land Subject to Inundation Overlay in Council Planning Schemes

DR3 Use planning controls, developer guidelines and Municipal Stormwater Management Plans to manage and reduce runoff from existing and new areas through increased use of permeable surfaces and other measures for on-site retention of stormwater

MAHONEYS ROAD TO COBURG LAKE
Waterway, Drainage & Flood Management Actions from Section 3.1

Map Indicates the Melbourne Water Drainage System for the Lower Merri Creek Catchment

Underground Drain
Open Channel
Natural Waterway
Catchment Boundary
Council Boundary

980618 mr2ckr2

0 1 2 km

The "Gas and Fuel" and "Bunker Hill" Swamps carry several hundred waterfowl during wet winter-springs. There have also been several notable (if now dated) recordings of rare fauna at the Summerhill Road sites, including the Eastern Barred Bandicoot and the Eastern Quoll which persisted in the Gas and Fuel Swamp/Summer Hill drainage line area until the 1930s (Beardsell, 1997, vol. 2, p. 115, Print Version of CD).

There are at least three notable flora species in the area: *Carex tasmanica* (Curly Sedge); *Psoralea tenax* (Tough Scurf-pea); and *Amphibromus* sp. aff *nervosus* (Swollen Swamp Wallaby Grass) (Beardsell, 1997, vol. 2, p. 112, Print Version of CD).

Beardsell has designated the site to be part of a Strategic Habitat Link connecting the most significant sites on the Merri and Plenty Volcanic Plains (Beardsell, 1997, vol. 2, p. 117, Print Version of CD). The Summerhill Road area itself has connections to the Craigieburn grassland and Edgars Creek headwaters sites to the south and the Bald Hill site to the north. Beardsell also considered the *Poa labillardieri* grass associated with plains grassland and grassy wetland in the valley of Curly Sedge Creek to be one of the largest stands in the north-east of Melbourne. Similarly, the River Red Gums plains woodland on the north-east section of "Boonderoo" and adjoining properties is one of the largest in the north-east of Melbourne (Beardsell, 1997, vol. 2, p. 112, Print Version of CD).

Increasing evidence of stream and groundwater salinity, poor land management resulting in weed invasion (especially Chilean Needle-grass), potential threats to groundwater from quarrying, and high fox numbers were listed by Beardsell as key issues for the area (Beardsell, 1997, vol. 2, p. 117-121, Print Version of CD).

Although the habitat along Merri Creek throughout the Donnybrook to Craigieburn section is more degraded than at the Craigieburn grassland site, like Beardsell, Schulz and Webster have stressed the importance of this reach for the habitat link which it provides with surrounding significant sites upstream and to the east (Edgars Creek headwaters - see Section 2.1 below) and the west (Mickleham-Mt. Ridley site, see below).

This section of the creek has not been subject to exhaustive flora surveys. A significance rating on the basis of flora is thus not possible. However, some locally rare or threatened species (Drooping Sheoak, Rock Correa, Sticky Boobialla) have been recorded on the Silurian escarpments downstream of the railway bridge. Downstream of Summerhill Road there are also the most extensive stands of Woolly Tea-Tree and other riparian species on Merri Creek (Beardsell, 1997, vol. 2, p. 86, Print Version of CD).

Schulz and Webster (1991) have recommended that a number of management issues be tackled including fencing of the stream and adjacent escarpments to exclude grazing and active discouragement of rock removal along the creek and on broad acre areas to the east of Summer Hill.

They also proposed that the area east of Summer Hill be incorporated into a Grasslands and Woodlands Protection Zone within the Planning Scheme due to its function as a habitat corridor and due to the potential presence of uncommon grasslands fauna (Schulz and Webster, 1991, p. 23). A similar zone under the new Planning Schemes might be the Environmental Rural Zone. Vegetation Protection Overlays might also be considered. Beardsell further recommended that the area be nominated as a Strategic Habitat Link within north-eastern Melbourne because a link between the Bald Hill and Craigieburn grasslands is critical for the long-term conservation of fauna at the Craigieburn site. This must be recognised during the planning of future urban growth (Beardsell, 1997, vol. 2, p. 91, Print Version of CD).

The Donnybrook to Craigieburn reach is likely to be threatened in future by possible urban development, increased salinity levels and habitat loss. It is imperative that the unsympathetically planned industrial development, which has taken place below Craigieburn Road between Hume Highway and Merri Creek, is not repeated. There are also threats posed by subdivision into small, unproductive farmlets and extensive rock clearing.

Cooperative programs with landowners (eg. Stream Frontage Management Program, Landcare, Land for Wildlife) along the stream corridor will be essential to the conservation management of this critical habitat link. Fencing out of stock, staged weed control, fox eradication, incentives for effective land management and other devices will be required to preserve the area's habitat function.

Investigation of the source of salinity will also be required as the groundwater which changes the stream from ephemeral to permanent at Summerhill Road may be a contributor.

In addition, it will be necessary to investigate the usefulness of planning scheme overlays to protect such sites from the impacts of development and a habitat protection incentive scheme. This would provide the potential for specific protection of significant rock outcrops or stands of native grassland or woodland vegetation.

Mickleham-Mt. Ridley site

Two key tributaries of the Merri - Malcolm and Aitken Creeks - have their origins near the southern boundaries of the Mickleham-Mt. Ridley site as defined by Schulz and Webster (1992). Cropper and Cherry (1997) identified both vegetation communities and species of State significance. In terms of its fauna, Schulz and Webster have already assigned it State significance on the basis of repeated sightings of Plain-wanderer and Swift Parrot. The Plains-wanderer inhabits uncultivated short, sparse *Danthonia* grazing land on 'Mount Ridley' and 'Kalkallo Park' (Schulz and Webster, 1991).

Schulz and Webster (1991) have recommended that this site be identified as a Grasslands and Woodlands Protection Zone within the local Planning Scheme. They indicated that it should follow the strategy for Red Gum Protection Zones in the Plenty Growth Corridor. In terms of the new Planning Scheme for Hume City Council this may translate into an Environmental Rural Zone or the application of an Environmental Significance or Vegetation Protection Overlay.

Schulz and Webster have also recommended that landowners be advised of land management requirements consistent with Plains-wanderer occurrence and that encouragement be given for present farm practices which provide such habitat.

Schulz and Webster further recommend that incentives should be negotiated with the owner of the high quality *Themeda* grassland in the north-west of the site, as this is suitable habitat for Plains-wanderer. They made further recommendations for additional survey work to assess floral values, determine the presence of Striped Legless Lizard and the importance of the site for Plains-wanderer (Schulz and Webster, 1991).

Given the above, there are many opportunities to promote DNRE's Land for Wildlife program and encourage participation in Landcare activities both here and throughout this reach.

Issues

- There has been a lack of adequate protection measures introduced for many significant flora and fauna sites along the stream and its adjacent private freehold lands.

- Flora and fauna species which have been determined as vulnerable or endangered require urgent steps be taken to assist their protection.

- The draining of swamps and wetlands (including Hernes Swamp) has led to the loss of many values and attributes, such as habitat function, stream water quality protection and stream flow volumes and seasonality.

- A regional habitat link strategy along the lines of that recommended in Beardsell (1997), is needed in order to establish and preserve habitat corridor links between significant sites (Hernes Swamp, Bald Hill, Summerhill Road, Mickleham/Mt. Ridley, and Craigieburn and Edgars Creek Headwaters). Such links are essential if biological values are to be preserved, and particularly fauna passage between sites is to be retained.

- Additional flora and fauna survey work is required to determine populations of significant species likely to occur at sites such as Bald Hill, Mickleham/Mt. Ridley, the Summerhill Road area and others.

- Improved stream frontage management practices, including fencing in particular, are required at a number of locations to protect rocky escarpment areas, prevent further bank slumping and stock trampling of vegetation and improve water quality. Sites along Merri Creek include:
  - Hernes Swamp;
  - Bald Hill;
  - Kalkallo to Donnybrook; and
  - Donnybrook to Craigieburn.

- The Donnybrook-Craigieburn section and its associated Summerhill Road area plays a central linking role between other significant sites to the north, south, east and west. It is part of a link between the Bald Hill and Craigieburn grasslands and is critical for the long-term conservation of fauna at the

Craigieburn site and must be recognised as such during the planning of future urban growth. The area's critical role requires recognition as a Strategic Habitat Link within north-eastern Melbourne.

- Unsympathetically planned industrial development, of a type similar to that which has taken place below Craigieburn Road between Hume Highway and Merri Creek, poses a threat to significant sites, habitat links and the stream environment, if repeated within this reach.

- Subdivision of large rural areas into small farmlets and extensive rock clearing pose threats to the conservation of significant species and sites.

- The continuing development of measures within Local Government Planning Schemes will be required to protect significant areas from the impacts of future development. Such measures have been recommended for sites including:
  - the area east of Summer Hill due to its function as a habitat corridor and due to the potential presence of uncommon grasslands fauna (Schulz and Webster, 1991, p. 23); and
  - the Mickleham-Mt. Ridley site due to the presence of Plains-wanderer and Swift Parrot.

- Investigation of other means by which local government can support sound land management practices and help protect significant sites through means such as a habitat protection incentive scheme, needs to be examined.

- Negotiations need to continue with land owners at Bald Hill and Mt. Ridley to secure protection for significant sites at these locations.

- Minimisation of the impacts of the proposed F2 Freeway.

Objectives

- Protection of significant sites, maintenance and improvement of their populations of vulnerable, rare, threatened, and other indigenous species.

- Preservation of habitat links with other significant sites within the Merri Creek and neighbouring catchments.

- Restoration of the marshy herbfield character of wetlands (eg. Hernes Swamp) to enhance habitat function, assist in protection of stream water quality and aid stream flow volumes and seasonality.

- Improved stream frontage management practices to sustain indigenous vegetation cover, protect stream morphology and key landscape and visual features and ensure stream stability.

- An informed and sympathetic rural community able to manage the needs of providing continued habitat for significant species within the context of operating sustainable rural properties.

- Participation by landholders in Landcare and Land for Wildlife programs within the reach.

- Continuing local government and agency support and incentives for rural land owners who manage land for stream frontage protection and habitat preservation.

- Growth corridor and other strategic planning conducted with protection of biologically significant sites and habitat links as a primary consideration.

- Recognition of the Donnybrook-Craigieburn section and the associated Summerhill Road area as a Strategic Habitat Link within north-eastern Melbourne and critical to the conservation of fauna at a number of other sites in the Merri system.

Objectives *(continued)*

- Recognition of the need for preservation of Strategic Habitat Links within future growth planning exercises and through the adoption of appropriate zonings and overlays under Council Planning Schemes.
- The attachment of conditions to planning permits to require protection and restoration of the creek environment from impacts resulting from development proposals.

Action Program **Note:** * in accountable SA (Statutory Authority) or LGA (Local Government Authority) column = MCMC assigned responsibility for delivery of the action by that Council and P = partnership arrangement for delivery, usually between LGA and MCMC. Overall Notional Cost = combined notional cost of action for accountable parties. N/A = column heading is not applicable. Priority = the agreed priority attached to the action by the steering committee for the Strategy, which may differ from individual agency's timeframes for commencement of implementation of the action due to an agency's budgetary processes.

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Cord'n Req'd	Overall Notional Cost	Priority
HTC1	Establish a working group of local government strategic planning and conservation officers to work with Department of Infrastructure (DI) to determine planning measures and other mechanisms for identification and protection of significant sites and habitat links for the reach.	DI, Hume, Whittlesea, DNRE, MW	MCMC	✓	$	High
HTC2	Implement a Stream Frontage Management Program for the reach focussing on priority sites (Hernes Swamp, Bald Hill, Kalkallo to Craigieburn) to assist land owners to protect creek frontages.	MW	Hume, Whittlesea, DNRE, MCMC		$$	High
HTC3	Develop recommendations for further action through undertaking a short feasibility study of the Hernes Swamp area (as defined by Schulz and Webster), to determine measures able to be implemented to return the site to a more natural marshy herbfield condition, protect significant flora and fauna, and to improve the water quality of Merri Creek.	MW	DNRE, MCMC		$	Medium

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Cord'n Req'd	Overall Notional Cost	Priority
HTC4	Continue negotiations to develop a site management plan for future quarrying at Bald Hill so that: • important grassland areas might be conserved; • populations of *Carex tasmanica* maintained; • fencing undertaken; • habitat of Grassland Earless Dragon preserved; and • creek water quality and Blackfish populations protected.	DNRE, Mitchell, Whittlesea, DI	MCMC, VNPA, MW, Boral		$	High
HTC5	Undertake further survey work at Kalkallo Common to assess its regional biological and habitat link significance	DNRE	Hume MCMC		$$	High
HTC6	Ensure in the preparation of Local Structure Plans for developable land between Hume Highway and Merri Creek that impacts of development on significant sites and the stream environment are addressed	Hume	MCMC, MW	✓	$$	High
HTC7	Investigate appropriate planning controls to prevent rock removal from sites of regional faunal significance and above as mapped by Schulz and Webster (1991) and Beardsell (1997) and refer the matter to the forum established under HTC1	Whittlesea, Hume	MCMC	✓	$	High
HTC8	Investigate development of financial incentive schemes for sympathetic land management which helps preserve flora and fauna values, especially on sites of significance	Hume	DNRE, MCMC	✓	$$	High
HTC9	Investigate a wider application of rate incentive schemes for sympathetic land management to help preserve flora and fauna values	Whittlesea, Hume	MCMC		$$	High
HTC10	Promote Landcare and Land for Wildlife programs to rural landholders within the reach to provide improved protection of stream and other habitats and significant flora and fauna species	DNRE	Hume, Whittlesea, MCMC		$	Medium

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Cord'n Req'd	Overall Notional Cost	Priority
HTC11	Continue negotiations with land owners at Mt. Ridley to secure protection of significant grassland and habitat areas	Hume, DNRE	MCMC, VNPA		$	High
HTC12	Plan and implement the development of a habitat corridor along Malcolm Creek between Mt. Ridley and Merri Creek through the use of means including preparation of Local Structure Plans for the Craigieburn area	Hume	MCMC, MW		$$$	High
HTC13	Implement relevant recommendations of the Melbourne Water Drainage Scheme for Malcolm Creek which impact upon development of a habitat corridor for Malcolm Creek	MW	Hume, MCMC		$$	High

HEADWATERS TO CRAIGIEBURN ROAD EAST
FLORA, FAUNA, OPEN SPACE
Actions for Section 2.1

HTC1 Establish a working group of local government strategic planning and conservation officers to work with Department of Infrastructure (DoI) to determine planning measures and other mechanisms for identification and protection of significant sites and habitat links for the reach

HTC2 Implement a Stream Frontage Management Program for the reach focussing on priority sites (Hernes Swamp, Bald Hill, Kalkallo to Craigieburn) to assist land owners to protect creek frontages

HTC3 Develop recommendations for further action through undertaking a short feasability study of the Hernes Swamp area (as defined by Schulz and Webster), to determine measures able to be implemented to return the site to a more natural marshy herbfield condition, protect significant flora and fauna, and to improve the water quality of Merri Creek

HTC4 Continue negotiations to develop a site management plan for future quarrying at Bald Hill so that:

- important grassland areas might be conserved;
- populations of Carex tasmanica maintained;
- fencing undertaken;
- habitat of Grassland Earless Dragon preserved; and
- creek water quality and Blackfish populations protected

HTC5 Undertake further survey work at Kalkallo Common to assess its regional biological and habitat link significance

HTC6 Ensure in the prepartion of Local Structure Plans for developable land between Hume Highway and Merri Creek that impacts of development on significant sites and the stream environment are addressed

HTC7 Investigate appropriate planning controls to prevent rock removal from sites of regional faunal significance and above as mapped by Schulz and Webster (1991) and Beardsell (1997) and refer the matter to the forum established under HTC1

HTC8 Investigate development of financial incentive schemes for sympathetic land management which helps preserve flora and fauna values, especially on sites of significance

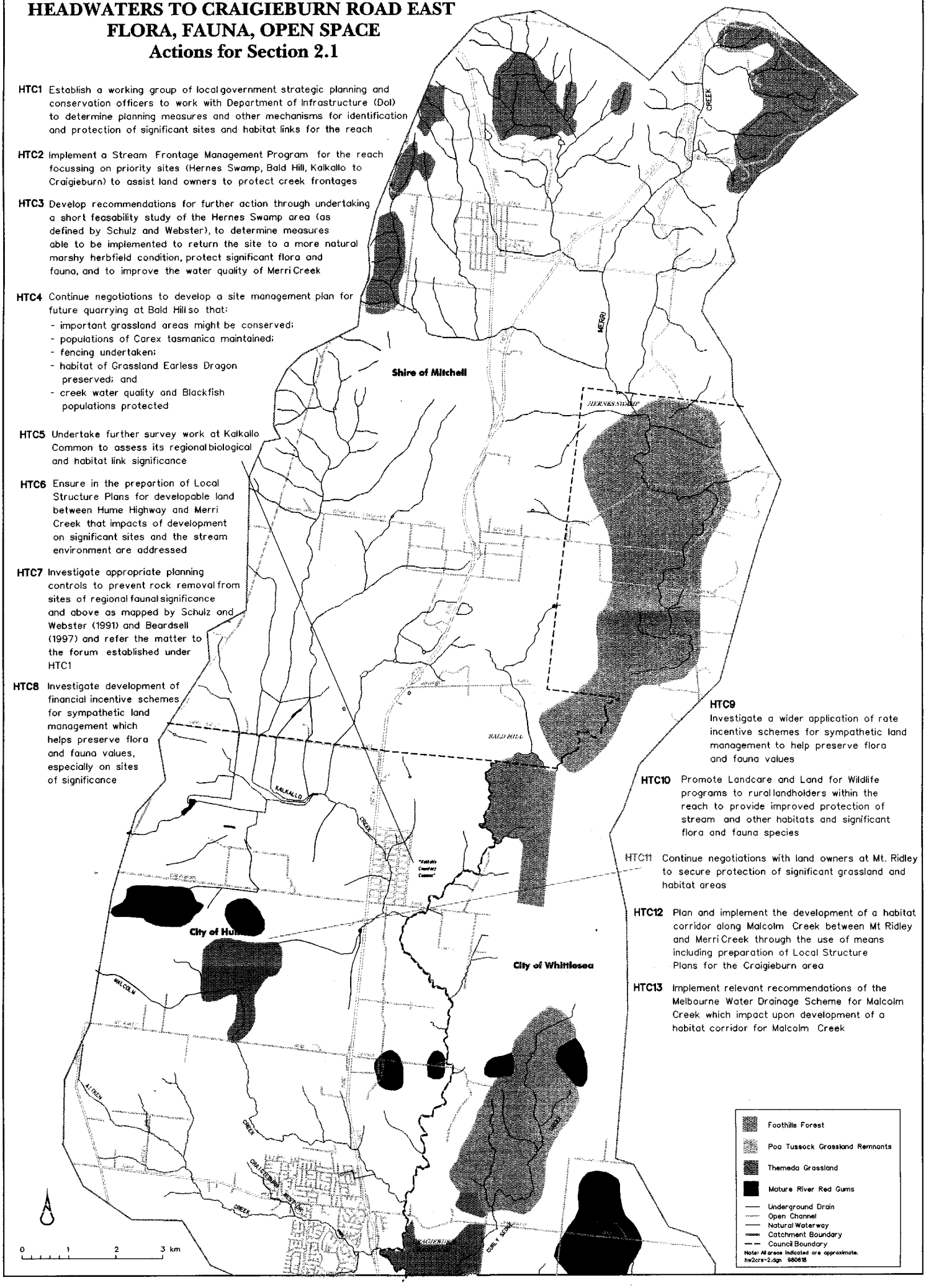
HTC9 Investigate a wider application of rate incentive schemes for sympathetic land management to help preserve flora and fauna values

HTC10 Promote Landcare and Land for Wildlife programs to rural landholders within the reach to provide improved protection of stream and other habitats and significant flora and fauna species

HTC11 Continue negotiations with land owners at Mt. Ridley to secure protection of significant grassland and habitat areas

HTC12 Plan and implement the development of a habitat corridor along Malcolm Creek between Mt Ridley and Merri Creek through the use of means including preparation of Local Structure Plans for the Craigieburn area

HTC13 Implement relevant recommendations of the Melbourne Water Drainage Scheme for Malcolm Creek which impact upon development of a habitat corridor for Malcolm Creek



2.2 Craigieburn Road East to Mahoneys Road

Background

There are a number of significant flora and fauna sites within the reach which have been documented through a host of studies over the last decade (see for example DCE, 1990; Schulz and Webster, 1991; Frood, 1992; Ecological Horticulture, 1993; Peake et. al., 1996; Beardsell, 1997). The significance of these sites has resulted in various moves to ensure their conservation. The initiatives taken by the Department of Natural Resources and Environment (DNRE) in this regard have been outlined above in the Introduction to this Section.

Being on the existing urban fringe and part of an area identified for future urban and employment growth (see exhibited Hume City Council Planning Scheme, 1997), the lands of this reach are exposed to many potential impacts as Melbourne's development proceeds north into the Merri Growth Corridor. Impacts can range from:

- the expansion of commercial and industrial premises into areas of remnant vegetation;
- increased disturbance of soils; and the consequent spread of weeds such as the highly invasive and persistent Chilean Needle-grass and Serrated Tussock; and
- rock removal from paddocks causing depletion of fauna habitat.

A further example is expansion of the road network, and in the case of this particular reach, this applies especially to the proposed Hume Freeway.

Depending upon the route eventually chosen for the Freeway, it has the potential to impact on a range of stream and terrestrial values throughout the reach. The existing reservation for the Freeway crosses the Merri Creek three times, and Malcolm and Central Creeks once from its origins at Craigieburn until it joins the Metropolitan Ring Road just north of Mahoneys Road in Thomastown. Along this route the reservation bisects the Craigieburn Grassland, runs through the area of remnant grassland at Cooper Street and is located on the eastern edge of Galada Tamboore.

It is the Freeway reservation's interference with the Craigieburn Grassland which has caused a Ministerial Advisory Committee to be set up to examine alternative route options. This was deemed necessary due to the Government's desire to reserve the Craigieburn Grasslands without encumbrance (see VicRoads, 1998).

VicRoads have prepared preliminary information for the Advisory Committee including the identification of seven different route options. These route options are described below and shown on the map following page 48.

- **Option 1** - Commencing at much the same point on the Hume Freeway as the existing reservation and intruding into the north-east corner, yet generally skirting the eastern side of the Craigieburn Grasslands. Then paralleling the eastern boundary of the Grassland and crossing O'Herns Road to the east of O'Herns Wetland. Rejoining the existing reservation immediately above Cooper Street.

- **Option 2** - As above from the Hume Freeway to the north-east corner of the Craigieburn Grasslands from where the route takes a much more easterly alignment before crossing O'Herns Road to the east of proposed quarries and some 2.5kms further east of the above option. North of Cooper Street the route would traverse areas intended for development. Then travelling in a south-westerly direction across the Lalor Golf Course and the Whittlesea Public Gardens before rejoining the existing reservation below Barry Road.

- **Option 3** - Again to the north-east corner of the Craigieburn Grasslands from where the route takes a straight-line route south-south east through working and closed quarries south of O'Herns Road and south of Cooper Street on the east side of Merri Creek. Then rejoining the existing reservation south of Barry Road.

- **Option 4** - A new route exiting the Hume Freeway some 2-3 kms. north of the current reservation and then travelling in an east then south-east direction to skirt the Nubrick quarry. Then generally south to rejoin the route of Option 1 near Harvest Home Road to the east of the Craigieburn Grasslands.

- **Option 5** - The same route as Option 4 to halfway along the Nubrick property where the route continues in straight line to connect with Option 2 north of O'Herns Road.

- **Option 6** - an upgrade of the existing Hume Highway with a number of different proposals being investigated. These range from: comparatively minor upgrading; to construction of a full freeway at grade or on structure; or freeway construction from Craigieburn to Cooper Street, then use of the existing reservation to the Ring Road.

- **Option 7** - the E14 route - utilising a route mostly set aside for an expressway (arterial road) on the west side of Craigieburn and subsequently within the Yuroke Creek valley and joining the Metropolitan Ring Road immediately west of the Jacana Retarding Basin site on Moonee Ponds Creek.

The Advisory Committee will make a recommendation to the Minister regarding a preferred route following hearings in 1999.

Some further details concerning the significant features of the reach are set out under five sub-headings as follows.

(i) Craigieburn Grasslands

The Craigieburn grassland covers an area of approximately 400 hectares between Craigieburn Road East and Cooper Street, although parts of the area have little or no significance including a quarry, house and improved pasture (see map appended to Schulz and Webster, 1991). The Craigieburn grassland was first reported on in 1990 (DCE, 1990) and has six key vegetation communities ranging from Plains Grassland to *Danthonia* Grassland and Stony Knoll Grassland (Ecological Horticulture, 1993). The site has been assigned National significance for flora (DCE, 1990; Frood, 1992; Ecological Horticulture, 1993; Ecology Australia, 1996; Beardsell, 1997) due mainly to the presence of *Carex tasmanica, Dianella amoena* and *Amphibromus pithogastris*.

The Craigieburn habitat of *Amphibromus pithogastris* is likely to be critical habitat. This is also likely to be the case for *Carex tasmanica* (Ecology Australia, 1996). There are 10 State significant plant taxa and 114 regionally significant taxa at Craigieburn (Ecology Australia, 1996).

The Craigieburn Grassland has also been assigned National significance for fauna due to presence of Striped Legless Lizard and Plains-wanderer (Beardsell, 1997). It also has three State significant species (Black Falcon, Red-Chested Button-quail and Freshwater Blackfish), as well as 27 regionally significant species (Ecology Australia, 1996). In relation to the Grassland Earless Dragon, while it has not been recorded at the Craigieburn site, it may occur there, as relatively large areas of apparently suitable habitat are available. These include the bases of Stony Knolls, especially near the top of the Merri Creek escarpment. Given the extent of potentially suitable habitat, the site could prove to be one of the most important sites for this species in Victoria (Ecology Australia, 1996).

Merri Creek provides a key element of the Craigieburn site and the riparian and escarpment vegetation are of high quality. The creek corridor forms an important habitat link with sites such as Cooper Street to the south and Bald Hill to the north and is an especially important link for ground mammals. According to Beardsell, "the presence of the locally rare Common Wombat and Black Wallaby (not known from closer in along Merri Creek), suggests it acts as a faunal corridor" (Beardsell, 1997, Vol. 2, p. 79 Print Version of CD). Beardsell further identified the Craigieburn Grassland as pivotal to strategic habitat links between the Merri and Plenty systems (see Beardsell, 1997, Strategic Habitat Link Network map).

The Merri Creek through this reach contains fast-flowing riffle sections of basalt cobbles and tessellated pavement, slow-flowing open water, reedy pools and a shallow gorge with columnar basalt cliffs and boulder screes and escarpments (Schulz and Webster, 1991). Future management of the stream frontage will need to take account of these values.

Beardsell described the Craigieburn Grassland and O'Herns Road Wetland as "the most extensive, intact, rare, diverse and significant volcanic plains rocky grassland, stream and wetland flora and fauna assemblage in Greater Melbourne.....No biological reserve containing both of these systems is in existence" (Beardsell, 1997, p. 2, Appendix 2.1 to Vol. 2, Table of Contents Version of CD).

The Victorian Government has a stated policy to acquire the Craigieburn property and move the freeway reservation to the eastern boundary and create the Craigieburn Flora and Fauna Reserve (Victorian Liberal Party, 1996).

There are a number of specific issues associated with the site. Grazing needs to be managed to protect the range of grassland values, including rare plants, stony knolls and riparian verges.

(ii) Cooper Street Grassland

An extensive native grassland remnant occupies lands south of Cooper Street, Campbellfield on the west side of Merri Creek. The grassland extends some 1.5 kilometres south from Cooper Street and west from Merri Creek to factories along Rex and Northbourne Roads. It has Kangaroo Plains grassland and a relatively intact Brown-back Wallaby-grass seasonal wetland.

Twenty-three hectares of the grassland has been purchased for a reserve and is owned by Parks Victoria. To the east is a strip of Creek frontage owned by the Istra Social Club. The current F2 Freeway reservation takes up another linear strip along the western portion of the site, while the balance of the site is privately owned. Part of the private land has is actively used for industrial purposes.

The Cooper Street site has been determined as having State to National significance for its flora and fauna (Ecological Horticulture, 1993) and has Plains Grassland, Escarpment Shrubland and Riparian Scrub (see Stuwe, 1986; Cheal, 1988; DCE 1990; Frood, 1992; and Beardsell, 1997). The Woolly Tea-tree riparian scrub, along with the stand at the Craigieburn Grassland, is considered to be the most intact in North-East Melbourne (Beardsell, 1997, Vol. 2, p. 65 Print Version of CD). The endangered *Amphibromus pithogastris* is also present at the site, along with the rare species *Agrostis aemula* var. *setifolia.*

In terms of fauna, the Cooper Street site is considered to be of State significance due to the presence of Striped Legless Lizard. Other reptile species recorded at Cooper Street include at least four species of snakes and seven species of skinks and lizards. A Common Long-necked Tortoise was also found in a creek pool in 1988 (Beardsell, 1997, Vol. 2, p. 67 Print Version of CD).

A number of regionally significant bird (including Swift Parrot) species have been recorded at the site (Beardsell, 1997, Vol. 2, p. 65-6 Print Version of CD).

The Cooper Street site serves as an important element in habitat connectivity for the region, being mid-way between the Craigieburn Grasslands and the Galada Tamboore sites and therefore having a connection to a strategic habitat link between the Merri and Plenty systems (see Beardsell, 1997, Strategic Habitat Link Network map).

The integrity of the Cooper Street site has been under pressure through horse and cattle grazing and the use of a part of the site for industrial purposes. The site has also had a high incidence of uncontrolled summer grassfires over the last decade. This poses a threat to some species of flora and fauna (including the Striped Legless Lizard in large fires), killing some Black Wattles and possibly depleting their soil store of seed (Beardsell, 1997, Vol. 2, p. 69, Print Version of CD).

From the late 1980s, the Friends of Merri Creek, and more recently the MCMC, have been active in efforts to conserve the Cooper Street Grassland.

(iii) Barry Road to Horne Street, including Galada Tamboore

This site can be considered to cover an area of land approximately from Barry Road to Horne Street. Immediately on the north side of Barry Road an area of industrial land (the former Night Soil depot) has recently been prepared for sale and development. A reserve area along the creek frontage has been created, part of which will be owned by Melbourne Water and part by Hume Council.

Elsewhere throughout the reach, the land has a variety of owners. Hume Council own land on the west side of Merri Creek at the Hatty Court and Bambury Court Reserves. Apart from the Hume Freeway Reservation owned by VicRoads, the most significant parcel of land is the 93 hectare Melbourne Water retarding basin site which extends from just north of Barry Road to downstream of Horne Street and includes land on both sides of the stream. This land was purchased in the 1970s to permit retardation of flood waters. As part of Melbourne Water's Future Directions Plan for the site (for details see below), the Campbellfield Retarding Basin has experienced a change of name sanctioned through the Place Names Committee. It is now known as Galada Tamboore from the Aboriginal name meaning creek waterhole.

Issues

- The current reserved alignment of the proposed F2 Freeway from Craigieburn to the Metropolitan Ring Road crosses most sites of State and National significance within the reach.
- The current Hume Highway is a barrier to fauna movement in a westerly direction from the Merri system and opportunities exist for protection and enhancement of habitat links east to adjacent waterway systems.
- Some areas in private ownership could be effectively protected through programs promoting sympathetic management.
- Parts of the creek frontage which have adjacent industrial uses (eg. Rushwood Drive, Dunlop Olympic, the Victorian Transport Centre and the Mason Street Industrial Estate) will provide a challenge for the development of linked open space along the waterway corridor. Developer Guidelines for industrial areas are required to assist this process (see also Section 5.1).
- The reach is comparatively rich in Aboriginal archaeological sites and these require protection from disturbance.
- Parts of the reach are currently being degraded by weed invasion, rubbish dumping, illegal vehicle access or inadequate management.

Objectives

- The conservation of areas identified as being of National or State significance for flora, fauna, geology and geomorphology and archaeology.
- Establishment of the Craigieburn Flora and Fauna Reserve.
- Protection of archaeological and Aboriginal cultural sites.
- Provision of recreation opportunities which are compatible with, and highlight the conservation and Aboriginal cultural heritage values, of the sites within the reach.
- Preservation of the flood retention and water quality treatment capability of the Campbellfield Retarding Basin.
- Cooperative and sympathetic management by private landholders of stream frontages and other lands to complement protection of significant sites of the reach.
- Protection and consolidation of an open space and access linkage between the Metropolitan Ring Road and Horne Street.
- Provision for continuous access along the reach corridor (see further Section 4.2)
- Provision for an open space corridor supporting flora and fauna habitat.
- Achievement where possible, of softening of interfaces between industrial/residential areas and waterway and open space areas (see also Section 1.3).

Action Program **Note:** * in accountable SA (Statutory Authority) or LGA (Local Government Authority) column = MCMC assigned responsibility for delivery of the action by that Council and P = partnership arrangement for delivery, usually between LGA and MCMC. Overall Notional Cost = combined notional cost of action for accountable parties. N/A = column heading is not applicable. Priority = the agreed priority attached to the action by the steering committee for the Strategy, which may differ from individual agency's timeframes for commencement of implementation of the action due to an agency's budgetary processes.

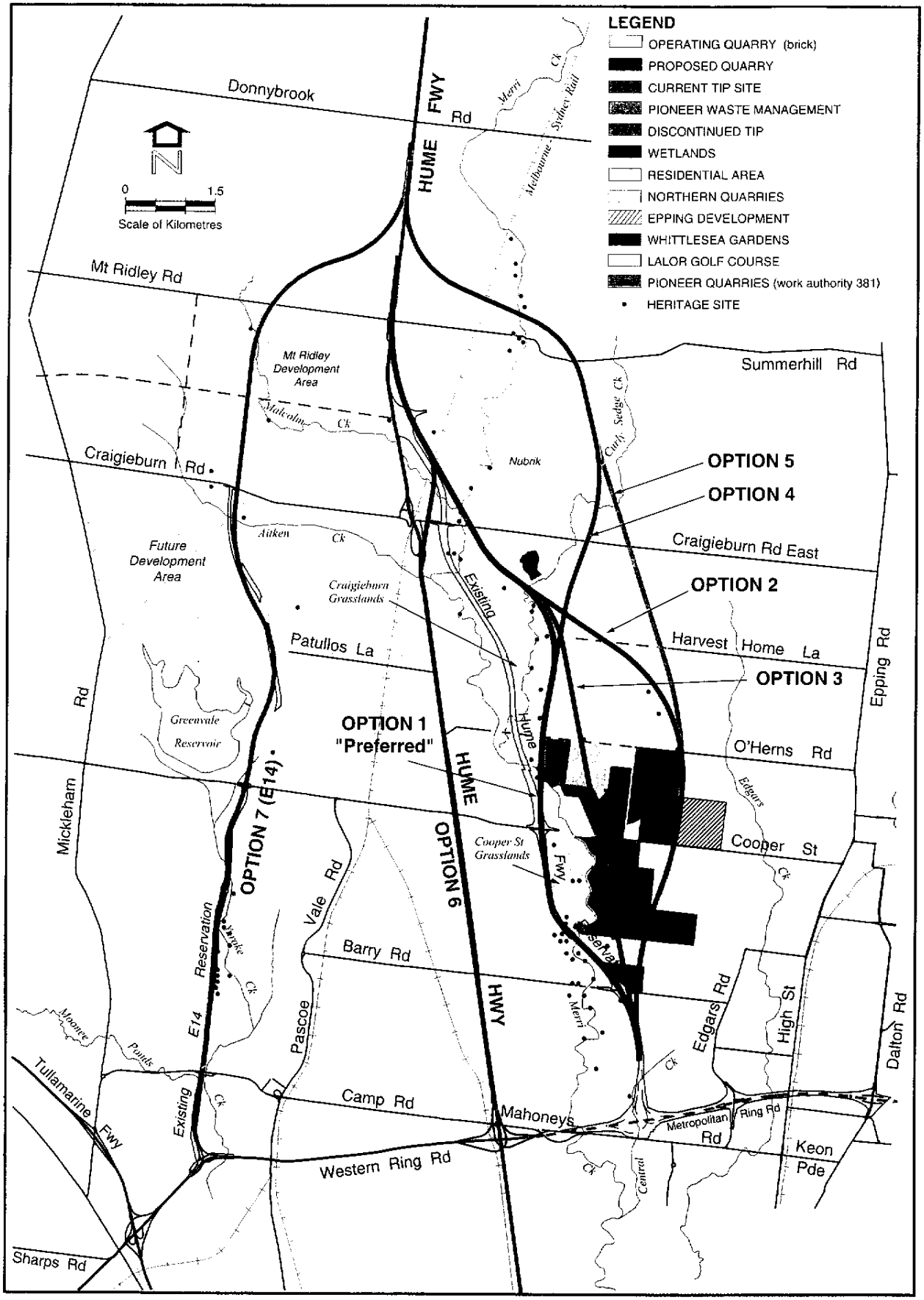
CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Cord'n Req'd	Overall Notional Cost	Priority
CTM1	Review documentation (including the NEROC Study - Beardsell, 1997) which identifies significant biological values for this reach of Merri Creek and its tributaries, and develop an action program for protection of these sites and habitat links between them	DNRE, Hume, Whittlesea	MCMC	✓	$$	High

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Cord'n Req'd	Overall Notional Cost	Priority
CTM2	Investigate opportunities for additional flora and fauna habitat links utilising open space and other public lands along this reach of the Merri Creek corridor	Whittlesea, Hume	MCMC DNRE	✓	$	High
CTM3	Examine open space needs along this reach of the Merri Creek and develop strategies for its consolidation and development	Whittlesea, Hume	MCMC	✓	$$	High
CTM4	Investigate opportunities to obtain an open space access link through this reach of the Merri Creek corridor	Whittlesea, Hume	MCMC	✓	$	High
CTM5	As development proceeds, seek opportunities to reserve open space along the creek within this reach of the Merri Creek corridor and its tributaries	Whittlesea, Hume	MCMC		$	High
CTM6	Undertake conservation and protection works for archaeological relics within existing public land	MW, Hume, Whittlesea	AAV, WTLCCHC MCMC		$$	High
CTM7	Continue to negotiate for return of the Istra Club creek frontage land to public ownership	Hume	MCMC, PV		$$	High
CTM8	Promote the development of a management plan for the 23 hectare Cooper Street grassland reserve to facilitate its future management	PV	MCMC, Hume		$$	High
CTM9	Investigate long-term strategies (including a review of setbacks, title and easement infringements and potential for some acquisitions) for key blocks along the Sarah Street frontage to the escarpment of the Merri Gorge area downstream of Barry Road	Hume	MW MCMC		$$	Low
CTM10	Continue to establish and maintain screen plantings below Sarah Street frontage to escarpment of Merri Gorge	Hume*	MCMC, FOMC		$$	High
CTM11	In line with recommendations of the Future Directions Plan, seek means to prevent unauthorised vehicle access to the Galada Tamboore site from external roads and other entry points as a key initial step in the site's management	MW, Whittlesea, Hume	MCMC		$$	High
CTM12	Implement other recommended actions arising from the Galada Tamboore Future Directions Plan (Melbourne Water, 1997)	MW	Whittlesea Hume MCMC		$$$	High

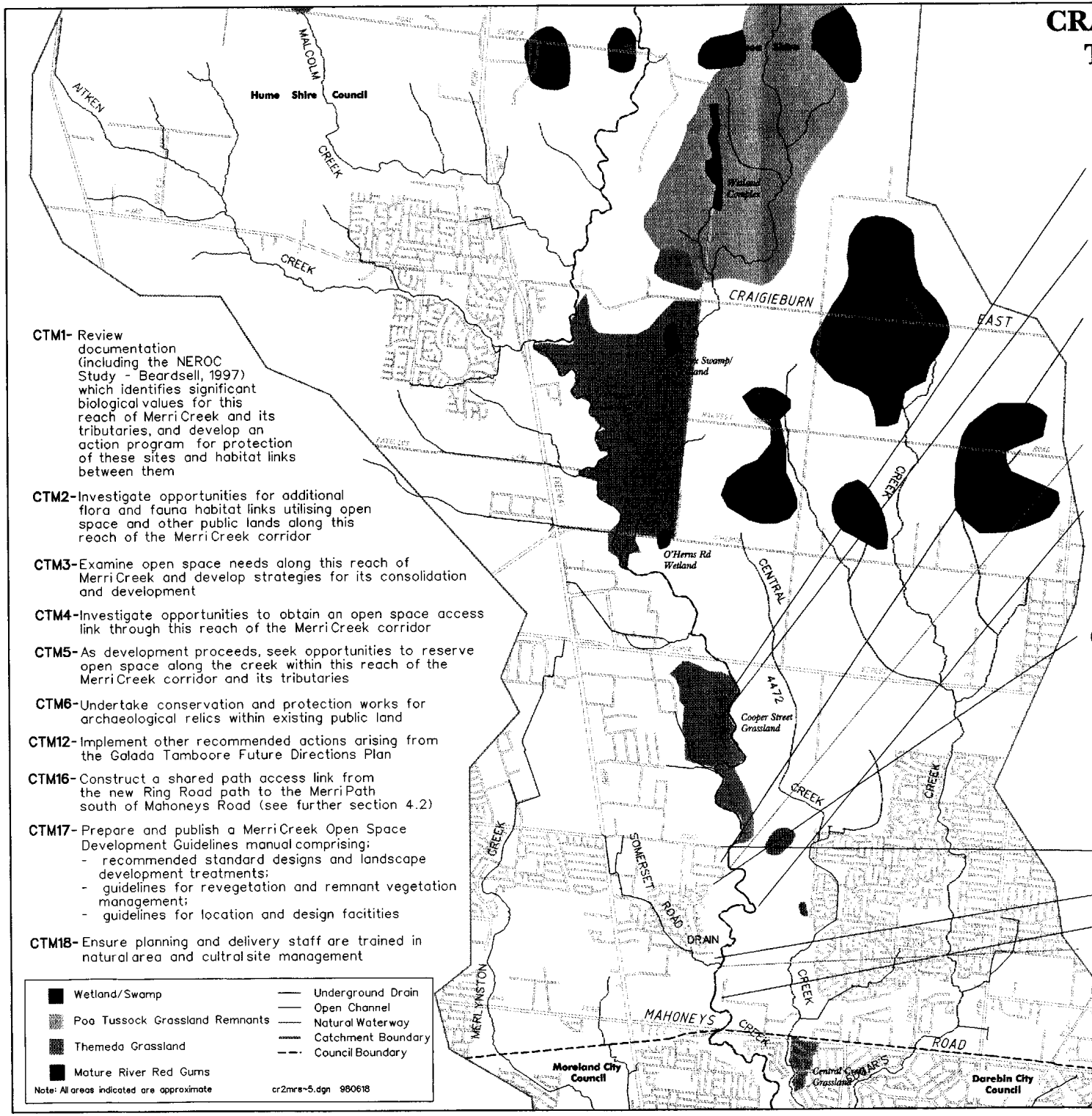
CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Cord'n Req'd	Overall Notional Cost	Priority
CTM13	Implement actions arising from the Hatty Court Reserve Concept Plan which seek to: protect archaeological sites from impacts associated with recreation provision; enhance indigenous vegetation cover; and involve local residents in the rehabilitation of waterway-related open space.	Hume	MCMC MW		$$	High
CTM14	Implement actions to prevent rubbish dumping at known problem spots within the reach: • end of Barry Road; • off Trawalla Avenue; and • Horne Street.	Hume, Whittlesea, MW	MCMC	✓	$	High
CTM15	Seek to retain the existing open channel status of the lower section of the Somerset Road Drain within any plans for the Campbellfield Landfill Disposal Site and investigate opportunities for sediment control and water quality improvement before entry to Merri Creek, especially as part of detailed planning for the retarding basin wall within Galada Tamboore.	MW	Hume MCMC		$	High
CTM16	Construct a shared path access link from the new Ring Road path to the Merri Path south of Mahoneys Road (see further section 4.2)	VicRoads	MCMC		$$	High
CTM17 *(see also MTY11)*	Prepare and publish a Merri Creek Open Space Development Guidelines manual comprising: • recommended standard designs and landscape development treatments; • guidelines for revegetation and remnant vegetation management; • guidelines for location and design of facilities	Whittlesea*, Hume*	MCMC	✓	$$	High
CTM18 *(see also MTY12)*	Ensure planning and delivery staff are trained in natural area and cultural site management	Whittlesea*, Hume*	MCMC	✓	$$	High

Hume Freeway Route Options

(as proposed by VicRoads - Planning Assessment Report, October, 1998)



CRAIGIEBURN ROAD EAST TO MAHONEYS ROAD
Action for Section 2.2



CTM1- Review documentation (including the NEROC Study - Beardsell, 1997) which identifies significant biological values for this reach of Merri Creek and its tributaries, and develop an action program for protection of these sites and habitat links between them

CTM2- Investigate opportunities for additional flora and fauna habitat links utilising open space and other public lands along this reach of the Merri Creek corridor

CTM3- Examine open space needs along this reach of Merri Creek and develop strategies for its consolidation and development

CTM4- Investigate opportunities to obtain an open space access link through this reach of the Merri Creek corridor

CTM5- As development proceeds, seek opportunities to reserve open space along the creek within this reach of the Merri Creek corridor and its tributaries

CTM6- Undertake conservation and protection works for archaeological relics within existing public land

CTM12- Implement other recommended actions arising from the Galada Tamboore Future Directions Plan

CTM16- Construct a shared path access link from the new Ring Road path to the Merri Path south of Mahoneys Road (see further section 4.2)

CTM17- Prepare and publish a Merri Creek Open Space Development Guidelines manual comprising:
- recommended standard designs and landscape development treatments;
- guidelines for revegetation and remnant vegetation management;
- guidelines for location and design facitities

CTM18- Ensure planning and delivery staff are trained in natural area and cultral site management

Wetland/Swamp
Poa Tussock Grassland Remnants
Themeda Grassland
Mature River Red Gums

Underground Drain
Open Channel
Natural Waterway
Catchment Boundary
Council Boundary

Note: All areas indicated are approximate

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CTM7 - Continue to negotiate for return of the Istra Club creek frontage land to public ownership

CTM8 - Promote the development of a management plan for the 23 hectare Cooper Street grassland reserve to facilitate its future management

CTM9 - Investigate long-term strategies (including a review of setbacks, title and easement infringements and potential for some acquisitions) for key blocks along the Sarah Street frontage to the escarpment of the Merri Gorge area downstream of Barry Road

CTM10 - Continue to establish and maintain screen plantings below Sarah Street frontage to escarpment of Merri Gorge

CTM11 - In line with recommendations of the Future Directions Plan, seek means to prevent unauthorised vehicle access to the Galada Tamboore site from external roads and other entry points as a key initial step in the site's management

CTM13 - Implement actions arising from the Hatty Court Reserve Concept Plan which seek to: protect archaeological sites from impacts associated with recreation provision; enhance indigenous vegetation cover; and involve local residents in the rehabilitation of waterway-related open space

CTM14 - Implement actions to prevent rubbish dumping at known problem spots within the reach:
- end of Barry Road; and
- Horne Street
- off Tawalla Avenue

CTM15 - Seek to retain the existing open channel status of the lower section of the Somerset Road Drain within any plans for the Campbellfield Landfill Disposal Site and investigate opportunities for sediment control and water quality improvement before entry to Merri Creek, especially as a part of detailed planning for the retading basin wall within Galada Tamboore

2.3 Mahoneys Road to Yarra River

Introduction

Within the urbanised reaches of the Merri Creek corridor the ownership and nature of lands adjacent to the waterway varies significantly. Here the land is predominantly in public ownership with few, if any, old private freehold titles extending to the middle of the watercourse. Much of the adjacent land is often available for recreation purposes and with some exceptions, this land can be broadly considered as open space. Provided they are adequately connected, these lands can form an open space and flora and fauna habitat corridor.

There are numerous benefits which can accrue to people and the stream's ecosystem from an appropriately vegetated waterway open space corridor. Continuity of indigenous vegetation provides shade, food and nutrients, and a passage and home for wildlife. In a general sense, vegetation supplements the diverse physical structure of the corridor with, where there is an absence of channel amendment, its connected sites of rocky escarpments, stream pool and run formations and grassy plains. A well-vegetated and maintained open space corridor also provides a source of human recreation in a comparatively natural and often tranquil setting.

Besides a diversity of land ownership, the function of various parcels of land also changes based upon factors such as its zoning, overlays or the existence of easements. For instance, some lands along the creek will have a primary purpose for flood protection and may be zoned or be subject to overlay controls accordingly. Other lands will be located well away from the floodplain, be used as sporting fields and zoned as Public Park and Recreation under new Council Planning Schemes. In addition, due to the historic use of waterway corridors for installation of utility services, easements over lands along the waterway have also been created (eg. in favour of power companies such as GPU PowerNet).

However, while consideration of the detail of land ownership and zoning within this reach reveals a situation of diversity (even complexity), there has been some simplification of zonings and the addressing of some long-standing anomalies along Merri Creek with the development of new local government Planning Schemes. Beyond that, there is possibly little prospect of further simplification of ownership between the many Councils, agencies and others who hold land along the corridor. Emphasis therefore needs to be placed upon working within the constraints of multiple ownership and planning controls. A focus on achieving a consolidation of the open space and waterway corridor, known as the Merri Creek Parklands (see further below), is required.

However, it should also be noted that some land parcels may be subject to review for disposal or transfer at a time when they are no longer required for core activities of agencies. A thorough review of conservation and open space needs should accompany a rationalisation of land holdings affecting the corridor.

Background

In times prior to European settlement, Aboriginal communities appear to have been protective of the creek environment and its associated lands. The twentieth century though, has seen a host of different notions emerge about treatment of the creek corridor below Mahoneys Road. Few have been particularly favourable to preservation of the stream, its floodplain and lands, though some were no doubt well-intentioned.

In the early years of Melbourne's settlement, noxious industries were attracted to areas close to waterways in order that they might conveniently discharge their wastes to the streams. Their occupation of the lands near the creek set an unfortunate precedent for treatment of the stream corridor.

While effluent was poured into Merri Creek for many years as European settlement expanded north to areas such as Preston, some visionaries of the time persisted with ideas of using the creek as a municipal show-piece. One idea to emerge in the early years of the First World War, was the construction of a small lake at Northcote's gateway - presumably as a means to create some identity for this new municipality (Lemon, 1983). Though it was condemned at the time as "a menace to the health of the district", the lake idea persisted

until times following the sewering of the inner suburbs and the alleviation of many concerns about the creek's threat to public health.

The re-emergence of the lake concept came with the release of the Metropolitan Town Planning Commission's (MPTC) landmark report of 1929. This suggested boulevard roads along Melbourne's arterial waterways and the use of creek corridors to produce a system of radial "parks" for Melbourne. In the case of Merri Creek there was to be a lake north of Arthurton Road, "extending for nearly the whole distance between Beavers Road and Bell Street." (MTPC in Lemon, 1983, p. 210). The plan, incidentally, also showed a major area of open space on Merri Creek above Mahoneys Road.

While this grand metropolitan plan never came to fruition, due to its expense (over one million pounds), and then the onset of the Great Depression and the Second World War, a smaller lake on Merri Creek was finally constructed with the development of the Coburg Lake during the Depression years.

While the early and middle decades of the twentieth century was clearly a time of isolated "gardenesque" treatments of the creek corridor, the last two decades has seen a concerted effort to consolidate an open space corridor and to replicate and rehabilitate the valley's original vegetation cover.

Confirmation of this came with the coining of the term "Merri Creek Parklands" by the Merri Creek Bicentennial Committee in 1987. The phrase was thought necessary to provide an identity for the waterway's diverse and, even then, still disparate open space. Its adoption was thought desirable to assist with efforts to achieve recognition of the emerging value to the community of the creek's open space and to encourage its protection. The adoption of the term was also an outcome of the MMBW's new-found commitment to waterway open space management. This became one of the MMBW's responsibilities in the mid 1980s. It ceased to be a responsibility of Melbourne Water's in 1993 with the formation of Melbourne Parks and Waterways (now Parks Victoria).

However, there can be little doubt that the efforts of the last decade or more to consolidate and extend the creek's open space have produced significant results. Two sections of F2 freeway reservation (south of Bell Street and later Mahoneys Road to Bell Street) have been deleted. Much of this land, especially south of Bell Street, has resumed an open space status. Councils have also gradually acquired parcels of land where opportunities arose or where lack of connection between open space areas made acquisition an imperative.

In addition, increased amounts of land owned by public authorities have become available, through a variety of means, for recreational use. These lands sometimes have a primary purpose for flood mitigation. More notable examples in this regard are the former MMBW storeyard at Winifred Street Northcote and land in the Strettle Reserve/Anderson Road area of Thornbury.

However, perhaps the most significant change to the lands of the creek corridor over the last decade has been the vast improvement in its vegetation cover. This has been brought about by many years of revegetation works, primarily through the Merri Creek Management Committee's works capacity and Council efforts supported by the former MMBW and now Melbourne Water. Control of prolific weed species has also been a noticeable development during that time. Areas which were inaccessible and weed-infested wastelands as recently as the early 1980s (eg. between High Street and Rushall Station, as well as many others) have become a frequently-used natural resource for the community.

Impetus for Council investment in the open space of the creek corridor - a trend which gained momentum from the late 1970s - was in part a result of their recognition of the relative open space deprivation of inner urban areas (see Ministry for Planning and Environment, 1988). Especially in the old municipalities of Fitzroy and Brunswick, the creek corridor provided one of the few opportunities for an effective increase in the open space provision of those municipalities. An even smaller proportion of the open space of these areas was available for passive recreation pursuits. As municipal recreation and other studies (eg. Morris, 1976) of the 1970s and 80s demonstrated, traditional municipal open space usage patterns tended to persist with a strong bias towards provision of playing fields and active recreation facilities.

Opening up of the creek corridor through the provision of bicycle and walking paths, weed control and extensive revegetation have transformed many areas into available and useable open space with a primarily passive recreation focus.

Plans and Guidelines

(i) Primary Node Plans

In order for improvements to open space to continue, the development of plans and guidelines are necessary to ensure priority issues are addressed and resources allocated on a consistent basis. In this regard, node or location plans are important mechanisms for planning the future development and management of sectors of the creek's open space.

This exercise takes on greater importance in areas where past land development has reduced available open space. Along Merri Creek there are a number of sites where land uses intrude into the physical or visual environment of the corridor, exercising undue constraint on the streamside environment. This is usually a legacy of permitting residential or industrial development to back onto, and be constructed within, the viewshed of the creek valley. In many cases, especially where the land is used for residential purposes, the possibility of regaining land is unlikely. In these circumstances there is little choice but to acknowledge that there will not always be a uniform or adequate open space corridor within each reach of the corridor. In these circumstances, the focus instead should be on securing some linking lands between "nodal" areas of significant open space, so that there might be an overall consolidation of the open space corridor.

A key short term task will therefore be the development of plans for primary nodal points along the stream where significant areas of open space can be achieved and developed in the near term.

In some cases the Node Plans might tend to have more of a management orientation focussing on issues to do with maintenance of sites which have already been subject to development works. In other cases Node Plans will provide an opportunity to focus on degraded or undeveloped areas which have received little previous attention. In this case they might be known as Development Plans. A Node Plan of this type has recently been completed by Moreland and Darebin Councils for Moomba Park and adjacent areas in Fawkner and Reservoir.

While some undeveloped areas might be found among the list of primary node plan sites, more will be found on the secondary sites list (see action table below).

In their preparation, Node Plans will derive guidance from suggested broad treatments of reaches of waterway open space recommended in revisions being undertaken by Merri Creek Management Committee to the Merri Creek Plan (1987).

Ideally, nodal sites should cover an area spanning both sides of the creek and/or include some key open space reserves. This will create a larger planning and development impact, provide some possible economies of scale and permit Councils to work cooperatively to plan and resource development of open space on both sides of the stream. A list of sites recommended for development of Primary Node Plans is contained in the action tables.

(ii) Supplementary Linking Site Prescriptions

As mentioned above, urban land use and/or ownership has on occasions constrained the amount of open space available along Merri Creek. In these cases it will be necessary to treat such sites as providing a "linking" function between larger nodal points.

Within these linking sites, open space management efforts will concentrate on establishing or maintaining a satisfactory path link and undertaking revegetation to provide a habitat corridor.

Prescriptions to treat linking areas can be developed as a supplementary line of planning and will establish broad principles for initial management of these sometimes narrow bands of land.

(iii) Secondary Sites - Node Planning
Even after the completion of all Primary Node Plans, there will still be many kilometres of land adjacent to the creek requiring rehabilitation.

As nominated Primary Node Plans are completed, it is recommended that sites from the secondary list be investigated for the development of Node Plans. This does not preclude secondary sites from works prior to development of nodal plans if responsible agencies choose to direct resources to a certain location or unanticipated funding or other opportunities arise.

The secondary sites are listed in the action tables. Emphasis has again been placed upon identifying significant tracts of open space spanning both sides of the stream.

(iv) Guidelines
Equally important in securing a more cooperative and unified approach to treatment of the Merri Creek Parklands will be the development of guidelines for rehabilitation and open space management. The guidelines will focus on open space development methods and techniques and will be quite different from the revisions of the Merri Creek Plan (1987), referred to previously.

In the past, development of areas of open space along the corridor have tended to be performed in a disparate manner without thought being given to creating a more uniform vegetation design. This was most clearly apparent in Coburg where, in a number of reserves tree species were used almost exclusively and planted in straight lines. This contrasts unfavourably with other areas of revegetation undertaken in recent times. Guidelines are therefore necessary to give the Merri Creek Parklands a sense of landscape and vegetation coherence, while still recognising a requirement to meet the needs and dictates of specific sites.

The Guidelines will provide a means to establish better collective understanding of the complexity of rehabilitating sites and the need to achieve continued improvement in management of sites by the various players responsible for delivery of works - be they Councils and their Parks business units or contractors, MCMC or others.

Future Opportunities

In order to examine opportunities for open space improvement, the Mahoneys Road to Yarra reach has been divided into two sections - upstream and downstream of Coburg Lake.

(i) Mahoneys Road to Coburg Lake
There are some significant opportunities to secure, add to, or improve the provision of open space from Mahoneys Road to Coburg Lake. In this reach, the Merri Path is often of an inferior standard and small sites of rare remnant native vegetation, and other areas, continue to be heavily infested with weeds.

Potential Sites for Future Rezoning
Opportunities for securing a more consolidated open space corridor within this reach are particularly associated with resolving ownership and zoning of lands along the former F2 freeway reservation. Moreland Council and MCMC has developed a proposal for securing land with residential and other zonings along the former freeway reservation. Besides the former freeway land, there are also issues associated with securing lands whose future has been clouded by the possibility of disposal by agencies deeming them surplus to their needs. This particularly applies to land purchased through the former Metropolitan Improvement Fund and now owned by Parks Victoria.

There is also a strip of industrial land in Fawkner which has been deemed inappropriate within the surrounding residential zoning. A recommendation has been made that it be re-zoned to Residential with future housing development to be encouraged to face the creek open space (Context Pty. Ltd., 1993).

There are a number of stretches within this reach where the valley is deeply incised and adjacent development (often factories), tend to be perched (some on fill pushed to the limits of the natural valley form), immediately adjacent to the break of slope. This means that the open space corridor is severely constrained. Given that it will possibly be many decades before there are rezonings of these industrial lands to residential uses - a likely prospect now though for some sites below Coburg Lake - it will be important to instead encourage greater vegetative cover and screening of developments which dominate views from the creek valley within this reach.

While there have been some success stories where owners have faithfully implemented conditions of permits and screening vegetation is established on slopes below factories, a number of areas are still deficient in this regard.

Such problems are particularly evident at the following locations within the reach:

- Brex Court, Reservoir;
- Edwardes Street, Reservoir.
- Newlands Road, North Coburg; and
- Acheson Place, North Coburg.

Remnant Vegetation Preservation

This reach of the creek supports occasional remnant trees, shrubs and ground flora. There are also two small remnant native grasslands areas of significance. Near Central Creek, Reservoir an area contains flora of State significance (Robinson and Duggan, 1994; Robinson and Morgan, 1997). The site has a diverse ownership split between VicRoads, Darebin Council and Parks Victoria and has been the subject of some management works by MCMC in recent years.

The second grassland site is at the end of Jukes Road in Fawkner and is owned by Parks Victoria. Its significance was first highlighted in a 1987 survey and report on its management (Robertson and Forbes, 1987). A more recent survey and site management report revealed that the grassland contains one plant species (*Dianella amoena*) considered to have national significance for conservation (Mueck, 1997). Overall the Jukes Road site is thought to have State to National significance (G. Carr, pers. comm.). Recent management works at the site (including fencing) have been carried out through funding supplied by Moreland Council. The preservation of remnants such as these two sites has long been recognised by the MCMC as forming a key component of their land management works.

There has also been some fauna survey work within this reach of Merri Creek. Regionally significant reptile species such as Large Striped Skink, Cunningham's Skink, Tussock Skink and Little Whip Snake have been found upstream of B. T. Connor Reserve in Reservoir. A Spotless Crake and Growling Grass Frog have also been found in the same vicinity (Beardsell, 1997, vol. 2, p. 54-5, Print Version of CD).

(ii) Coburg Lake to the Yarra

Despite the long history of urbanisation within this reach, its flora and fauna values should not be entirely discounted.

A more notable recent record of fauna was the taking of a Tupong during platypus survey work in the lower Edgars Creek in 1995. It has been argued that the construction of the fishway at Dights Falls may have facilitated the movement of this species into the catchment's streams (Beardsell, 1997, vol. 2, p. 56, Print Version of CD). Fish survey work from 1991 had also recorded Common Galaxias and Short-finned Eels during electrofishing from the Roseneath Street footbridge in Clifton Hill.

Notable reptile species observed during a short survey upstream of Queens Parade in 1991 included the Marbled Gecko, White's Skink, Bouganville's Skink, Weasel Skink and Southern Water Skink (Beardsell, 1997, vol. 2, p. 51, Print Version of CD).

One site which has been designated as having State significance for fauna is the section between High Street Northcote and the Yarra River (Ecological Horticulture, 1993). The assessment is based upon the presence of Large-footed Myotis roosting amongst the brickwork of the old Heidelberg Road bridge. This species is listed as rare in Victoria (Baker-Gabb 1991, in Ecological Horticulture, 1993). Beardsell also records a sighting of the same species roosting under the Queens Parade bridge in 1993 (Beardsell, 1997, vol. 2, p. 51, Print Version of CD).

The diversity of bird species has also increased with revegetation works in the reach over the last 15 years. Apart from Large-footed Myotis, notable species recorded include Blue-winged Parrot, Peregrine Falcon, White-winged Triller (Beardsell, 1997, vol. 2, p. 52, Print Version of CD). Another survey of the Northcote-Brunswick frontage to the creek in 1990 recorded a number of species which usually don't occur so close to the Melbourne CBD. Species included Rufous Night-heron, Sacred Kingfisher, Calmorous Reed Warbler, White-browned Scrubwren and Spotted Pardalote (Schulz, in Land Systems EBC, 1991, Appendix D).

There are also small areas of remnant vegetation at a number of sites including upstream of the Kendall Street, West Preston and near Cunningham Street, Northcote.

Perhaps the most remarkable feature of this urban reach has been the vast improvements to the extent and nature of open space over the last 15-20 years. Nevertheless, there are still many opportunities to be realised.

Potential Sites for Future Rezoning

Within the reach there are opportunities for additions to waterway open space where rezoning of industrial or other land arises through a proposed change of use. Sites where industry is located close to the stream and where it may be possible to derive a better eventual outcome for open space provision include:

- the Moreland City College frontage;
- Moreland Road, Coburg (Red Robin);
- Goldsmith Grove, Northcote;
- Elizabeth Street, Northcote;
- Cunningham Street, Northcote (Monumental Masons); and
- Creek Parade, Northcote.

The Moreland City College frontage has potential to be considered within plans for the broader Pentridge precinct and the changes of land use which will occur there in years to come.

The Pentridge site represents 35 ha. of public land which will be subject to redevelopment. Pentridge and its associated lands also has potential to achieve an addressing of Merri Creek and an increase in open space quantity and quality in the vicinity. New development should have an active and beneficial relationship to the creek. Orientation of development needs to be directed to the Merri Creek Parklands across well designed new roads. Collectively the Coburg Lake/Edgars Creek/Pentridge node requires a development plan which will achieve an overview of all open space in the area and its integration alongside development proposals.

Conclusion

While the list of primary and secondary nodal sites is daunting, a long term (30-50 year) perspective needs to be adopted for its implementation. Use of long-term perspectives can also assist with development of necessary visions and goals for rehabilitation of sites and can aid with the creation of long-term, comprehensive and gradual programs of restoration. Such an approach is preferable to "quick-fix" solutions developed to address immediate pressures. Hastily conceived plans for rehabilitation inevitably tend to produce less than optimal results. Many sites have a complex range of impacts and causes of degradation, which only comprehensive planning and consistent site management works will remedy.

In the meantime, it is also important not to neglect sites which have already been developed and revegetated. These sites are demanding of recurrent expenditure to adequately maintain them so that the initial investment is not jeopardised.

Issues

- An open space corridor with a sustainable vegetation cover and multiple habitat opportunities is required in order to provide benefit to the community and to the waterway ecosystem.

- Urban and industrial development has on occasions encroached into the stream valley making the provision of an open space corridor difficult.

- While much has been achieved during the last 15 years, there are still many decades of work to be done to control weed problems, revegetate areas and protect and extend the small remnants of indigenous vegetation within the Merri Creek Parklands. Agreement about priorities is an essential part of planning future development of open space.

- Mechanisms need to be introduced to ensure that open space lands and floodplains are protected in the long term from the effects of changing responsibilities of state agencies which own those lands.

- There is a lack of agreed open space development principles and design standards to ensure consistency of approach between Councils and others with open space delivery responsibilities.

- Where there are areas of private ownership of creek frontage it may often be necessary to negotiate improved management of those frontages.

Objectives

- A continuous open space corridor within this reach and more broadly from Craigieburn Road East to the Yarra River along both sides of the creek.

- Development of open space corridors along the main tributaries of the reach (Central Creek, Edgars Creek and Merlynston Creek) where opportunities permit.

- Consolidation of open space by:
  - using opportunities through statutory planning mechanisms;
  - negotiating agreements with landowners for sympathetic management of private frontages to the stream, lease of land for open space purposes or other arrangements which facilitate public access to private land forming stream frontages;
  - purchase or re-zoning, transferring or otherwise incorporating strategic parcels of government and private land into the Merri Creek Parklands.

- Adequate, strategically located open space appropriately zoned and treated in Planning Schemes (eg. as Urban Floodway or Land Subject to Inundation, Public Park and Recreation, or similar).

- Adequate open space associated with subdivisions and re-developments adjacent to the waterway and contributing to the Merri Creek Parklands.

- Sympathetic public works, private development and private land-use adjacent to the creek which aids the development of an open space corridor.

Action Program **Note:** * in accountable SA (Statutory Authority) or LGA (Local Government Authority) column = MCMC assigned responsibility for delivery of the action by that Council and P = partnership arrangement for delivery, usually between LGA and MCMC. Overall Notional Cost = combined notional cost of action for accountable parties. N/A = column heading is not applicable. Priority = the agreed priority attached to the action by the steering committee for the Strategy, which may differ from individual agency's timeframes for commencement of implementation of the action due to an agency's budgetary processes.

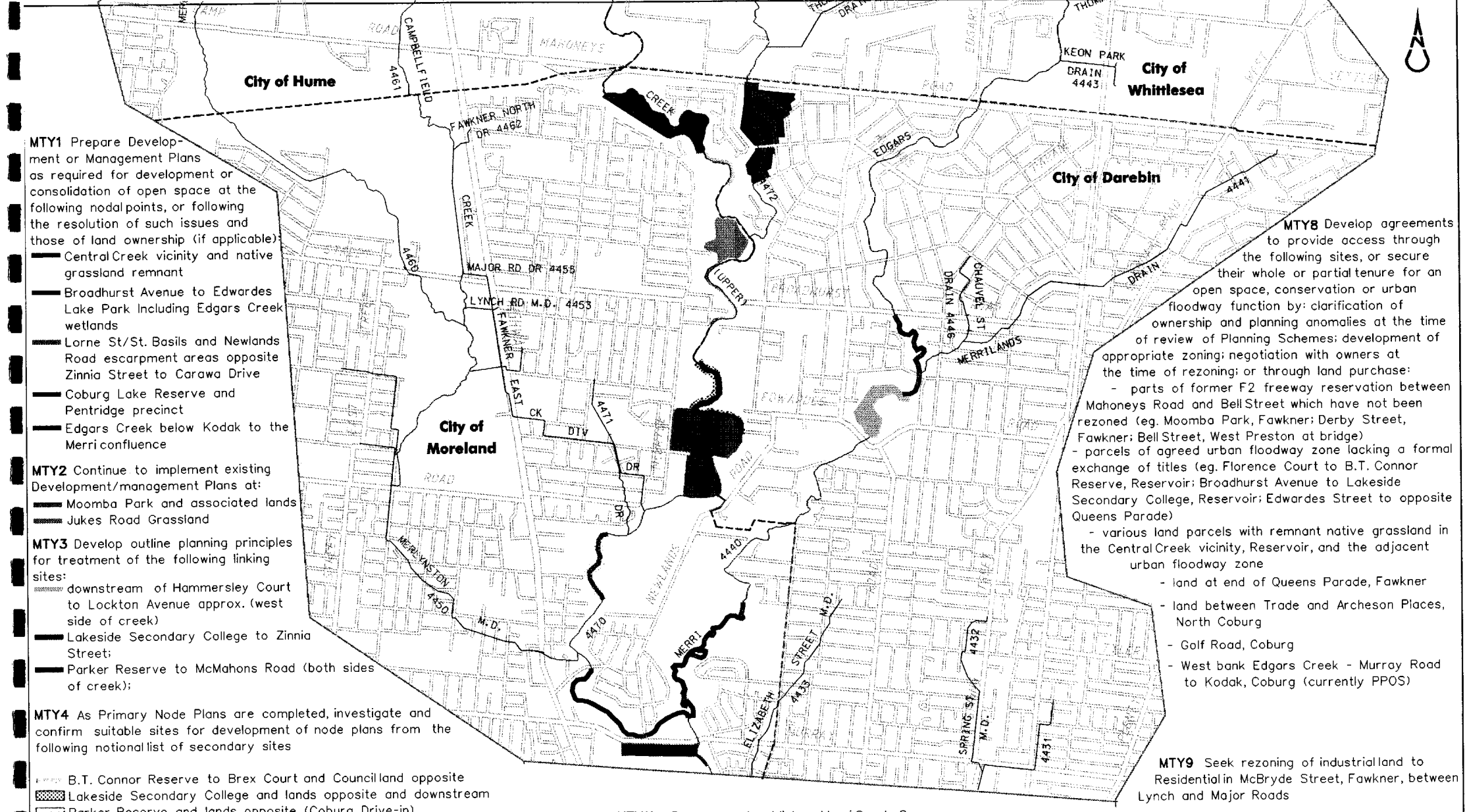
CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
MTY1	Prepare Development or Management Plans as required for development or consolidation of open space at the following nodal points where land use is not at issue, or following the resolution of such issues and those of land ownership (if applicable):					
	• Central Creek vicinity and native grassland remnant	Darebin	MCMC		$	High
	• Broadhurst Avenue to Edwardes Lake Park including Edgars Creek wetlands	Darebin	MW, MCMC		$$	High
	• Lorne St/St. Basils and Newlands Road escarpment areas opposite - Zinnia Street to Carawa Drive	Moreland, Darebin	MCMC	✓	$$	Medium
	• Coburg Lake Reserve and Pentridge precinct	Moreland	MCMC		$$	Medium
	• Edgars Creek below Kodak to the Merri confluence	Moreland	MCMC, MW		$$	Medium
	• Tate/Capp-Robinson/Egan/Strettle Reserves	Moreland Darebin,	MCMC, MW	✓	$$	Medium
	• Northcote Golf Course, Allard Park/ North-East Park/Roberts Reserve	Darebin, Moreland	MCMC, MW	✓	$$	Medium
	• CERES site	Moreland	MCMC		$$	High
	• Phillips Reserve, Kirkdale Street Park, Sumner Park and whole of Merri Park (including its Crown Land)	Moreland, Darebin	MW, MCMC	✓	$$	Medium
	• St. Georges Road to Rushall Station - all lands on both sides of the stream	Moreland, Darebin, Yarra	MCMC, MW	✓	$$	Medium
	• Hall Reserve/Quarries Reserve	Yarra	MCMC		$$	High

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
MTY2	Continue to implement existing Development/Management Plans as they apply to Council's management of open space at: • Moomba Park and associated lands; • Jukes Road Grassland	Moreland, Darebin, PV (for Jukes Road)	MCMC		$$	High
MTY3	Develop outline planning principles for treatment of the following linking sites:					
	• downstream of Hammersley Court to Lockton Avenue approx. (west side of creek);	Darebin	MCMC MW		$	Medium
	• Lakeside Secondary College to Zinnia Street;	Darebin	MCMC		$	Medium
	• Parker Reserve to McMahons Road (both sides of the creek);	Moreland	MCMC		$	Low
	• lands on both sides of the creek from De Chene Reserve/Bell Street to the Harding Street footbridge; and	Darebin, Moreland	MCMC	✓	$	Medium
	• Egan Reserve to Normanby Avenue (west side of creek).	Moreland	MCMC		$	Medium
MTY4	As Primary Node Plans are completed, investigate and confirm suitable sites for development of node plans from the following notional list of secondary sites. ***Note: Priority here refers to preliminary priority given to development of a node plan for the site***					
	• B. T. Connor Reserve to Brex Court and Council land opposite	Darebin, Moreland	MCMC	✓	$$	Low
	• Lakeside Secondary College and lands opposite and downstream	Darebin, Moreland	MCMC	✓	$$	Low
	• Parker Reserve and lands opposite (Coburg Drive-In)	Moreland	MCMC		$$	Low
	• lands on the Brunswick and North Fitzroy side of the creek downstream of Sumner Park to St. Georges Road, and the Northcote side of the creek downstream of Merri Park to St. Georges Road	Moreland, Darebin, Yarra	MCMC	✓	$$	Medium
	• lands on both side of the creek from Rushall Station to Heidelberg Road including all Crown land and the steep slopes and escarpment areas below Coulson Reserve and the Knott Athletic field in Clifton Hill.	Darebin, Yarra	MCMC	✓	$$	Medium

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
MTY5	Include examination of the Merri Creek frontage in the review of the Yarra Bend Park Management Plan	PV	MCMC		N/A	High
MTY6	Maintain developed areas of open space such that initial capital investment is not jeopardised	Moreland*, Darebin, Yarra	MCMC	✓	$$$	High
MTY7	Conduct a triennial review of land ownership and zoning along Merri Creek and major tributaries below Mahoneys Road to monitor opportunities to consolidate the open space corridor	Moreland, Darebin, Yarra	MCMC, MW, PV, VicRoads	✓	$	High
MTY8	Develop agreements to provide access through the following sites, or secure their whole or partial tenure for an open space, conservation or urban floodway function by: clarification of ownership and planning anomalies at the time of review of Planning Schemes; development of appropriate zoning; negotiation with owners at the time of rezoning; or through land purchase:					
	• parts of former F2 freeway reservation between Mahoneys Road and Bell Street which have not been rezoned (eg. Moomba Park Fawkner; Jukes Road, Fawkner; Derby Street, Fawkner; Bell Street, West Preston at bridge).	Moreland	MCMC PV		$$	High
	• parcels of agreed urban floodway zone lacking a formal exchange of titles (eg. Florence Court to B. T. Connor Reserve, Reservoir; Broadhurst Avenue to Lakeside Secondary College, Reservoir; Edwardes Street to opposite Queens Parade).	MW	Darebin Moreland MCMC		$	High
	• Various land parcels with remnant native grassland in the Central Creek vicinity, Reservoir, and the adjacent urban floodway zone	Darebin	MCMC PV, VicRoads		$$	High

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
MTY8 *(cont'd)*	• land at end of Queens Parade, Fawkner	Moreland	MCMC		$	Medium
	• land between Trade and Acheson Places, North Coburg	Moreland, MW	MCMC		$	Medium
	• Golf Road, Coburg	Moreland	MCMC		$	Medium
	• West bank Edgars Creek - Murray Road to Kodak, Coburg (currently PPOS)	Moreland	MCMC MW		$	Medium
	• Booth Street to Bell Street (east side)	Moreland	MCMC		$	Medium
	• Clara Street, East Brunswick adjacent to Abrahams Reserve, (currently Residential, intrudes into open space)	Moreland	MCMC		$	High
	• CERES creek frontage Brunswick (currently PPOS, General Industrial)	Moreland	MCMC MW		$	High
	• Beavers Road to Arthurton Road, including especially Goldsmith Grove, Northcote (potential rezoning at change of land use of printing factory - with aim of securing increased creek frontage)	Darebin	MCMC		$	Medium
	• Elizabeth Street Northcote rear shed which abuts corridor (potential rezoning at change of land use - aim to secure increased creek frontage)	Darebin	MCMC MW		$	Medium
	• North and south of Barkly Street, North Fitzroy.	Yarra	MCMC		$	High
	• Cunningham Street Northcote (Monumental Masons site - potential rezoning at change of land use - aim to secure increased creek frontage)	Darebin	MCMC MW		$$	Medium
MTY9	Seek rezoning of industrial land to Residential in McBryde Street, Fawkner between Lynch and Major Roads	Moreland	MCMC		$	Low
MTY10	Develop and implement a Fire Management Plan for the reach in consultation with MFB	Moreland*, Darebin, Yarra*	MCMC MFB PowerNet	✓	$	High

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
MTY11	Prepare and publish a Merri Creek Open Space Development Guidelines manual comprising: • recommended standard designs and landscape development treatments; • guidelines for revegetation and remnant vegetation management; • guidelines for location and design of facilities	Whittlesea*, Hume*, Moreland*, Darebin*[p], Yarra*	MCMC MW PowerNet	✓	$$	High
MTY12	Ensure planning and delivery staff are trained in natural area and cultural site management	Whittlesea, Hume*, Moreland*, Darebin*, Yarra*, MW	MCMC	✓	$$	High



MTY1 Prepare Development or Management Plans as required for development or consolidation of open space at the following nodal points, or following the resolution of such issues and those of land ownership (if applicable):

- Central Creek vicinity and native grassland remnant
- Broadhurst Avenue to Edwardes Lake Park including Edgars Creek wetlands
- Lorne St/St. Basils and Newlands Road escarpment areas opposite Zinnia Street to Carawa Drive
- Coburg Lake Reserve and Pentridge precinct
- Edgars Creek below Kodak to the Merri confluence

MTY2 Continue to implement existing Development/management Plans at:

- Moomba Park and associated lands
- Jukes Road Grassland

MTY3 Develop outline planning principles for treatment of the following linking sites:

- downstream of Hammersley Court to Lockton Avenue approx. (west side of creek)
- Lakeside Secondary College to Zinnia Street;
- Parker Reserve to McMahons Road (both sides of creek);

MTY4 As Primary Node Plans are completed, investigate and confirm suitable sites for development of node plans from the following notional list of secondary sites

- B.T. Connor Reserve to Brex Court and Council land opposite
- Lakeside Secondary College and lands opposite and downstream
- Parker Reserve and lands opposite (Coburg Drive-in)

MTY6 Maintain developed areas of open space such that initial capital investment is not jeopardised

MTY7 Conduct a triennial review of land ownership and zoning along Merri Creek and major tributaries below Mahoney's Road to monitor opportunities to consolidate the open space corridor

MTY8 Develop agreements to provide access through the following sites, or secure their whole or partial tenure for an open space, conservation or urban floodway function by: clarification of ownership and planning anomalies at the time of review of Planning Schemes; development of appropriate zoning; negotiation with owners at the time of rezoning; or through land purchase:

- parts of former F2 freeway reservation between Mahoneys Road and Bell Street which have not been rezoned (eg. Moomba Park, Fawkner; Derby Street, Fawkner; Bell Street, West Preston at bridge)
- parcels of agreed urban floodway zone lacking a formal exchange of titles (eg. Florence Court to B.T. Connor Reserve, Reservoir; Broadhurst Avenue to Lakeside Secondary College, Reservoir; Edwardes Street to opposite Queens Parade)
- various land parcels with remnant native grassland in the Central Creek vicinity, Reservoir, and the adjacent urban floodway zone
  - land at end of Queens Parade, Fawkner
  - land between Trade and Archeson Places, North Coburg
  - Golf Road, Coburg
  - West bank Edgars Creek - Murray Road to Kodak, Coburg (currently PPOS)

MTY9 Seek rezoning of industrial land to Residential in McBryde Street, Fawkner, between Lynch and Major Roads

MTY10 Develop and implement a Fire Management Plan for the reach in consultation with MFB

MTY11 Prepare and publish a Merri Creek Open Space Developement Guidelines manual comprising:

- recommended standard designs and landscape development treatments;
- guidelines for revegetation and remnant vegetation management;
- guidelines for location and design of facilities

MTY12 Ensure planning and delivery staff are trained in natural area and cultural site management.

0 1 2 km

Underground Drain
Open Channel
Natural Waterway
Catchment Boundary
Council Boundary

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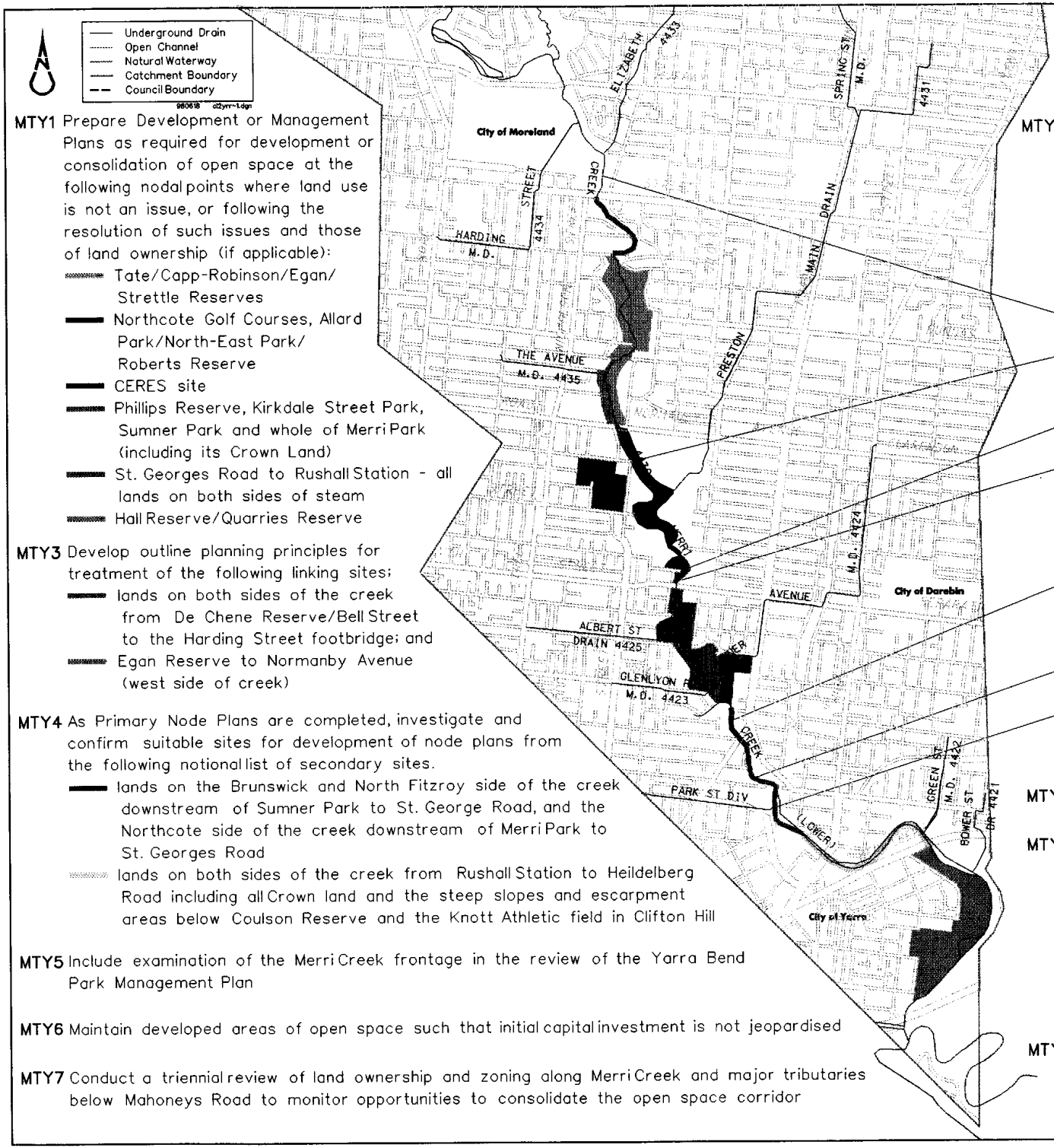
MAHONEYS ROAD TO COBURG LAKE
Flora, Fauna and Open Space Actions for Section 2.3

COBURG LAKE TO YARRA RIVER
Flora Fauna and Open Space Actions for Section 2.3



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- Tate/Capp-Robinson/Egan/ Strettle Reserves
- Northcote Golf Courses, Allard Park/North-East Park/ Roberts Reserve
- CERES site
- Phillips Reserve, Kirkdale Street Park, Sumner Park and whole of Merri Park (including its Crown Land)
- St. Georges Road to Rushall Station - all lands on both sides of steam
- Hall Reserve/Quarries Reserve

MTY3 Develop outline planning principles for treatment of the following linking sites;

- lands on both sides of the creek from De Chene Reserve/Bell Street to the Harding Street footbridge; and
- Egan Reserve to Normanby Avenue (west side of creek)

MTY4 As Primary Node Plans are completed, investigate and confirm suitable sites for development of node plans from the following notional list of secondary sites.

- lands on the Brunswick and North Fitzroy side of the creek downstream of Sumner Park to St. George Road, and the Northcote side of the creek downstream of Merri Park to St. Georges Road
- lands on both sides of the creek from Rushall Station to Heildelberg Road including all Crown land and the steep slopes and escarpment areas below Coulson Reserve and the Knott Athletic field in Clifton Hill

MTY5 Include examination of the Merri Creek frontage in the review of the Yarra Bend Park Management Plan

MTY6 Maintain developed areas of open space such that initial capital investment is not jeopardised

MTY7 Conduct a triennial review of land ownership and zoning along Merri Creek and major tributaries below Mahoneys Road to monitor opportunities to consolidate the open space corridor

MTY8 - Develop agreements to provide access through the following sites, or secure their whole or partial tenure for an open space, conservation or urban floodway function by: clarification of ownership and planning anomalies at the time of review of Planning Schemes; development of appropriate zoning; negotiation with owners at the time of rezoning; or through land purchase:

- Booth Street to Bell Street (east side)
- Clara Street, East Brunswick adjacent to Abrahams Reserve, (currently Residential, intrudes into open space)
- CERES creek frontage Brunswick (currently PPOS, General Industrial)
- Beavers Road to Arthurton Road, including especially Goldsmith Grove, Northcote (potential rezoning at change of land use or printing factory - with aim of securing increased creek frontage)
- Elizabeth Street, Northcote rear shed which abuts corridor (potential rezoning at change of land use - aim to secure increased creek frontage)
- North and south of Barkly Street, North Fitzroy
- Cunningham Street, Northcote (Monumental Masons site - potential rezoning at change of land use - aim to secure increase creek frontage)

MTY10 - Develop and implement a Fire Management Plan for the reach in consultation with MFB

MTY11 - Prepare and publish a Merri Creek Open Space Development Guidelines manual comprising:

- recommended standard designs and landscape development treatments;
- guidelines for revegetation and remnant vegetation management;
- guidelines for location and design of facilities

MTY12 - Ensure planning and delivery staff are trained in natural area and cultural site management

PART B - WATER

SECTION 3 - Waterway Management

3.1 Waterway, Drainage and Flood Management

Background

Roles and Responsibilities

Melbourne Water has a principal responsibility for water-related functions along Merri Creek. Councils play a key supporting role through the management of local drains which feed into the Melbourne Water regional system or Main Drains. Councils thus have an important local role in assisting with protection of water quality prior to its discharge to Main Drains and waterways.

Councils also have an ability to influence planning requirements to assist in flow quantity management and protection of water quality through administration of planning schemes. In this regard the role of Councils in urban fringe areas will be critical. As urban development spreads north from Craigieburn and Epping North, it is important that water sensitive urban design becomes an integral part of new developments. This means that provision should be made for retarding basins to contain peak flows, sediment and litter traps to reduce catchment pollution and wetlands to treat stormwater.

At a metropolitan level the development of a more effective and formal relationship between Melbourne Water, Councils (represented through the MAV), and the EPA to address stormwater issues has been formalised through the recently signed Stormwater Agreement.

As a waterway manager it is Melbourne Water's task to provide multiple-objective waterway outcomes. In the context of its current responsibilities, this means that Melbourne Water is required to deliver:

- waterway and riparian zone management, including protection and enhancement of flora, fauna and habitat values within the floodplain.

In addition, Melbourne Water also facilitates:

- water quality protection and improvement works; and
- waterway recreation setting provision so others can develop waterway recreation facilities.

These functions are performed alongside Melbourne Water's key flood and regional drainage management responsibilities as part of a comprehensive and balanced approach to waterway management.

Stream morphology

Stream morphology is the starting point in examining waterway management. The alignment and geomorphological form of Merri Creek has been derived from the spread of lava emitted by eruption points at Mount Fraser, Green Hill, Bald Hill and Hayes Hill in the area between Wallan and Craigieburn. The youngest of these lava flows was from either Mount Fraser or Hayes Hill some 800,000 years ago. With the lava surface sloping down towards the east and south from these eruption points, the creek's course came to be defined around the eastern edges of the lava with its eventual course determined by natural depressions and ridges in the lava surface and by the major fractures and joints in the volcanic rock (Rosengren, 1993).

Unfortunately the Merri Creek's natural geomorphology has been extensively disturbed since European settlement and the opportunities for its preservation and the protection of some of the natural interactive processes between the stream and its floodplain have been lost. Rosengren (1993, p. 8-9), has detailed the nature of human activities over the past 150 years which have significantly altered Merri Creek and identified those sites most affected. Rosengren concludes that a highly modified environment has been produced over long sectors of Merri Creek, "especially at Wallan East, south of Bald Hill, Donnybrook and Craigieburn East, and virtually continuously from Campbellfield to the Yarra River."

Extensive channel modification work by the MMBW over many decades up to the mid 1980s was principally responsible for the changes to most of the creek from Campbellfield to the Yarra River.

These works were designed to increase the capacity of the stream to carry flows from flood events. There were also works to straighten various sections of the creek to address local flooding problems. While these works often solved short-term concerns, they have also reduced opportunities to manage the stream as a natural resource due to loss of the creek's natural morphology. Loss of the stream's natural floodplain through filling and development is a further element of the problem.

Typically, streams across the basaltic soils of Melbourne's north and west display a "pool and run" form where they successively pond at regular points before entering a "run" sequence. Where modification of the creek channel has caused the loss of natural form, only comparatively minor improvement works in the form of retrofitting riffles can be undertaken to alleviate some of this loss and create a more natural stream form.

Besides protection of the stream's remaining morphology, a related key element of waterway management is protection of the given stream form and its stability. Stream banks which are subject to erosive forces can, if left untreated, contribute massive amounts of sediment to the water course and other receiving bodies. Excessive sediment levels are a major contributor to loss of stream life and its diversity.

However, Merri Creek fortunately does not suffer significant bank erosion problems. In some parts this may be due to the restriction on valley widening brought about by the toughness of the lava flows defining the stream. Rosengren (1993) describes Merri Creek as having, for the most part, well-defined flows within a narrow valley bounded by steep slopes and bluffs with rocky cliffs and gorge sectors. Edgars Creek at North Coburg was one of the few sites within the urban section of the Merri system where significant erosion of the stream bank was taking place in recent times. Works to address the problem were undertaken by Melbourne Water in 1996/7.

Willow and Other Exotic Tree Control

A further key, and sometimes controversial element of waterway management is willow control. Willows are a problem because of their capacity to spread rapidly, effect stream form and diminish stream eco-systems through shading and excessive leaf fall in autumn. Nonetheless, sections of the community value mature willows for aesthetic reasons and control works must be managed with these sensitivities in mind. Willow control works along Merri Creek have been conducted for many years by Melbourne Water, Councils and the MCMC. Melbourne Water has recently developed a control procedure for willows which sets out the scope of the issues and the methods for control (Melbourne Water, 1997).

Other exotic environmental weeds can also become a problem for waterway management. Desert Ash, for example, has become a major weed of the riparian zone along sections of Merri Creek within its urban reaches. There are a variety of seed sources of Desert Ash within the catchment, with many specimens having become established in private gardens. However, the original source of seed is likely to have been amenity plantings in parks and the use of Desert Ash as street trees in parts of the catchment. From sources such as these, Desert Ash seed is transported via the stormwater system to Merri Creek where it germinates in the nutrient rich fringes of the stream. Thus work in the catchment to limit Desert Ash seed generation will be required if the problem is to be managed.

Protection of Stream Values

Protection of the natural values of the stream is another key aspect of waterway management. Melbourne Water is involved in management of the remnant flora and fauna of the stream and its riparian zone as well as revegetation and habitat enhancement. Works of this nature provide for the creation of a waterway corridor able to cater for flora movement as well as providing important microclimates and stream settings capable of facilitating recreational use. Vegetation management works by Councils and MCMC on open space lands associated with the waterway also add significantly to the vegetation cover of the waterway and are important to the creation of a broader and more effective stream corridor and recreation setting.

However, revegetation works need to complement the essential drainage function of the waterway, especially its ability to handle major flood events. Excessive use of shrubby species in revegetation works immediately upstream and downstream of major road crossings, or critical culverts, can cause an increase in the roughness co-efficient of the water during major flood events and raise flood levels. In some instances along Merri Creek this may endanger the structural integrity of crossings and even threaten the ability of nearby levees to hold back flood waters.

Flood Protection

An effective outfall of the drainage system from the rural and urban catchment areas of Merri Creek is a key component of Melbourne Water's regional drainage responsibilities. This means that the waterway and associated floodplain should be capable of storing and transmitting the 1% probability flood event generated from the catchment, without impact on life and property.

The conduct of these responsibilities means that Melbourne Water implements appropriate drainage strategies and works to address the provision of that level of flood protection. It is also critical to the exercise of those responsibilities that Councils continue to support flood protection by ensuring that no development is permitted within floodplains. Further it is important to ensure that overland flow paths are protected to enable passage of flood waters during major events.

Following a major flood of Merri Creek in May 1974, the MMBW acquired several parcels of land for construction of retarding basins to manage such events. The purchase of lands at Campbellfield, in the Barry Road area, was completed after the 1974 flood. This site was approved in principle for a retarding basin in 1966 after the floods of 1963 (MMBW, 1981). Due to the completion of other flood management works (a major retarding basin on Kalkallo Creek below Gums Gully Road and levee works at Thornbury, Northcote and Brunswick), the Campbellfield basin has not yet been constructed. However, with the pace of urban consolidation in the lower parts of the catchment, works to construct the basin may need to be brought forward.

Other smaller basins within the Merri system are located on Merlynston Creek at: Dallas Drive, Broadmeadows; Jack Roper Reserve; and immediately upstream of Box Forest Road. Further retarding basins are located on Campbellfield Creek below the Western Ring Road and near Winifred Street in Northcote as part of a levee/flood mitigation treatment for the Sumner Estate area.

During the last decade many other flood mitigation works were carried out by the MMBW in the lower catchment. Examples are at Strettle Reserve/Anderson Road in Thornbury, Winifred Street in Northcote and Alister Street, East Brunswick. All these sites demonstrate that flood mitigation works can be performed in a manner which is environmentally sensitive and which meet multiple-objective waterway management requirements.

Drainage Schemes

The introduction of drainage schemes is a primary means by which Melbourne Water can manage these multiple-objective tasks. Drainage schemes are usually prepared for sub-catchments in urban fringe areas subject to greenfields development, and provide for drainage needs in a comprehensive fashion, while also taking account of waterway environmental management and landscape setting needs. Such drainage schemes are currently in preparation by Melbourne Water for Aitken and Malcolm Creeks in the Craigieburn area. Drainage schemes first require the development of a drainage strategy with mapping and designation of flood prone areas to ensure they are protected from filling and other potentially inappropriate impacts of development.

Once in place drainage schemes permit Melbourne Water to set aside land for drainage purposes. This allows the construction of retarding basins and other mechanisms to control drainage and flood waters. Water quality improvement ponds are also be factored into the development of a drainage scheme so that rural runoff quality is maintained.

Issues

- Merri Creek has lost much of its natural morphology and retrofitting of rock riffles provides one means by which the stream form can be returned to a more natural state.

- While stream erosive forces have not effected the stability of most of the Merri system, instances of bank erosion need to be addressed in a manner which will return the waterway to a sustainable form and prevent harmful sediment contribution to the stream.

- Formal procedures need to be followed to ensure that willow and other exotic vegetation control continues to be conducted with adequate community consultation and the use of recommended techniques.

- Inappropriately located shrubby vegetation immediately upstream and downstream of critical culverts (road crossings), has the potential, in major flood events, to raise flood levels and threaten tne functioning of the culverts and nearby levees.

- Urban consolidation in tne lower catchment increases the amount of runoff requiring management at that point or alternatively through an offset from other activities higher in the catchment (eg. construction of the Campbellfield Retarding Basin).

- Greenfield sites on the urban fringe provide opportunities for provision of water-sensitive drainage design with the inclusion of state of the art water quality treatment measures. Preparation of Melbourne Water drainage schemes can facilitate this, but Councils need to be alert to these opportunities in their administration of planning processes.

Objectives

- Comprehensive management of the stream for waterway, drainage and flood protection ends and attainment of long term sustainability of the stream.

- Achievement of Melbourne Water's waterway management objectives as set out in its Draft Waterway and Water Quality Strategies (in prep.).

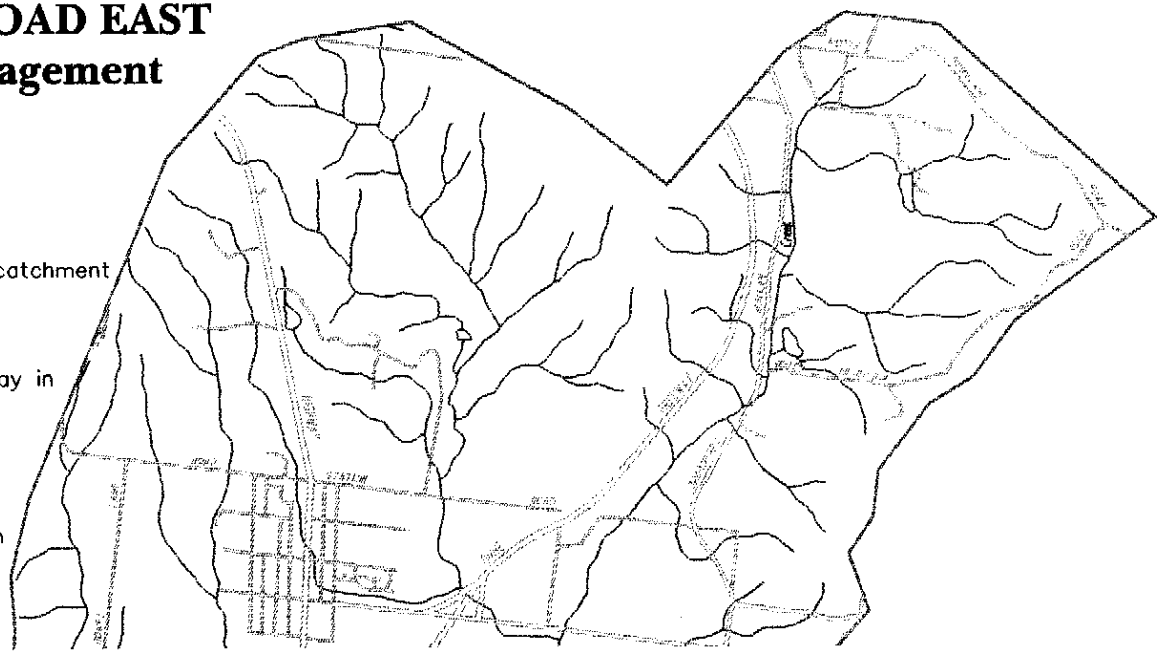
- Attainment of a waterway which, within a context of providing a physically functioning and sustainable stream, is also, especially in its urban context, aesthetically pleasing and capable of supporting a range of other uses (eg. recreation).

Action Program **Note:** * in accountable SA (Statutory Authority) or LGA (Local Government Authority) column = MCMC assigned responsibility for delivery of the action by that Council and **P** = partnership arrangement for delivery, usually between LGA and MCMC. Overall Notional Cost = combined notional cost of action for accountable parties. N/A = column heading is not applicable. Priority = the agreed priority attached to the action by the steering committee for the Strategy, which may differ from individual agency's timeframes for commencement of implementation of the action due to an agency's budgetary processes.

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
DR1	Maintain a flood and drainage management strategy for the catchment	MW, Whittlesea, Hume, Moreland, Darebin, Yarra			$$	High
DR2	Control further development of land within the 1% flood zone through means such as the Land Subject to Inundation Overlay in Council Planning Schemes	Whittlesea, Hume[P], Moreland, Darebin, Yarra, MW	MCMC		$	High
DR3	Use planning controls, developer guidelines and Municipal Stormwater Management Plans to manage and reduce runoff from existing and new areas through increased use of permeable surfaces and other measures for on-site retention of stormwater	Whittlesea, Hume[P], Moreland, Darebin, Yarra[P], MW	MCMC		$	High
DR4	Undertake works to maintain adequate stream stability within a context of protecting other stream values	MW	Whittlesea, Hume[P], Moreland, Darebin, Yarra[P], MCMC		$$$	High
DR5	Trial habitat and morphology restoration treatments (especially rock riffles) to restore the pool and run form of the stream	MW	MCMC		$$	Medium
DR6	Facilitate use of appropriate indigenous riparian vegetation at key road crossings and critical culverts	MW	Whittlesea, Hume, Moreland, Darebin, Yarra, MCMC		$$	Medium
DR7	Develop a long-term willow and other major environmental weed management program for riparian areas	MW	Whittlesea, Hume, Moreland, Darebin, Yarra, MCMC		$$	High

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
DR8	Assess the incidence of Desert Ash in the catchment, its impacts on the riparian fringe of the stream and investigate appropriate action to reduce the seed source, including replacement of Desert Ash trees in streetscapes and as amenity plantings	Hume[P], Moreland*, Darebin[P], Yarra[P],	MW, MCMC	✓	$$	High
DR9	Manage flood protection within overland flow paths to Merri Creek	MW	Whittlesea, Hume, Moreland, Darebin, Yarra, MCMC		$$$	Medium

HEADWATERS TO CRAIGIEBURN ROAD EAST
Waterways, Drainage and Flood Management Actions for Section 3.1



DR1 Maintain a flood and drainage management strategy for the catchment

DR2 Control further development of land within the 1% flood zone through means such as the Land Subject to Inundation Overlay in Council Planning Schemes

DR3 Use planning controls, developer guidelines and Municipal Stormwater Management Plans to manage and reduce runoff from existing and new areas through increased use of permeable surfaces and other measures for on-site retention of stormwater

DR4 Undertake works to maintain adequate stream stability

HEADWATERS TO CRAIGIEBURN ROAD EAST
Waterways, Drainage and Flood Management Actions for Section 3.1

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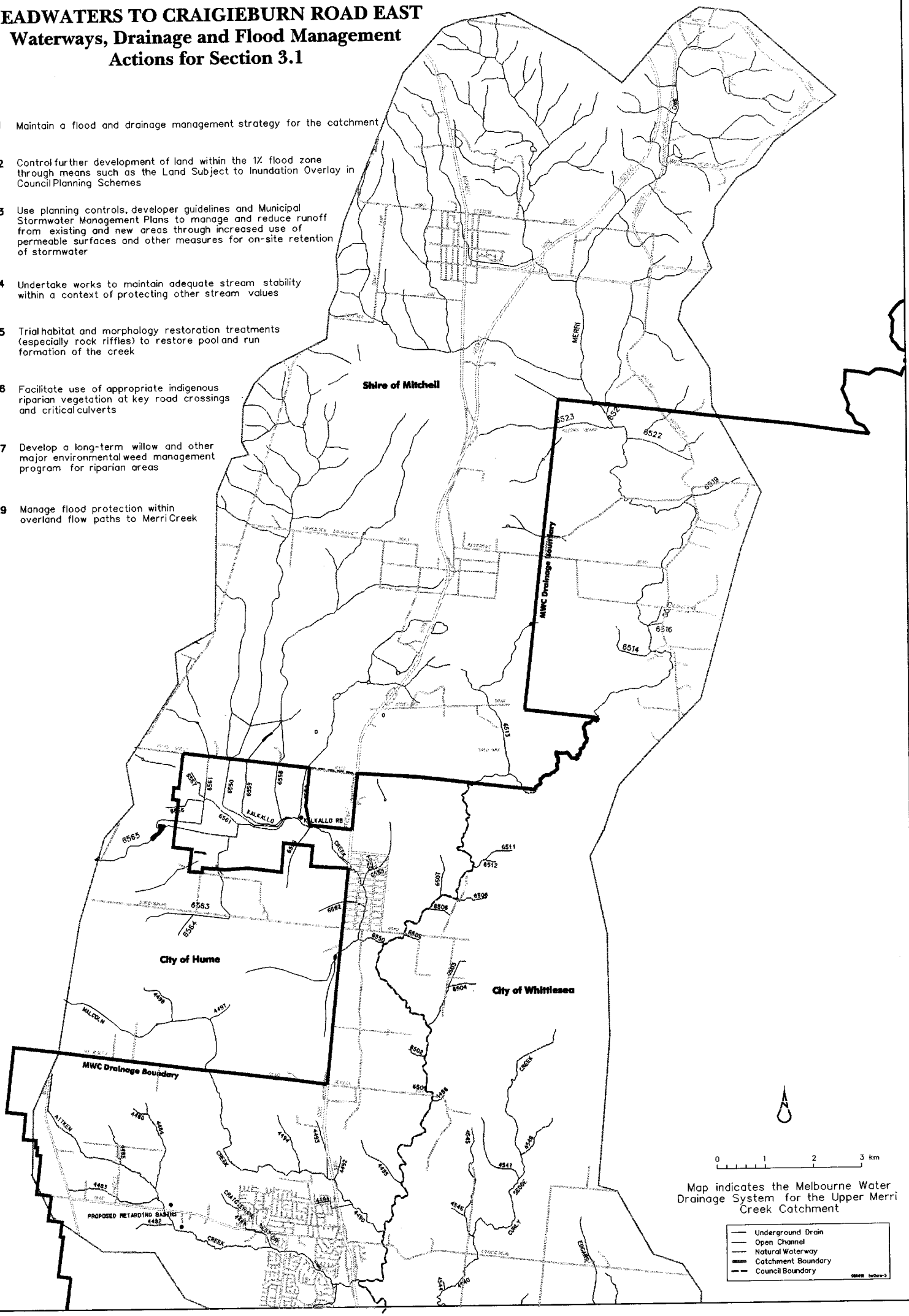
DR4 Undertake works to maintain adequate stream stability within a context of protecting other stream values

DR5 Trial habitat and morphology restoration treatments (especially rock riffles) to restore pool and run formation of the creek

DR6 Facilitate use of appropriate indigenous riparian vegetation at key road crossings and critical culverts

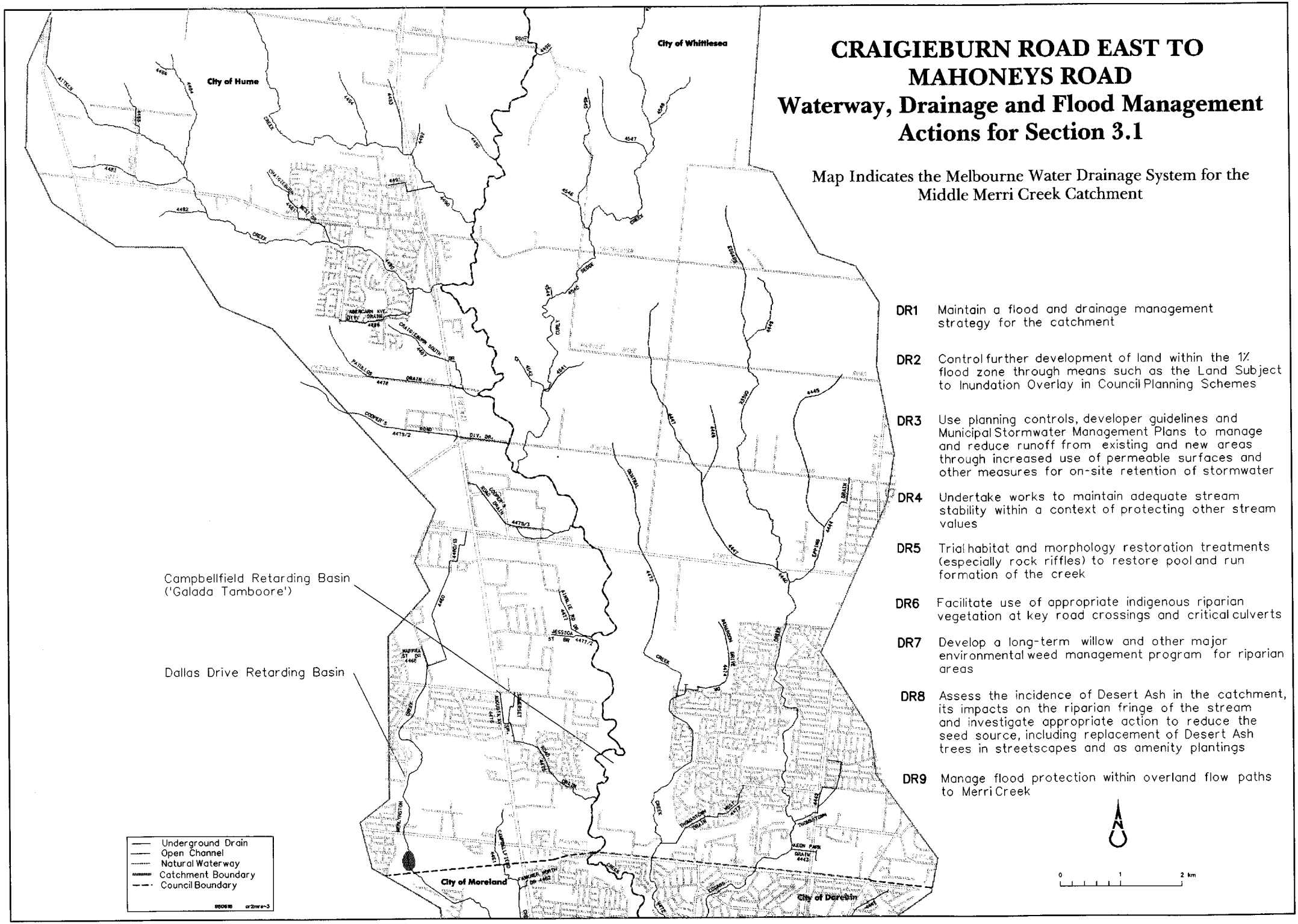
DR7 Develop a long-term willow and other major environmental weed management program for riparian areas

DR9 Manage flood protection within overland flow paths to Merri Creek



CRAIGIEBURN ROAD EAST TO MAHONEYS ROAD
Waterway, Drainage and Flood Management Actions for Section 3.1

Map Indicates the Melbourne Water Drainage System for the Middle Merri Creek Catchment



DR1 Maintain a flood and drainage management strategy for the catchment

DR2 Control further development of land within the 1% flood zone through means such as the Land Subject to Inundation Overlay in Council Planning Schemes

DR3 Use planning controls, developer guidelines and Municipal Stormwater Management Plans to manage and reduce runoff from existing and new areas through increased use of permeable surfaces and other measures for on-site retention of stormwater

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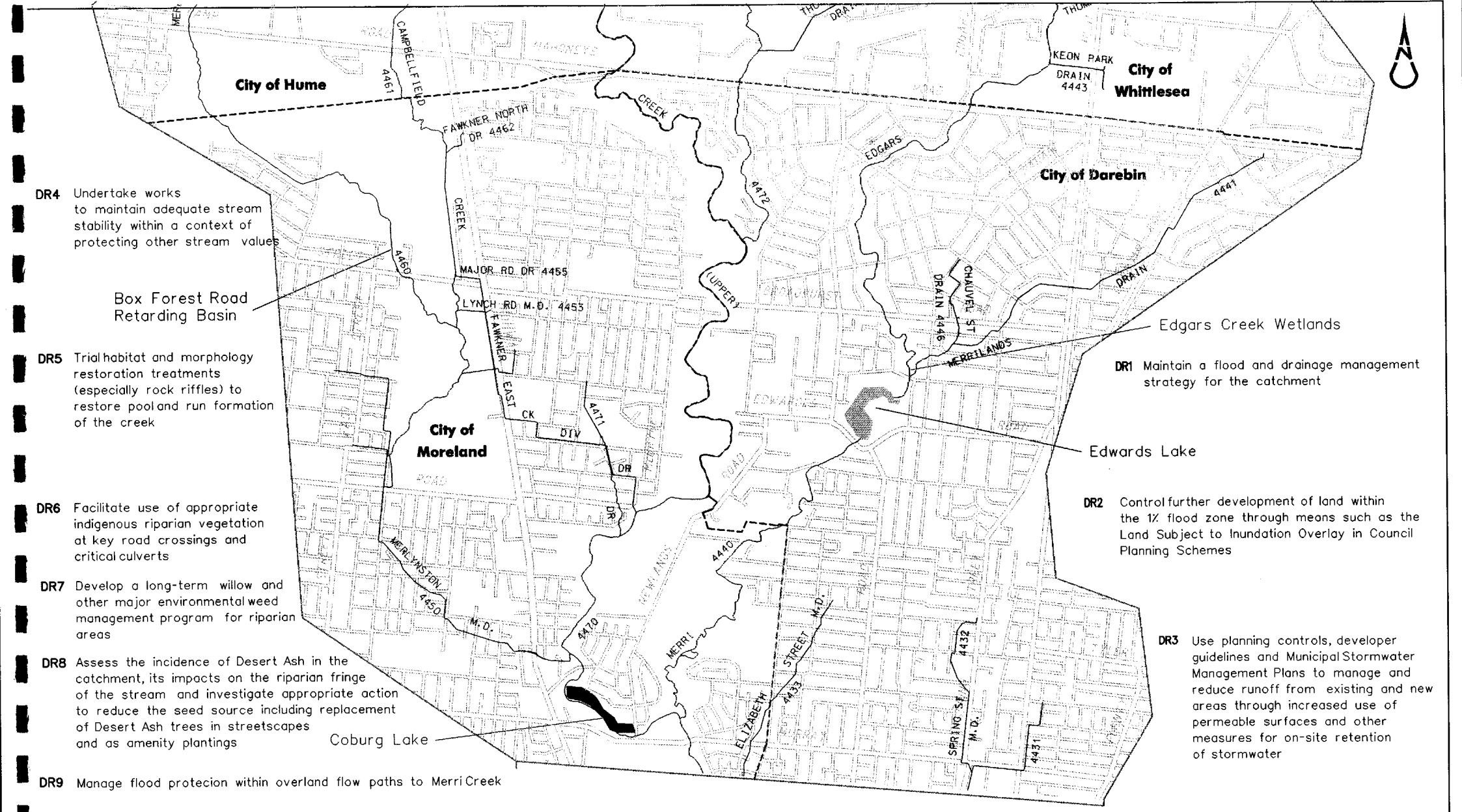
DR6 Facilitate use of appropriate indigenous riparian vegetation at key road crossings and critical culverts

DR7 Develop a long-term willow and other major environmental weed management program for riparian areas

DR8 Assess the incidence of Desert Ash in the catchment, its impacts on the riparian fringe of the stream and investigate appropriate action to reduce the seed source, including replacement of Desert Ash trees in streetscapes and as amenity plantings

DR9 Manage flood protection within overland flow paths to Merri Creek



DR4 Undertake works to maintain adequate stream stability within a context of protecting other stream values

DR5 Trial habitat and morphology restoration treatments (especially rock riffles) to restore pool and run formation of the creek

DR6 Facilitate use of appropriate indigenous riparian vegetation at key road crossings and critical culverts

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DR9 Manage flood protecion within overland flow paths to Merri Creek

DR1 Maintain a flood and drainage management strategy for the catchment

DR2 Control further development of land within the 1% flood zone through means such as the Land Subject to Inundation Overlay in Council Planning Schemes

DR3 Use planning controls, developer guidelines and Municipal Stormwater Management Plans to manage and reduce runoff from existing and new areas through increased use of permeable surfaces and other measures for on-site retention of stormwater

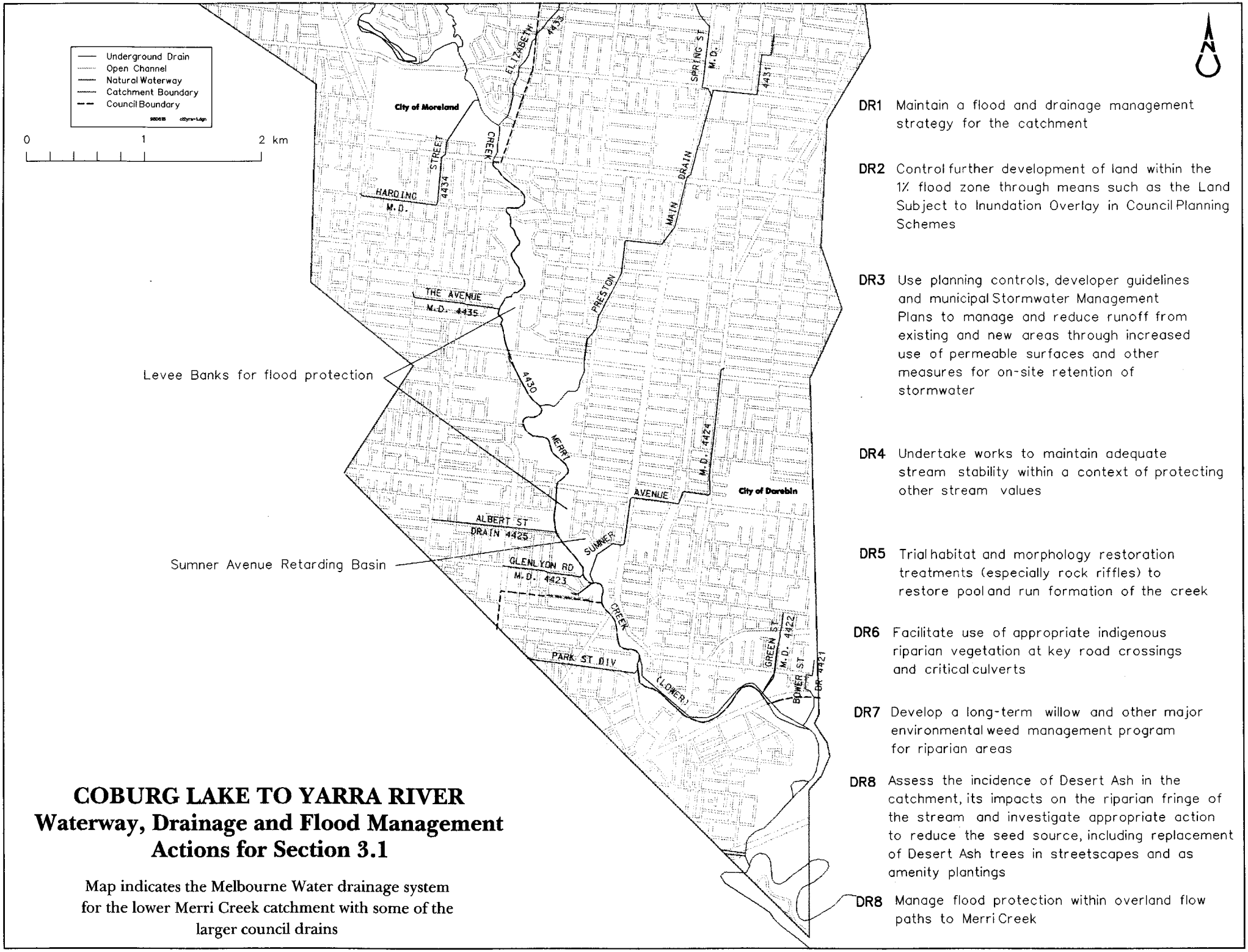
MAHONEYS ROAD TO COBURG LAKE
Waterway, Drainage & Flood Management Actions from Section 3.1

Map Indicates the Melbourne Water Drainage System for the Lower Merri Creek Catchment

Underground Drain
Open Channel
Natural Waterway
Catchment Boundary
Council Boundary

980618 mr2ole-2

0 1 2 km



COBURG LAKE TO YARRA RIVER
Waterway, Drainage and Flood Management Actions for Section 3.1

Map indicates the Melbourne Water drainage system for the lower Merri Creek catchment with some of the larger council drains

DR1 Maintain a flood and drainage management strategy for the catchment

DR2 Control further development of land within the 1% flood zone through means such as the Land Subject to Inundation Overlay in Council Planning Schemes

DR3 Use planning controls, developer guidelines and municipal Stormwater Management Plans to manage and reduce runoff from existing and new areas through increased use of permeable surfaces and other measures for on-site retention of stormwater

DR4 Undertake works to maintain adequate stream stability within a context of protecting other stream values

DR5 Trial habitat and morphology restoration treatments (especially rock riffles) to restore pool and run formation of the creek

DR6 Facilitate use of appropriate indigenous riparian vegetation at key road crossings and critical culverts

DR7 Develop a long-term willow and other major environmental weed management program for riparian areas

DR8 Assess the incidence of Desert Ash in the catchment, its impacts on the riparian fringe of the stream and investigate appropriate action to reduce the seed source, including replacement of Desert Ash trees in streetscapes and as amenity plantings

DR8 Manage flood protection within overland flow paths to Merri Creek

3.2 Water Quality

Background

Legislation and Policy

The environmental values, including water quality, of tributaries of the Yarra River such as Merri Creek, are currently protected by provisions of two State Environment Protection Policies (or SEPPs), namely Waters of Victoria and Waters of the Yarra River and Tributaries, 1984. A revised SEPP for the waters of the Yarra Catchment has been prepared over recent years and its publication is imminent. As part of its preparation, a Draft Policy Impact Assessment was prepared (Environment Protection Authority, [EPA], 1995). The release of the SEPP will have provisions binding on all individuals and organisations, government departments and agencies.

The Draft Schedule F7 Waters of the Yarra Catchment outlines broad beneficial uses to be protected by the SEPP. In the case of Merri Creek, the beneficial uses to be protected differ between the upper catchment (classified as a Rural Western Waterway) and the downstream catchment area (classified as an Urban Waterway). The beneficial uses to be protected for the Urban Waterway segment are: maintenance of aquatic ecosystems within highly modified ecosystems which have some habitat values; passage of indigenous fish; preservation and maintenance of indigenous riparian vegetation; recreation (conditional primary contact after 2003, secondary contact and passive recreation); production of edible fish and crustacea; agricultural use (and parks and gardens); and other commercial purposes such as industrial water use (EPA, 1995). SEPPs establish water quality objectives for specified beneficial uses of Victoria's streams. The environmental indicators attached to the beneficial uses are parameters such as dissolved oxygen, *E. coli*, pH, temperature and toxicants.

In addition, Melbourne Water has adopted a "No Spills" policy in relation to its management of the sewerage system. This means that with many trunk sewer lines running along urban streams, there should be no contamination of waterways from the sewerage system.

Water Quality Studies of Merri Creek

There have been a number of studies of the water quality of Merri Creek over the last twenty years or more. These studies have been overviewed by Finlay, McGann and Roy (1996). One of the more important studies (Mitchell and Dunn, 1993), reviewed recent and historic data, conducted a survey of water quality and reviewed the community water quality monitoring program.

The following conclusions about the quality of water in the Merri system has been drawn from recent information (Mitchell and Clark, 1991), and sampling for the Mitchell and Dunn study during 1992. The studies show:

- high levels of heavy metals in both Merri and Edgars Creeks;
- concentrations of nutrients remain high throughout Merri Creek with the Craigieburn Treatment Plant likely to be a major source;
- organic pollution has reduced over the past twenty years, but there appears to still be parts of Merri and Edgars Creeks which receive some organic pollution;
- salinity levels in parts of the Merri Creek often exceed the EPA's objectives. It is not known if this is a natural feature of the catchment or a result of rising water tables;
- turbidity and possibly suspended solids, periodically exceed EPA objective levels.

It can also be concluded that urban runoff and non-point source pollution are now dominant contributors to stormwater pollution of Merri Creek.

Relationship to Land Use

Changes in water quality along Merri Creek tend to be related to changes in land use. Rural sections of the creek are generally healthier than the industrial and urban sections, although they suffer different impacts and problems. In rural areas there are occasional high nutrient levels, while industrial areas demonstrate increases in heavy metal pollution. Problems in urban areas are the result of organic pollution and ageing sewerage systems, as well as diffuse source contributions from stormwater (Finlay, McGann and Roy, 1996).

Cooperative Arrangements

To protect and improve water quality, a cooperative arrangement has been developed between the EPA and Melbourne Water. The role of the EPA is to license discharges to waterways, supervise management of pollution spills and generally play a role in point source discharge monitoring and licensing. The objectives attached to the beneficial uses of the SEPP Schedule are the means by which the EPA sets some parameters for water quality measurement.

Melbourne Water's role is in the area of management of diffuse runoff. In addition it undertakes monitoring of stream water quality through its own Environmental Monitoring Network which is part of the EPA-endorsed Stream Watch Program. Melbourne Water also administers the Melbourne Waterwatch (formerly community Stream Watch) Program within the Port Phillip and Western Port catchment.

The Stormwater Management Agreement is another important extension of an emerging cooperation between agencies to address problems associated with urban stormwater. It has been developed between the EPA, Melbourne Water and local government (represented by MAV) and the Agreement between the parties has recently been signed (October 1997). It formalises a commitment to coordinate actions to address stormwater management and improvement. The actions which participants are committed to under the Agreement include:

- working with common principles of stormwater management;
- establishing performance objectives to guide planning and design of stormwater systems;
- identification of best practice environmental management practices to form a toolkit for stormwater management;
- the strategic application of these tools, in the context of agreed principles and performance objectives, through stormwater management planning;
- review and refinement of financial and administrative arrangements to deliver the required outcomes in the most cost effective manner; and
- resolving disputes or other problems before they become impediments to improved environmental outcomes.

A key product of the Agreement will the progressive development of local government stormwater management plans. These will include Drainage Framework Plans detailing the extent of stormwater drains for which Councils are responsible and which feed into Melbourne Water's regional drainage system. Melbourne Water is currently funding a pilot study of five municipalities (Brimbank, Hobsons Bay, Port Phillip, Kingston and Monash) to develop a first round of Municipal Stormwater Management Plans.

At the more local level, development of site specific cooperative arrangements also benefits improved outcomes for stream water quality. One example is the wetlands above Edwardes Lake. These were developed through the cooperative efforts of Darebin Council, Melbourne Water and the MCMC.

A Multi-Stemmed Approach

Protection and improvement of the quality of water in streams such as Merri Creek will involve a multi-stemmed approach to address specific problems in sub-catchment areas.

Rural Areas

The Wallan Sewage Treatment Plant, commissioned in the late 1980s and now operated by Goulburn Valley Water, is licensed by the EPA to discharge to land. There have been concerns that its operation may generate runoff or cause contamination of groundwater which could be transported to Merri Creek. Beardsell has reported that water quality in the Bald Hill area declined since its commissioning (Beardsell, 1997, Vol. 2, p. 15), although there are no supporting studies to confirm these observations. The Plant is expected to increase in size with sewering of Heathcote Junction and Wandong in the future.

In other parts of the rural catchment, farming communities require encouragement to fence streams from grazing and thus reduce bank disturbance and organic pollution contributions. There is evidence that some sections of the stream are suffering water quality problems brought on by these causes. Beardsell records that the area around Hernes Swamp is one such example with algal blooms generated by enrichment from stock faeces causing eutrophication of the stream water during the summer (Beardsell, 1997, Vol. 2, p. 17).

Melbourne Water has a Stream Frontage Management Program directed to assisting farmers through grants to carry out fencing, weed control and revegetation of stream banks. The Program has recently commenced in the Arthurs Creek area, but is yet to start operating in the upper catchments of Merri Creek.

Urban Fringe Areas

On the urban fringe residential development is planned north of Craigieburn to Mt. Ridley. This growth area was previously referred to as the Merri Growth Corridor. As defined at the moment, it extends from the transmission lines on the Kalkallo side of Mt. Ridley to Mt. Ridley Road in the south and Mickleham Road in the west (Hume City Council Planning Scheme - Exhibition Copy, 1997, 22.24). When completed it will see the linking of Roxburgh Park with Craigieburn and then north to an inter-urban break defined by transmission lines (ibid).

This area of planned urban expansion is wholly within the boundaries of Hume City Council and is expected to be a focus of population growth and development pressures in Hume over the next 15 years (ibid, 22.23). Current development approvals and plans envisage an ultimate population within this part of Hume of 90-100,000 people in the long term. This extent of urban development has the potential to cause significant impacts on Malcolm, Aitken and ultimately Merri Creeks.

The other area of planned urban expansion in the Merri Creek catchment is associated with the growth of the Epping North area into the upper catchment of Edgars Creek.

It is these greenfields sites which present the most significant opportunity to address the issue of improving the water quality of the Merri system. However, land needs to be set aside for wetland systems generally based upon a series of ponds to settle sediment and then treat water through a macrophyte dominated wetland. To enable this, the development of drainage schemes by Melbourne Water (see 3.1 above) is required, as well as the assistance of local government to support more water sensitive urban design in their administration of planning processes. It is important that drainage and water quality treatment issues are addressed at the Outline Development Plan (ODP) stage so that they become part of the basis upon which urban development is initially planned.

Industrial Areas

Further downstream, discharges derived from the catchments of industrial areas known to contribute heavy metals are a continuing problem for the state of Merri Creek's water quality. While the EPA licenses a number of industrial and other users to discharge to the stream (see Finlay, McGann and Roy, 1996, p. 39), it has been argued that the adequacy of the licence conditions should be re-assessed if the beneficial uses of the stream are to be protected (ibid, p. 39).

It is also known that there are contributions to the stream from organic pollutants derived from sewerage in both the urban fringe and upper urban areas of the catchment. The Craigieburn Treatment Plant is a significant contributor of nutrients to the stream.

Urban Areas

Within the established urban area there are many diffuse sources of pollutants of stormwater and streams. Bacterial contributions from animal faeces, nutrient-containing detergents from street car-washing, road paving material, oils and other vehicle sourced materials (eg. brake linings), vegetative material, and litter of various types all contribute to limiting the quality of water in urban streams.

Limited Opportunities for Improvements

In addition, there are limited opportunities to make dramatic improvements to the water quality of the stream in urban environments. Opportunities for installation of off-stream wetlands to treat stormwater before discharge to stream have been lost with intense land use for other purposes. Within the floodplain area of Merri Creek the steep-sided nature of much of the valley often precludes any on-stream or nearby floodplain treatments. There are also severe limitations placed on stormwater treatment through the high velocities of discharges to the main stream. Stormwater needs to be "quietened" through drop structures and other velocity-reducing devices before it can be treated in a series of ponds.

One option for some water quality improvement lies in the creation of ephemeral wetlands in the floor of some retarding basins in the urban catchment. Not all the retarding basins are suitable for development of wetlands, as a flat floor and sufficient catchment size (ie. flow contribution) are required to have the wetland operate effectively. It should also be noted that a minimum 1-1.5% of catchment area needs to be set aside for development of effective

Action Program **Note:** * in accountable SA (Statutory Authority) or LGA (Local Government Authority) column = MCMC assigned responsibility for delivery of the action by that Council and P = partnership arrangement for delivery, usually between LGA and MCMC. Overall Notional Cost = combined notional cost of action for accountable parties. N/A = column heading is not applicable. Priority = the agreed priority attached to the action by the steering committee for the Strategy, which may differ from individual agency's timeframes for commencement of implementation of the action due to an agency's budgetary processes.

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
WQ1	Extend Melbourne Water's Stream Frontage Management Program to rural areas of the Merri catchment	MW	Whittlesea, Hume, MCMC		$$$	Medium
WQ2	Plan the development of greenfields sites to include provision of water sensitive design features: permeable surfaces; wetlands in preference to lakes; sediment and gross pollutant traps; and wetlands for stormwater treatment.	MW, Whittlesea, Hume[P]	EPA, DI, MCMC		$	High
WQ3	Implement recommended measures contained in Chapter 5 - Water Sensitive Urban Design – from the Best Practice Environmental Management Guidelines for Urban Stormwater (Stormwater Committee, in prep.)	Whittlesea, Hume[P], Moreland, Darebin, Yarra, MW	EPA, DI, MCMC		$$$	High
WQ4	Carry out investigation and enforcement program for drains named in water quality study and contaminated sites (Mitchell and Dunn, 1993)	EPA	MCMC		$$	High
WQ5	Develop ephemeral wetlands in the retarding basin floor at Campbellfield as part of its future construction and investigate similar possible opportunities at the Dallas Drive retarding basin on Merlynston Creek and possible landscape enhancement at the Box Forest Road retarding basin	MW	MCMC		$$$	Medium
WQ6	Investigate the feasibility of restoration of Hernes and Camoola Swamps and their management as wetlands serving a water quality improvement function	MW	DNRE, MCMC		$	Medium
WQ7	Progressively develop stormwater management plans for municipalities within the Merri Creek catchment	MW, EPA, Whittlesea, Hume, Moreland, Darebin, Yarra[P]	MCMC		$$$	Medium

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
WQ8	Develop and adopt a Litter Policy for the catchment including a community education program, based upon research into primary sources and priority treatment of identified problem areas	Whittlesea, Hume[P], Darebin, Moreland*, Yarra*, MW	MCMC, EcoRecycle Victoria, EPA	✓	$	High

WQ9	As part of the implementation of the above Policy:
	• Develop a strategic plan (based on possible collection of further data) for installation and maintenance of litter traps at or near source on key drains in the catchment with particular attention given initially to the catchments of:
	  • Preston Main Drain;
	  • Merlynston Creek;
	  • Sumner Avenue Main Drain.
		Whittlesea, Hume, Moreland*, Darebin, Yarra, MW	MCMC		$$$	Medium

	• Approach major fast-food vendor stores in the urban catchment (eg. McDonalds: Epping, Campbellfield, Fawkner, Fawkner, Coburg, West Preston and Clifton Hill; KFC: Fawkner, Reservoir and Thornbury) regarding involvement in litter reduction strategies as outlined in "The Litter on Our Streets" (Murfitt & Le Couteur, 1997)	Whittlesea, Hume, Moreland, Darebin, Yarra*	MW, MCMC	✓	$	Medium
	• Investigate effects of Coburg and Edwardes Lakes on pollution/litter control and install pollution/litter control devices and sediment traps at Coburg Lake	Moreland, Darebin, MW	MCMC		$$	Medium
WQ10	Implement the Merri catchment Litter Policy in coordination with "Victoria's Litter Reduction Strategy" (EPA, 1995)	Whittlesea, Hume, Darebin, Moreland, Yarra, MW	EPA, MCMC		$$	High
WQ11	Investigate the installation of pollution/litter control devices, sediment traps and wetlands at outfalls along the creek corridor including: • the area above the former Night Soil Depot, Campbellfield; and • lower Central Creek.	MW, Hume[P] MW, Darebin	MCMC MCMC		$$ $$	Medium Medium

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
WQ12	Implement a community water quality monitoring and education program under the framework of Community Waterwatch	MW	MCMC, CERES		$$	High
WQ13	Continue to monitor water quality at VWQMN sites and investigate inclusion of additional sites at Campbellfield and Edgars Creek with emphasis on key issues such as heavy metals, sediment and nutrients.	MW	MCMC		$$	High
WQ14	Investigate the feasibility of removal of heavy metals from sediments of Merri Creek	MW	EPA, MCMC		$$	Low
WQ15	Develop drainage schemes and set aside land necessary for retarding basins and water quality protection measures.	MW	Whittlesea Hume MCMC		$$	High
WQ16	Include planning permit conditions, or develop other requirements for new or re-developments, to enable construction of pollution control devices and sediment and litter controls.	Whittlesea, Hume[P], Darebin, Moreland, Yarra[P], MW	MCMC		$	High
WQ17	Conduct a regular review of discharge licences within the context of an EPA "pollution hot spots" program and monitor old tip sites along the stream for discharges	EPA	MCMC		$$	High
WQ18	Develop and implement improved performance parameters for sewerage treatment plants in the Merri catchment and implement improved sewerage technology at Craigieburn STP for: • phosphorus removal; and • increased re-use	YVW, EPA	MW, MCMC		$	High
WQ19	Assess any impacts on the water quality of Merri Creek caused by runoff or groundwater infiltration from future expansion of the Wallan Sewerage Treatment Plant	MW, EPA	MCMC		$$	Medium
WQ20	Ensure compliance with Septic Tank Code of Practice and retention of all waste waters on-site for developments in unsewered areas.	Whittlesea, Hume[P], MW	MCMC		$	High

3.3 Waterway Ecosystem

Background

Healthy waterways require a suite of physical and chemical conditions in order to sustain themselves.

Physical Parameters

The physical parameters include:

- a stable substrate;
- stable banks;
- variable habitat niches (pools and ponds);
- variable micro-climate provided by vegetation and shading;
- provision of energy/food;
- a hierarchy of animal and trophic or food chain levels;
- low levels of pollution;
- sufficiently high levels of dissolved oxygen to support the respiration of a diversity of aquatic organisms;
- reduced levels of turbidity such that light is able to penetrate the waters to permit photosynthesis and sustain food sources for instream fauna;
- temperatures not excessively above or below seasonal norms so that breeding patterns of instream fauna are not disturbed and any flow-on effects (eg. on dissolved oxygen) are not produced; and
- salinity levels of a sufficiently low magnitude that the diversity of flora and fauna in the stream and its riparian zone is not depleted.

Chemical Parameters

The chemical parameters include:

- a level of suspended solids low enough so as not to smother organisms inhabiting the stream bed and other plants and fish and their habitat;
- Phosphorus and nitrogen levels within a range such that the waterway does not contain excessive nutrient levels encouraging outbreaks of filamentous and toxic algal growth and thereby threatening an alteration of the macroinvertebrate community structure and threats to animal and human life;
- moderate pH levels such that instream flora can grow and the toxicity of other pollutants is not altered or released into the water column;
- *E. coli* levels such that contact with the stream's water is not harmful to humans;
- BOD (or the amount of oxygen required by the biological processes taking place in the water), low enough to not unduly affect levels of dissolved oxygen; and
- heavy metals (eg. copper, cadmium, chromium, arsenic, lead, zinc, mercury) which must not be permitted to accumulate in sediment to the point where they are harmful to aquatic or human life.

Macroinvertebrate Sampling

Where these fundamentals, or most of them are in place, streams can sustain a range of aquatic life, making for a more sustainable waterway ecosystem. Macroinvertebrate sampling provides a sound indication of the level of biological health of the stream. Macroinvertebrates are a key element of the food chain as they eat plants and algae within the stream, as well as being eaten by larger invertebrates, which in turn are food for birds, platypus and fish. Macroinvertebrates are a group of animals without a backbone and include shrimps, snails, water fleas, worms and insects. They are useful biological indicators as they show a variation in tolerance to pollution with their relative abundance and the diversity of species present demonstrating relative pollution levels.

However, it should be noted that pollution is only one element affecting species presence. Variations in physical habitat can also be important, as can variations in stream temperatures of differing habitats.

The earliest biological sampling of the Merri Creek took place in 1974 (Public Interest Research Group [PIRG], 1975). It showed a marked deterioration in macroinvertebrate species abundance and diversity downstream of Mahoneys Road.

More recent studies have drawn similar conclusions. In 1990 Mitchell and Clark conducted a comprehensive macroinvertebrate study (Mitchell and Clark, 1991). It indicated some 39 discrete taxa of macroinvertebrates in the upper catchment areas.

There was also a major decline in communities beginning between O'Herns Road and Barry Road. This corresponded with declining water quality, especially increases in heavy metal

pollution within the water column and sediments (from Finlay, McGann and Roy, 1996).

Other Waterway Ecosystem Components

While macroinvertebrates are important in themselves for their role in the food chain and as a processor of leaf litter entering the stream, they are by no means the only component of the waterway ecosystem. Micro-organisms as well as the higher order animals such as fish, waterbirds, reptiles and amphibians and aquatic mammals are all important components.

Many of these have been poorly studied in the Merri system. Amongst the more notable species, it is thought from recent surveys (1995), that platypus is not resident in Merri Creek, although Beardsell (1997) reported a sighting upstream of Summerhill Road in 1991 (see section 2.1). However, Water Rats are still common (Melbourne Water, unpublished data, see Finlay, McGann and Roy, 1996, p. 119).

Waterway Ecosystem Degradation

Merri Creek shows indisputable evidence of a significant decline in the diversity of the waterway ecosystem due to:

- alterations to stream form (especially channelisation) causing loss of habitat niches;
- farming and urbanisation in the catchment;
- draining of wetlands;
- degradation of riparian vegetation (especially loss of overhanging Red Gums)
- increased incidence of exotic weed species;
- changes to stream flows; and
- increased inputs of pollutants, principally from stormwater.

Stream flows and their effects on the waterway ecosystem have also been inadequately studied along Merri Creek. In pre-European settlement times flows were probably minimal during late summer/autumn with the creek reduced to a series of pools. Today the effects of summer drying can be exacerbated by diversions for agricultural purposes in rural areas. In urban areas stormwater has both increased flows and velocities. The further removal of stream meanders has meant that quiet areas of water for fish breeding and habitat have been virtually lost in the lower catchment.

Fish Barriers

In addition, the creation of barriers in the form of Dights Falls, and the walls at Coburg and Edwardes Lakes have prevented fish migration upstream. Besides these there are a further 18 less significant barriers in Merri Creek (Doeg and Curmi, 1994 in Finlay, McGann and Roy, 1996). These barriers, plus the presence of pest exotic species such as Carp and Mosquitofish, have reduced the numbers of native fish in the stream, although perhaps surprisingly, Blackfish is still present in the upper catchment (Schulz and Webster, 1991).

Opportunities

While an attempt has been made to overcome the obstruction at Dights Falls with the installation of a fish ladder in recent years, additional modifications are still required to improve its function.

There are also other potential areas for improvement. For instance, the vegetative cover of the stream's banks can be changed and improved to provide better habitat for instream fauna. Some of this work has taken place through the MCMC over the last eight years. In addition, the persistence of some reasonably intact riparian scrub and grassy woodland/floodplain areas along the middle to upper reaches of the creek provide some basis for continuing this improvement to the riparian and stream corridor. It is also possible to reduce the incidence of litter in the stream and further reduce the incidence of organic pollutants and heavy metals.

Issues

- In established urban areas restoration of the waterway ecosystem is problematic due to:
  - the loss of the pool and run form of the stream;
  - increased waterway sheer forces due to urban runoff;
  - the difficulty in effectively treating urban stormwater so that the quality of water is capable of supporting a diverse ecosystem;
  - the nature of a fairly uniform, channelised stream without diverse habitat niches or wetlands;
  - constraints imposed on the nature and width of the waterway/floodplain corridor from intense urban development; and
  - the inability to always restore an adequate vegetative cover and habitat while providing for other functions desired by the community (eg. recreation).
- Opportunities for protection of the waterway ecosystem of the middle and upper catchment will require a thorough understanding of development impacts on waterway ecosystem degradation and implementation of planning and protection measures to ensure preservation of ecosystems to at least maintain their current condition.

- Before a serious program of waterway ecosystem restoration can begin some further studies are required including investigation into:
  - the current status of the instream ecosystem, including the available micro-habitat (riffles, pools, shaded areas);
  - the viability of habitat restoration and species re-introduction with possible trialing of habitats and model riparian zones;
  - the potential to mitigate impacts of changes in stream flow, particularly "bank full" discharge stage; and
  - the effects of the Dight Falls fish ladder on upstream migration of fish species in Merri Creek and the costs/benefits of further ladders at Coburg and Edwardes Lakes.

Objectives

- Protection of waterway ecosystems in the middle to upper catchment as a priority, so that, as a minimum, current conditions and waterway ecosystem health are maintained in those areas.

- Improvement of the waterway ecosystem in the urbanised lower reaches through addressing issues which are achievable and which might make the stream more naturally self-sustaining and healthy.

Action Program **Note:** * in accountable SA (Statutory Authority) or LGA (Local Government Authority) column = MCMC assigned responsibility for delivery of the action by that Council and P = partnership arrangement for delivery, usually between LGA and MCMC. Overall Notional Cost = combined notional cost of action for accountable parties. N/A = column heading is not applicable. Priority = the agreed priority attached to the action by the steering committee for the Strategy, which may differ from individual agency's timeframes for commencement of implementation of the action due to an agency's budgetary processes.

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
WES1	Review the roles of agencies and other relevant bodies in aquatic ecosystem management	DNRE, CALP, Water Reform Unit Treasury	MW		$	High
WES2	Survey and assess instream biota and habitat value	MW	DNRE MCMC		$$	Medium
WES3	Research habitat needs of indicator, depleted or key food-chain link species	DNRE	MW MCMC		$$	Medium
WES4	Research environmental flow requirements consistent with the requirements of the SEPP for the Waters of the Yarra catchment (Schedule F7), and investigate instream barriers, quarries and impoundments in the northern catchment for effects on environmental flows	MW	DNRE MCMC		$$	Medium
WES5	Carry out and monitor trials to recreate habitat of depleted species and communities	MW	DNRE, CRCs, MCMC		$$	Medium
WES6	Investigate extent and impacts of heavy metal buildup on streamlife and risk to humans from consumption of fish	EPA	MW, MCMC		$	Medium

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
WES7	Prepare an in-stream habitat improvement opportunities plan, including investigation of staged targets	MW	MCMC		$$	Medium
WES8	Implement an interim program of works to achieve short-term targets for habitat restoration prior to preparation of the above plan	MW	MCMC		$$	High
WES9	Investigate potential to modify existing lakes (Coburg, Edwardes and Jack Roper Reserve) to achieve improved habitat and fringing riparian vegetation	Hume, Darebin, Moreland	MCMC, MW		$	Medium
WES10	Investigate benefits for fish passage from construction of fish ladders at Coburg and Edwardes Lakes	DNRE, MW	MCMC, Moreland, Darebin		$$	Medium
WES11	Investigate the potential for reintroduction of platypus into areas of suitable habitat	MW, APC	DNRE MCMC		$	Low
WES12	Investigate the potential for reintroduction of appropriate native fish species (eg. Southern Pygmy Perch) into areas of suitable habitat	DNRE	MW, MCMC		$	Low
WES13	Investigate impacts from release of exotic fish at Coburg and Edwardes Lakes, especially on future release programs for native fish (eg. Galaxiids and Blackfish)	DNRE	MW, MCMC		$	Low

HEADWATERS TO CRAIGIEBURN ROAD EAST
Water Quality and Waterway Ecosystem

Relevant site specific and generic actions for the reach from Sections 3.2 and 3.3

WQ1 Extend Melbourne Water's Stream Frontage Management Program to rural areas of the Merri catchment

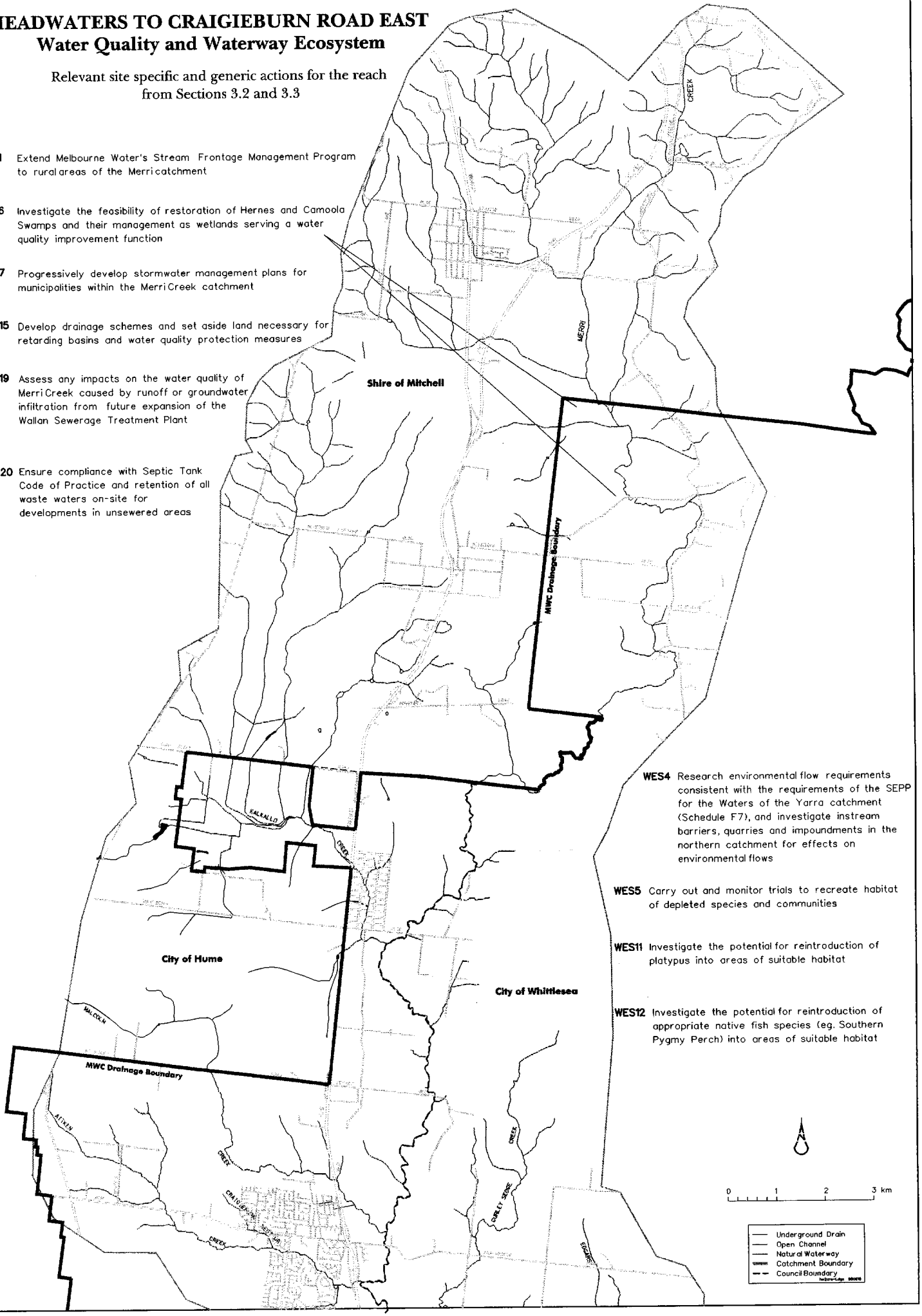
WQ6 Investigate the feasibility of restoration of Hernes and Camoola Swamps and their management as wetlands serving a water quality improvement function

WQ7 Progressively develop stormwater management plans for municipalities within the Merri Creek catchment

WQ15 Develop drainage schemes and set aside land necessary for retarding basins and water quality protection measures

WQ19 Assess any impacts on the water quality of Merri Creek caused by runoff or groundwater infiltration from future expansion of the Wallan Sewerage Treatment Plant

WQ20 Ensure compliance with Septic Tank Code of Practice and retention of all waste waters on-site for developments in unsewered areas

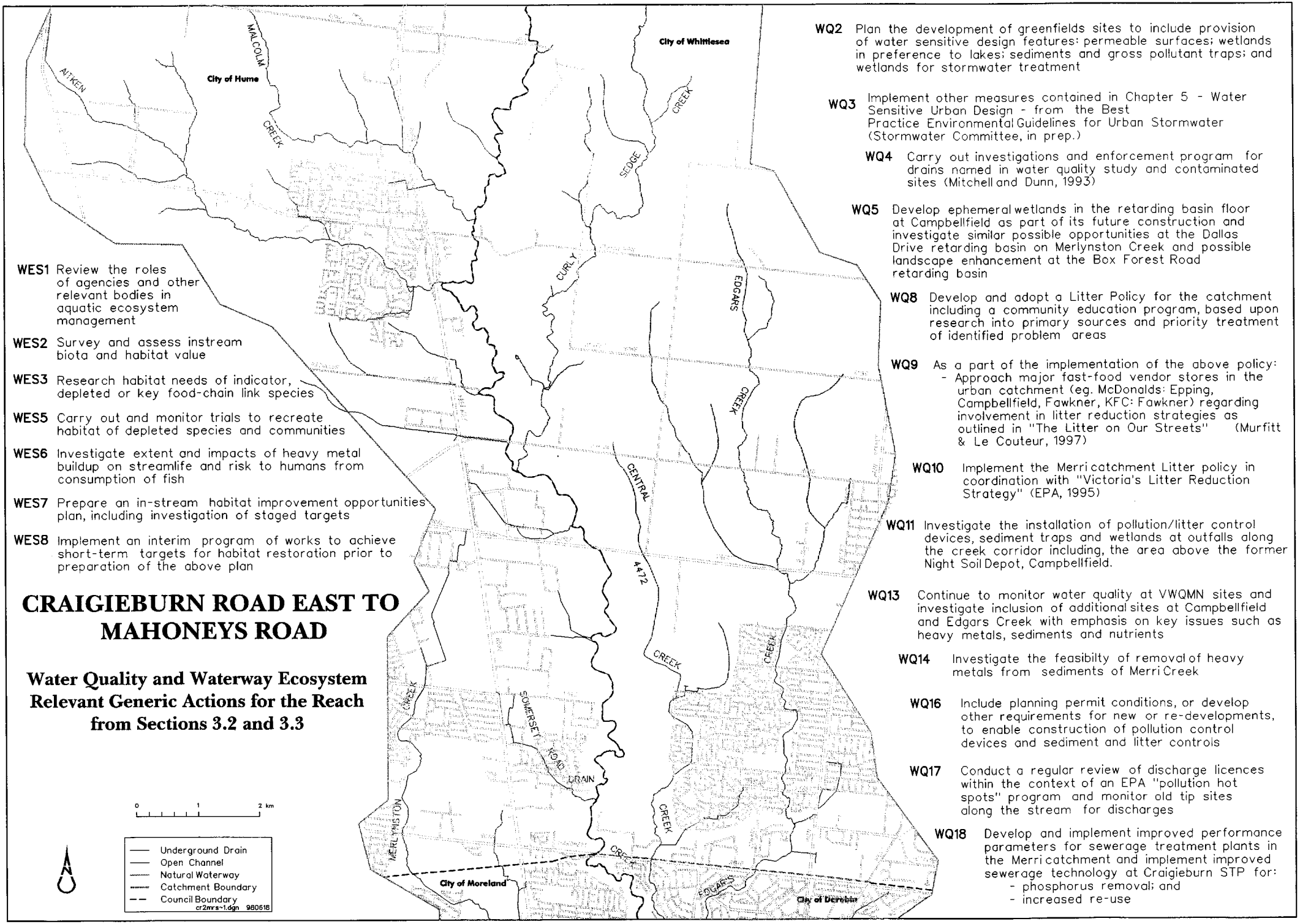


WES4 Research environmental flow requirements consistent with the requirements of the SEPP for the Waters of the Yarra catchment (Schedule F7), and investigate instream barriers, quarries and impoundments in the northern catchment for effects on environmental flows

WES5 Carry out and monitor trials to recreate habitat of depleted species and communities

WES11 Investigate the potential for reintroduction of platypus into areas of suitable habitat

WES12 Investigate the potential for reintroduction of appropriate native fish species (eg. Southern Pygmy Perch) into areas of suitable habitat



WES1 Review the roles of agencies and other relevant bodies in aquatic ecosystem management

WES2 Survey and assess instream biota and habitat value

WES3 Research habitat needs of indicator, depleted or key food-chain link species

WES5 Carry out and monitor trials to recreate habitat of depleted species and communities

WES6 Investigate extent and impacts of heavy metal buildup on streamlife and risk to humans from consumption of fish

WES7 Prepare an in-stream habitat improvement opportunities plan, including investigation of staged targets

WES8 Implement an interim program of works to achieve short-term targets for habitat restoration prior to preparation of the above plan

CRAIGIEBURN ROAD EAST TO MAHONEYS ROAD

Water Quality and Waterway Ecosystem Relevant Generic Actions for the Reach from Sections 3.2 and 3.3

WQ2 Plan the development of greenfields sites to include provision of water sensitive design features: permeable surfaces; wetlands in preference to lakes; sediments and gross pollutant traps; and wetlands for stormwater treatment

WQ3 Implement other measures contained in Chapter 5 - Water Sensitive Urban Design - from the Best Practice Environmental Guidelines for Urban Stormwater (Stormwater Committee, in prep.)

WQ4 Carry out investigations and enforcement program for drains named in water quality study and contaminated sites (Mitchell and Dunn, 1993)

WQ5 Develop ephemeral wetlands in the retarding basin floor at Campbellfield as part of its future construction and investigate similar possible opportunities at the Dallas Drive retarding basin on Merlynston Creek and possible landscape enhancement at the Box Forest Road retarding basin

WQ8 Develop and adopt a Litter Policy for the catchment including a community education program, based upon research into primary sources and priority treatment of identified problem areas

WQ9 As a part of the implementation of the above policy:
- Approach major fast-food vendor stores in the urban catchment (eg. McDonalds: Epping, Campbellfield, Fawkner, KFC: Fawkner) regarding involvement in litter reduction strategies as outlined in "The Litter on Our Streets" (Murfitt & Le Couteur, 1997)

WQ10 Implement the Merri catchment Litter policy in coordination with "Victoria's Litter Reduction Strategy" (EPA, 1995)

WQ11 Investigate the installation of pollution/litter control devices, sediment traps and wetlands at outfalls along the creek corridor including, the area above the former Night Soil Depot, Campbellfield.

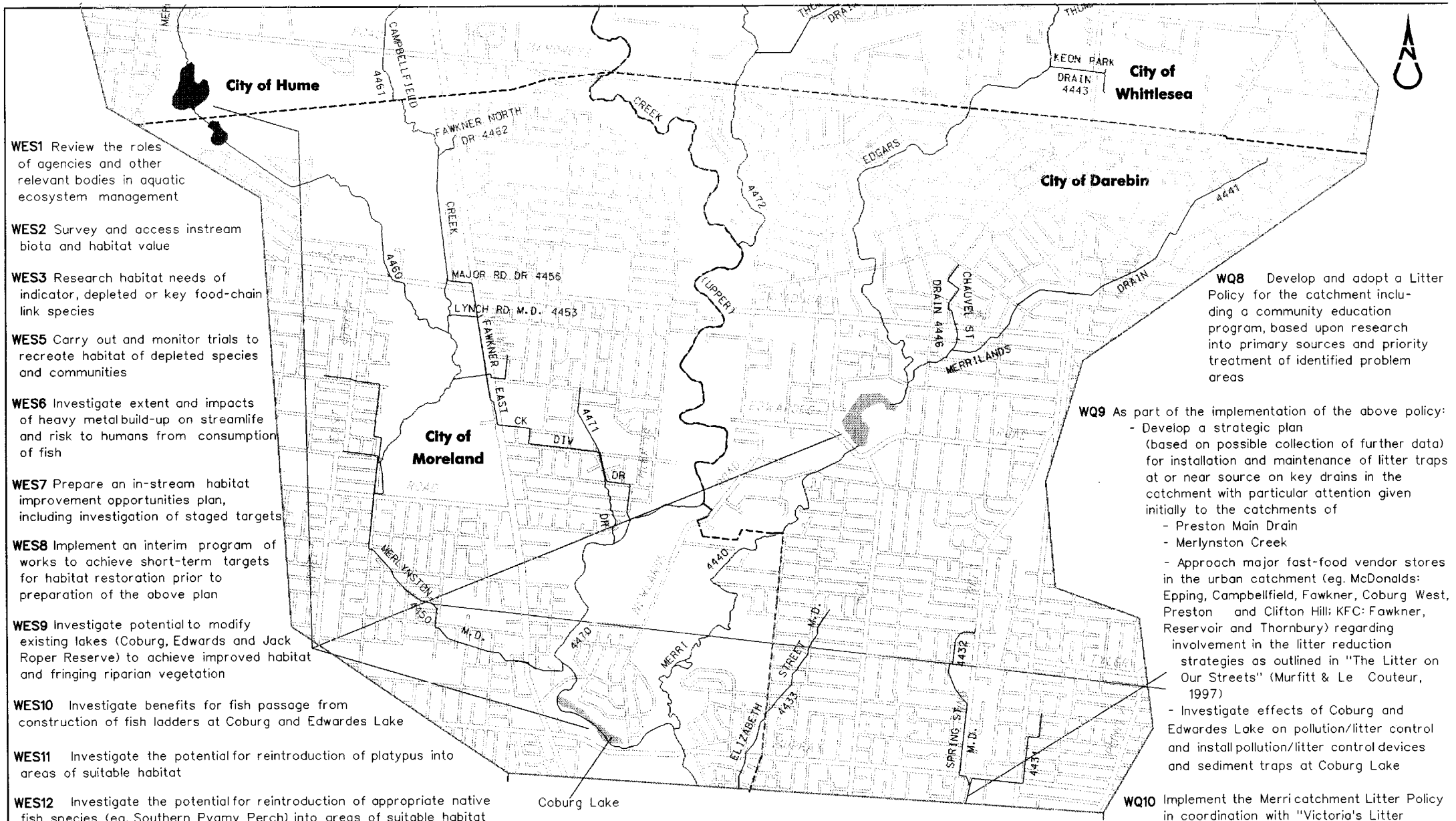
WQ13 Continue to monitor water quality at VWQMN sites and investigate inclusion of additional sites at Campbellfield and Edgars Creek with emphasis on key issues such as heavy metals, sediments and nutrients

WQ14 Investigate the feasibilty of removal of heavy metals from sediments of Merri Creek

WQ16 Include planning permit conditions, or develop other requirements for new or re-developments, to enable construction of pollution control devices and sediment and litter controls

WQ17 Conduct a regular review of discharge licences within the context of an EPA "pollution hot spots" program and monitor old tip sites along the stream for discharges

WQ18 Develop and implement improved performance parameters for sewerage treatment plants in the Merri catchment and implement improved sewerage technology at Craigieburn STP for:
- phosphorus removal; and
- increased re-use



WES1 Review the roles of agencies and other relevant bodies in aquatic ecosystem management

WES2 Survey and access instream biota and habitat value

WES3 Research habitat needs of indicator, depleted or key food-chain link species

WES5 Carry out and monitor trials to recreate habitat of depleted species and communities

WES6 Investigate extent and impacts of heavy metal build-up on streamlife and risk to humans from consumption of fish

WES7 Prepare an in-stream habitat improvement opportunities plan, including investigation of staged targets

WES8 Implement an interim program of works to achieve short-term targets for habitat restoration prior to preparation of the above plan

WES9 Investigate potential to modify existing lakes (Coburg, Edwards and Jack Roper Reserve) to achieve improved habitat and fringing riparian vegetation

WES10 Investigate benefits for fish passage from construction of fish ladders at Coburg and Edwardes Lake

WES11 Investigate the potential for reintroduction of platypus into areas of suitable habitat

WES12 Investigate the potential for reintroduction of appropriate native fish species (eg. Southern Pygmy Perch) into areas of suitable habitat

WES12 Investigate impacts from release of exotic fish at Coburg and Edwardes Lakes, especially on future release programs for native fish (eg. Galaxiids and Blackfish)

WQ8 Develop and adopt a Litter Policy for the catchment including a community education program, based upon research into primary sources and priority treatment of identified problem areas

WQ9 As part of the implementation of the above policy:

- Develop a strategic plan (based on possible collection of further data) for installation and maintenance of litter traps at or near source on key drains in the catchment with particular attention given initially to the catchments of
  - Preston Main Drain
  - Merlynston Creek
- Approach major fast-food vendor stores in the urban catchment (eg. McDonalds: Epping, Campbellfield, Fawkner, Coburg West, Preston and Clifton Hill; KFC: Fawkner, Reservoir and Thornbury) regarding involvement in the litter reduction strategies as outlined in "The Litter on Our Streets" (Murfitt & Le Couteur, 1997)
- Investigate effects of Coburg and Edwardes Lake on pollution/litter control and install pollution/litter control devices and sediment traps at Coburg Lake

WQ10 Implement the Merri catchment Litter Policy in coordination with "Victoria's Litter Reduction Strategy". (EPA, 1995)

WQ3 Implement other measures contained in Chapter 5 - Water Sensitive Urban Design - from the Best Practice Environmental Management Guidelines for Urban Stormwater (Stormwater Committee, in prep.)

WQ4 Carry out investigations and enforcement program for drains named in water quality study and contaminated sites (Mitchell and Dunn, 1993)

WQ7 Progressively develop stormwater management plans for municipalities within the Merri Creek catchment

WQ11 Investigate the installation of pollution/litter control devices, sediment traps and wetlands at outfalls along the creek corridor including lower Central Creek.

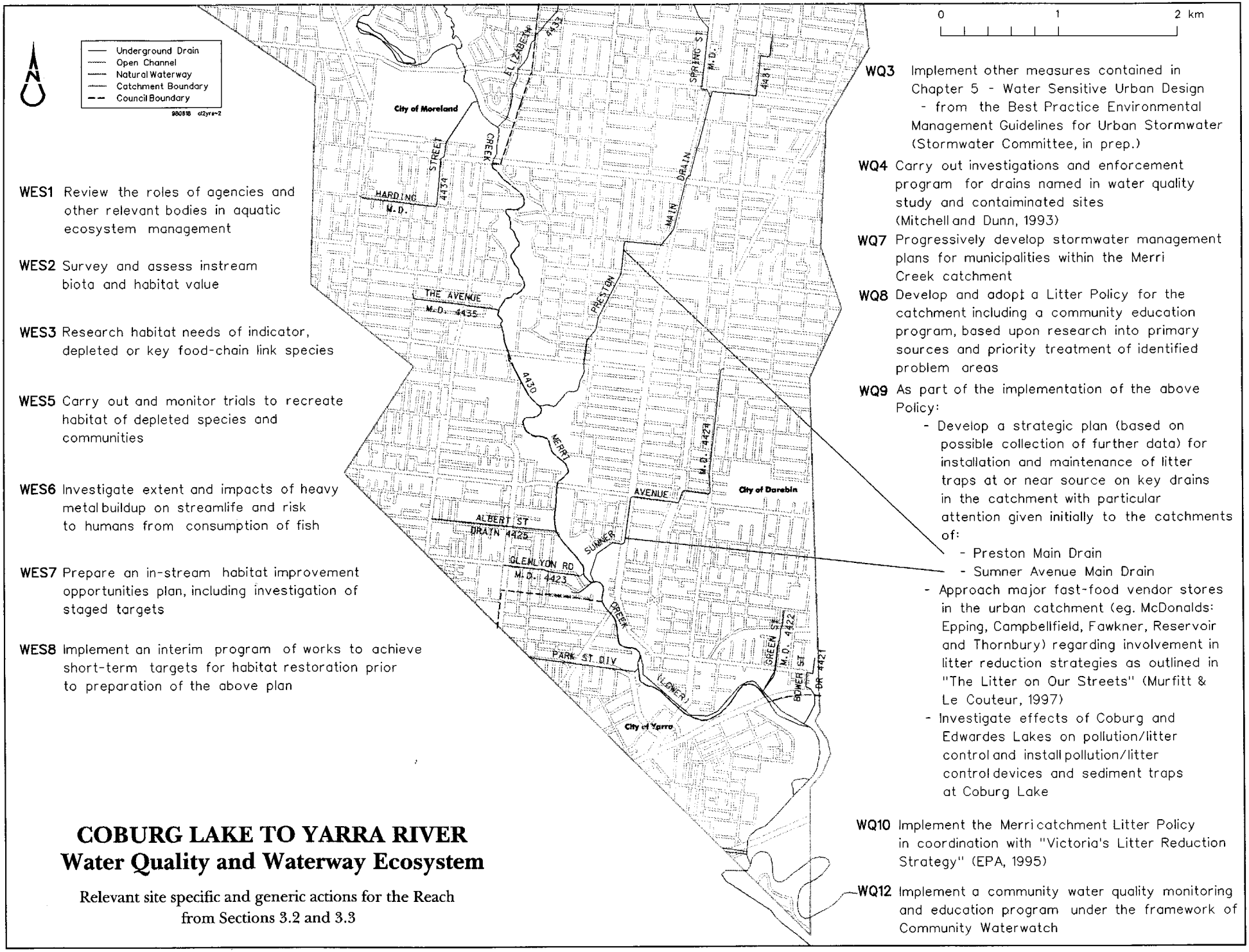
0 1 2 km

Underground Drain
Open Channel
Natural Waterway
Catchment Boundary
Council Boundary

980618 mr2cle-3

MAHONEYS ROAD TO COBURG LAKE
Water Quality and Waterway Ecosystem

Relevant site specific and generic actions for the reach from Sections 3.2 and 3.3



WES1 Review the roles of agencies and other relevant bodies in aquatic ecosystem management

WES2 Survey and assess instream biota and habitat value

WES3 Research habitat needs of indicator, depleted or key food-chain link species

WES5 Carry out and monitor trials to recreate habitat of depleted species and communities

WES6 Investigate extent and impacts of heavy metal buildup on streamlife and risk to humans from consumption of fish

WES7 Prepare an in-stream habitat improvement opportunities plan, including investigation of staged targets

WES8 Implement an interim program of works to achieve short-term targets for habitat restoration prior to preparation of the above plan

WQ3 Implement other measures contained in Chapter 5 - Water Sensitive Urban Design - from the Best Practice Environmental Management Guidelines for Urban Stormwater (Stormwater Committee, in prep.)

WQ4 Carry out investigations and enforcement program for drains named in water quality study and contaiminated sites (Mitchell and Dunn, 1993)

WQ7 Progressively develop stormwater management plans for municipalities within the Merri Creek catchment

WQ8 Develop and adopt a Litter Policy for the catchment including a community education program, based upon research into primary sources and priority treatment of identified problem areas

WQ9 As part of the implementation of the above Policy:

- Develop a strategic plan (based on possible collection of further data) for installation and maintenance of litter traps at or near source on key drains in the catchment with particular attention given initially to the catchments of:
  - Preston Main Drain
  - Sumner Avenue Main Drain
- Approach major fast-food vendor stores in the urban catchment (eg. McDonalds: Epping, Campbellfield, Fawkner, Reservoir and Thornbury) regarding involvement in litter reduction strategies as outlined in "The Litter on Our Streets" (Murfitt & Le Couteur, 1997)
- Investigate effects of Coburg and Edwardes Lakes on pollution/litter control and install pollution/litter control devices and sediment traps at Coburg Lake

WQ10 Implement the Merri catchment Litter Policy in coordination with "Victoria's Litter Reduction Strategy" (EPA, 1995)

WQ12 Implement a community water quality monitoring and education program under the framework of Community Waterwatch

COBURG LAKE TO YARRA RIVER
Water Quality and Waterway Ecosystem

Relevant site specific and generic actions for the Reach from Sections 3.2 and 3.3

PART C - COMMUNITY

Section 4 - Recreation and Community Involvement

4.1 Recreation

Background

Through the development of the creek's open space to cater for passive recreation needs, the creek corridor provides many opportunities for outdoor recreation in natural and semi natural settings.

Within the inner northern suburbs especially, this natural setting provides a rare opportunity to escape from the surrounding urban environment. The local community has given a clear indication of its support for a continuation of the provision of passive recreation opportunities along the waterway (refer to table next page).

There are opportunities associated with existing sporting facilities and grounds to provide for further buffering of the creek open space from nearby development.

The population in the Merri Creek catchment is growing, especially in the municipalities of Hume and Whittlesea. The Creek's open space has the potential to become an important recreation resource for the outer suburban municipalities, just as they are at present for those closer to the Melbourne.

Issues

- The achievement of a balance between facilities and opportunities for intensive recreation, and less intensive use and conservation areas will be required to meet diverse community needs.
- Merri Creek is under-utilised for recreation.
- Traditionally, within the recreation provision spectrum, allocation of services and funding has generally favoured development and maintenance of active sporting recreation facilities to the detriment of passive recreation.

Objectives

- Increased use and appreciation of the creek environment by all communities through providing primarily passive recreation opportunities and programs compatible with the particular waterway setting.
- Fair access to recreation opportunities along the corridor for a spectrum of community needs - the aged, children, disabled, non-english speaking background or other user groups.

Importance of Features to the Enjoyment of Merri Creek and Surrounding Open Space (Source: Bruce, 1993)

	Very Important (%)	Important (%)	Not Very Important (%)	Not at all Important (%)	Don't Know (%)
The creek	66	25	4	0	5
Trees	64	29	4	0	5
Wildlife (including birds)	59	29	1	1	6
Bushland	52	33	6	1	7
Walking track and trails	52	36	5	1	10
Nature/conservation areas	47	37	5	1	10
Appearance/vistas	45	39	6	1	10
Bicycle/walking tracks	43	40	8	1	8
Plenty of Space	39	43	10	1	7
Other water features	36	37	11	1	14
Lawn Areas	35	36	19	3	7
Bike Tracks	29	35	22	5	9
Scenic vistas	29	47	11	2	10
Not crowded	28	40	20	3	10
Barbecue/picnic areas	24	36	24	8	8
Sports grounds and reserves	12	33	29	17	10
Ball games areas	11	30	34	16	9
Golf courses	7	11	24	46	13

Action Program **Note:** * in accountable SA (Statutory Authority) or LGA (Local Government Authority) column = MCMC assigned responsibility for delivery of the action by that Council and P = partnership arrangement for delivery, usually between LGA and MCMC. Overall Notional Cost = combined notional cost of action for accountable parties. N/A = column heading is not applicable. Priority = the agreed priority attached to the action by the steering committee for the Strategy, which may differ from individual agency's timeframes for commencement of implementation of the action due to an agency's budgetary processes.

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
R1	In accordance with the revised Merri Creek Plan (1987), continue to develop creek open space on Council owned land for passive recreation activities (eg. walking, cycling and observing nature).	Whittlesea, Hume, Darebin, Moreland, Yarra	MCMC	✓	$$$	High
R2	Promote the passive recreation potential and use of the creek corridor parklands through: • community events; • festivals; • interpretation of natural and cultural features.	Whittlesea*, Hume[P], Darebin*, Moreland*, Yarra[P]	MCMC, CERES, FOMC	✓	$	Medium
R3	Conduct programs for users not normally catered for, eg. elderly, non english speaking background, people with disabilities.	Whittlesea, Hume, Darebin, Moreland*, Yarra*	MCMC, FOMC	✓	$$	Low
R4	Develop programs which utilise the waterway's passive open space, eg.: • school holiday programs; • group excursions; • activity days; • fun runs.	Whittlesea, Hume[P], Darebin, Moreland, Yarra[P]	MCMC, CERES, FOMC	✓	$$	Medium
R5	Investigate provision of environmental and interpretive programs for: • special interest groups; • environment monitoring; • planting days	Whittlesea*, Hume[P], Darebin*, Moreland*, Yarra*	MCMC, CERES	✓	$	Medium
R6	In accordance with the revised Merri Creek Plan (1987), develop sportsground perimeters on Council land as passive open space with a natural theme to complement the creek and its open space	Darebin, Moreland, Yarra	MCMC, Sporting Clubs	✓	$$	Medium

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
R7	Develop facilities and provide access to the creek open space for residents of Roxburgh Park and Craigieburn through Aitken and Malcolm Creeks and investigate use of Patullos Lane	Hume	MCMC		$$	Low
R8	Investigate development of areas for "wild & informal" bush play	Whittlesea, Hume[P], Darebin, Moreland, Yarra[P]	MCMC	✓	$	Medium
R9	Provide water based passive recreation opportunities at Jack Roper Reserve and Coburg and Edwardes Lakes	Hume, Moreland, Darebin	MCMC	✓	$	Medium
R10	In accordance with Council policy, introduce or enforce pet control by-laws requiring pets to be on leads within public lands along the Merri Creek corridor, except at otherwise designated sites	Whittlesea, Hume, Darebin, Moreland, Yarra	MCMC	✓	$	High

4.2 Trails and Access

Background

The Merri Path currently extends from Mahoneys Road in Fawkner to the Yarra River. Many sections of the path were first designed and constructed in the early to mid 1980s. At that time design standards for paths were in their infancy and as a consequence many sections of today's Merri Path are not of a uniform quality or design. In particular, some sections north of Coburg Lake are of poor standard consisting of unsafe granitic sand, toppings and mulch. Moreland Council has progressively been replacing sections of non-hard surface path upstream of Coburg Lake over recent years. Re-laid path now extends to Ida Street North Coburg, with immediate plans for an extension to Queens Parade, Fawkner.

Besides improvement to trail surface, these northern sections of the Merri Path require further links to other trails and open space networks.

Further downstream, where there has perhaps been more resources given to open space development, the trail is generally of a moderate to high standard, with only some sections of unsafe or below standard concrete path.

In a small number of cases the trail is diverted to adjacent roads and sometimes main roads are used to establish crossing points. These diversions can interrupt the experience of travelling within the creek valley.

Directional signage is also either confusing or absent at certain locations. There is also potential for improving physical access to the creek corridor. Resolving these matters might also incorporate signage giving direction to features and nearby places and facilities. This would assist and benefit first-time users especially.

Improvements to the Merri Path should begin with consideration of the least safe sections and focus on development along the main stem of the creek rather than path works on tributaries. The path should be constructed to full design specifications on one side of the creek only at any given point. Consequently, additional paths on the other side of the creek would: be discouraged; not be formally sanctioned; and not subject to maintenance given their informal status.

In areas where the renovation or relocation of the path is deemed desirable, consideration needs to be given to its siting above the 5 year floodline, as a minimum, to improve safety for users and reduce maintenance costs. Melbourne Water has recently developed a guidelines and criteria document to guide path design for these and other matters. In addition, planning of the path's location should include investigation of impacts on Aboriginal or European heritage sites, minimisation of damage to flora or fauna and avoidance of other authority's infrastructure.

Formal planning permit applications are encouraged so that appropriate parties are provided with an opportunity to comment on path proposals. This is especially necessary where new sections of path are to be planned beyond its current limits. Planning of paths in these areas will need to take into account a host of factors including land ownership and approved land uses such as quarries.

As paths are constructed to a higher standard increased usage can be anticipated. Since the Merri Path was first constructed, it has been demonstrated that high use of paths generates its own problems, particularly with speeding cyclists and inconsiderate or unauthorised users. A number of pedestrians have sustained injuries as a result. To address these problems, path design should incorporate the need to slow cyclists and not provide long straight sections which encourage speeding cyclists and perhaps even unauthorised use (eg. trail bikes). Resourcing of community education about considerate use of the path is also required.

Issues

- The trail is not always located off-road and is sub-standard and unsafe in places. On-road sections disrupt the quality of the trail as a haven from city stress, traffic hazards, and noise.

- The location of the Merri Path at certain locations (eg. Fawkner and under some road bridges) is unsafe as it is below the 1 in 5 year floodline. Any renovation of the path through such areas will be required to meet Melbourne Water design and safety criteria.

- The location of the trail within the 1% flood zone increases maintenance requirements and costs, particularly if the trail is not constructed of concrete.

- Location of the path adjacent to the stream can limit opportunities for stream rehabilitation and improvement of the riparian fringe and habitat. Consideration thus needs to be given to use of ridge lines and other higher vantage points out of the floodplain. These factors especially need to be taken into account where path renovation and relocation is under consideration.

- Access to the creek corridor and progress along the trail is hampered by inadequate signage and a lack of "gateway" areas.

- Privately owned frontages in the upper catchment can limit access to the creek corridor.

- The trail is popular with walkers and cyclists, but the interests of the two groups are not always compatible, especially where cyclists do not display due care for pedestrians.

- The trail has barriers to wheelchairs and pushers - for the elderly and young children these should be minimised.

- Provision of vehicular access must allow for management by a range of authorities but must restrict access to trail bikes, "joyriders" in cars and for rubbish dumping.

Objectives

- Development of a continuous, off-road shared pathway of consistent and safe design standard on either, but not both sides of, Merri Creek from Craigieburn to the Yarra River.

- Development of a continuous walking path from the Yarra River to the head waters of the Merri Creek.

- Development of trail links between Merri Creek and new and existing trails, public transport routes, roads and other open space areas as development proceeds in the northern suburbs and opportunities arise.

- Preservation of environmentally sensitive areas by directing recreational users to more appropriate areas.

- Provision of a safe environment for the needs of pedestrians and cyclists.

- Promotion of safety and courtesy between cyclists and pedestrians and provision of information about the trail network through the production of guides.

- Provision of access points, paths and facilities for disabled and special need users, consistent with open space management zone objectives.

Action Program **Note:** * in accountable SA (Statutory Authority) or LGA (Local Government Authority) column = MCMC assigned responsibility for delivery of the action by that Council and **P** = partnership arrangement for delivery, usually between LGA and MCMC. Overall Notional Cost = combined notional cost of action for accountable parties. N/A = column heading is not applicable. Priority = the agreed priority attached to the action by the steering committee for the Strategy, which may differ from individual agency's timeframes for commencement of implementation of the action due to an agency's budgetary processes.

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
TA1	Publish a map of the Merri Creek and its open space showing: • entry points/public facilities; • transport routes.	Whittlesea*, Hume*, Darebin*, Moreland*, Yarra*	MCMC BUG	✓	$	High
TA2	Prepare a signage plan for the Merri Creek parklands to facilitate consistency of approach to signage.	Whittlesea*, Hume*, Darebin[P], Moreland*, Yarra*	FOMC, MCMC, BUG	✓	$	High
TA3	In accordance with the Metropolitan Signage Strategy, and in line with the above Plan, as opportunities arise through specific site works, put in place clear signage along Creek including: • access/exit points and links to other trails along waterways and rail lines; • shared trail designation; • directions to facilities near the creek; • directions from major roads.	Whittlesea, Hume, Darebin, Moreland, Yarra[P]	MCMC BUG	✓	$$	High
TA4	Prepare plans for disabled access in consultation with interest groups, following assessment of areas requiring improvement, especially steep grades.	Hume*, Moreland, Darebin, Yarra*	MCMC	✓	$$	High
TA5	Implement disabled access proposals as opportunities arise on Council owned land	Hume, Darebin, Moreland, Yarra	MCMC	✓	$$	Medium
TA6	Investigate opportunities for bush walking/trekking trails and links and overnight camping areas between Beveridge and Wallan and Craigieburn	Mitchell, Whittlesea, Hume*	MCMC	✓	$	Low
TA7	Examine opportunities for development of a trail between Craigieburn and Campbellfield	Whittlesea, Hume	PV VicRoads MCMC	✓	$	High
TA8	Investigate the extension of the Merri Path between Hatty Court and Mahoneys Road and within the Campbellfield Retarding Basin	Hume, Whittlesea	MW, MCMC, WTLCCHC		$	Medium

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
TA9	Upgrade Merri Path between the Metropolitan Ring Road and Coburg Lake	Moreland, Darebin	MCMC		$$$	Medium
TA10	Establish links to other trails or potential trails: • Malcolm Creek; • Aitken Creek; • Roxburgh Park; • Metropolitan Ring Road; • Merlynston Creek	Hume, Whittlesea, Moreland	MCMC, VicRoads	✓	$$$	Low
TA11	Develop detailed plans for public access along Edgars Creek	Moreland, Darebin	MW, MCMC		$	High
TA12	Develop trail link from Merri Creek along Edgars Creek to Edwardes Lake	Moreland, Darebin	MW, MCMC		$$$	Medium to High
TA13	Provide access from Moreland City College to Merri Path	Moreland	MCMC, Moreland City College		$$	Medium
TA14	Provide access to the Moonee Ponds Creek trail from Rennie Street, Coburg	Moreland	MCMC		$$	High
TA15	Repair stabilisation work under and upstream of Arthurton Road, Northcote	MW	Moreland, Darebin		$	High
TA16	Resolve route and construct off road trail between Rushall Station and St Georges Road	Yarra, Darebin	MCMC	✓	$$	Medium
TA17	Provide improved link to Inner Circle and Capital City Trail	Yarra	MCMC		$$	Medium
TA18	Conduct a review of path locations, width and crossings to assess safety for all users, (especially in flood events - see also PS3) and develop a program to address its recommendations	Moreland, Darebin, Yarra	MW MCMC	✓	$$	High
TA19	Relocate Merri Path between St. Georges Road and Ida Street, Brunswick above flood level to reduce incidence of flooding and improve riparian fringe	Moreland	MW, MCMC		$$$	Medium
TA20	Improve safety of Merri Path under Heidelberg Road, Clifton Hill	Yarra	MCMC		$$	Medium

4.3 Public Safety

Background

There are a number of different aspects of public safety for users of Merri Creek and its open space. One aspect is the risk of attack from other people or from unrestrained dogs. This is also a real fear of the creek open space for unaccompanied users, which detracts from the atmosphere of tranquillity the creek environment can otherwise convey.

Further, there is a public perception that the Merri Creek, particularly at certain times (eg. night time), and in some isolated locations, may be unsafe, especially for women or children. However, there is no available data to support a position that Merri Creek is any more, or any less safe, than other open space areas.

Careful design of plantings and facilities may improve some aspects of safety but will not remove altogether the risk of personal injury or attack from dogs or other humans. A possible solution to public safety concerns will be provision of information to users of any known dangers or hazards, increased policing and surveillance, and encouragement of safe practices by users to reduce risks.

Safety covers a range of other potential issues associated with use of the waterway and its open space. These can relate to safe use of the path by cyclists so that pedestrians are not put at risk of injury and location of paths and crossings out of the floodplain so that users are not exposed to risk during flood events.

Urban residential area which abut waterways are always likely to have snake populations. Although residential areas along Merri Creek are not subject to the same snake numbers as streams further west, public concern is an issue which needs to be recognised and managed. As snakes are an integral part of a waterway environment, a key element of the fauna of the grassy woodlands of the Merri corridor and a protected wildlife species, their protection is important. The provision of information to residents close to Merri Creek about these issues and ways in which they can make their properties unattractive for snake habitat is essential for better management of public concerns.

Issues

- Personal safety is of concern to a significant number of creek open space users and must be taken into account in planning the development of open space.

- Hazards such as fire and snakes which result from weed growth, rubbish dumping and habitat provision can cause concerns amongst some people, especially those living in nearby areas.

- Increased lighting is often suggested as a solution to some safety concerns. However, it may be unwarranted where there are few after-dark users of open space and where it is likely to have detrimental impacts on habitat values of the creek corridor.

Objectives

- Creation of a safe environment through all reasonable and practical means including design, maintenance, surveillance and information.

- Involvement of the community in promoting sensible behaviour and safe use practices.

Action Program **Note:** * in accountable SA (Statutory Authority) or LGA (Local Government Authority) column = MCMC assigned responsibility for delivery of the action by that Council and P = partnership arrangement for delivery, usually between LGA and MCMC. Overall Notional Cost = combined notional cost of action for accountable parties. N/A = column heading is not applicable. Priority = the agreed priority attached to the action by the steering committee for the Strategy, which may differ from individual agency's timeframes for commencement of implementation of the action due to an agency's budgetary processes.

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
PS1	Implement a "Merri Watch" program for: • rubbish dumping; • unrestrained dogs (especially those unregistered); • trail bike surveillance and reporting; and • public safety.	Whittlesea, Hume, Moreland, Darebin, Yarra*	MCMC, MW, VicPolice	✓	$	Medium
PS2	Promote provision of boulevard roads in design of new urban and industrial developments near the creek so surveillance is possible from adjacent housing (see further section 5.1)	Whittlesea, Hume, Moreland, Darebin, Yarra	MW, MCMC		$	High
PS3	Construct and maintain Council facilities (eg. paths, crossings) to required standards (eg. paths above 5 year floodline, crossings above 10 year floodline where velocity and depth criteria can be met), in order to reduce exposure to risks, especially those associated with flood events (see also TA18).	Whittlesea, Hume, Moreland, Darebin, Yarra[P]	MW MCMC		$	High
PS4	Develop major open space nodes (see section 2.3), to encourage a focus of use at those locations and therefore improve perceived security	Moreland, Darebin, Yarra	MCMC	✓	$	High
PS5	Research available data on safety in public open space, including former quarries and fill areas	Whittlesea*, Hume*, Moreland, Darebin*, Yarra*	MCMC	✓	$	High
PS6	Undertake periodic discussions with Police through existing By-Laws officer forums or others, to ascertain current patrols of Creek open space, communicate matters requiring attention and seek increase in patrols as required	Whittlesea, Hume[P], Moreland, Darebin, Yarra	MCMC, VicPolice	✓	$	High

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
PS7	Investigate appointment of rangers for the creek corridor	Whittlesea*, Hume, Moreland, Yarra	MCMC	✓	$	Low
PS8	Install lighting at public access areas intended for some use at night (eg. at public transport points), ensuring that it does not reduce habitat values	Moreland, Darebin, Yarra	MCMC	✓	$$	High
PS9	Investigate installation of lighting at public access areas where and when needs arise, ensuring that it does not reduce habitat values	Hume	MCMC	✓	$	Low
PS10	Involve the community, where possible, in open space design and development to achieve outcomes supported by the community and improve community desire to care for waterway open space	Whittlesea, Hume, Moreland, Darebin, Yarra	MCMC	✓	$	High
PS11	Include signage along the creek which indicates, where possible, nearest safe area, telephone, water and toilets	Whittlesea*, Hume, Moreland, Darebin, Yarra*	MCMC	✓	$$	Medium
PS12	Include in any review of Merri Path (see TA18) investigation of unsafe bicycle use, the extent of threat to pedestrian safety and recommendations to overcome these problems through improvement to design (especially where path renovation is undertaken), cyclist education or other means	Hume, Moreland, Darebin, Yarra	MCMC	✓	$$ (can be covered under TA18)	High
PS13	Council By-Law Officers increase surveillance of creek corridor to address problems of unrestrained and unregistered dogs	Whittlesea, Hume, Moreland, Darebin, Yarra	MCMC		$	High

4.4 Community Involvement and Education

Background

During the last two decades there have been high levels of community involvement in a range of activities associated with Merri Creek. The community sector has been voluntarily involved in the operation of both the Merri Creek Coordinating and Management Committees and in research, lobbying and direct action, as well as planting, weeding, rubbish collection and conducting community festivals. Since its formation in 1988, much of this community involvement has come through Friends of Merri Creek.

Community participation is highly desirable as it has many potential benefits. These include the achievement of better outcomes from decision-making forums as well as the generation of a sense of personal commitment to the care of waterway open space through participation in works to achieve its improvement. In order to sustain high levels of community involvement, it is necessary to provide opportunities for involvement to a wide cross-section of the community.

It is also important for agencies and others involved in the planning of major works to ensure that the community sector has sufficient opportunities to be consulted about proposals so that works can be better developed to meet the needs of local communities. It is often necessary for such consultation exercises to deliberately target groups who might normally be unable to access such processes (eg. Non-English Speaking Background [NESB] communities, or the Aboriginal community).

In addition to the work of Friends of Merri Creek, the MCMC has also conducted a number of community involvement and education programs, particularly during the period of the Federally funded Jobskills program in the early to mid 1990s. These succeeded in attracting community interest from a diverse range of groups (especially NESB) and have focussed on issues culturally relevant to the participating group, and those which engender group commitments to activity.

Given the length and linear nature of the creek corridor, it is recognised as desirable to encourage the formation of local interest or Friends groups allied to particular areas of open space. It would be hoped that such groups might either form with the assistance of Friends of Merri Creek, or be aligned with them to help sustain their local activities.

Issues

- The community has demonstrated a resource of skills and knowledge and a desire for involvement which should be drawn upon to assist the development and management of Merri Creek and its open space.
- While MCMC has been able to conduct a number of community education programs in recent years, apart from the voluntary efforts of Friends of Merri Creek, there are few other resources directed to those ends.
- The sustaining of community involvement requires adequate resourcing and consistent inputs for the ongoing support of community groups, as well as for education and recreation programs relevant to the needs and interests of the local community.

Objectives

- The placing of greater value on the Merri Creek and its open space by the community through:
  - provision of information;
  - consultation; and
  - community education and involvement programs.
- Responsiveness by agencies to views from the community.
- Involvement of the community in planning, decision making and management processes.
- Promotion of a conservation ethic to the community.
- The development and conduct of programs for NESB people.
- Consultation with relevant Koori groups/agencies eg: AAV, AAL, WTLCCHC.

Action Program **Note:** * in accountable SA (Statutory Authority) or LGA (Local Government Authority) column = MCMC assigned responsibility for delivery of the action by that Council and P = partnership arrangement for delivery, usually between LGA and MCMC. Overall Notional Cost = combined notional cost of action for accountable parties. N/A = column heading is not applicable. Priority = the agreed priority attached to the action by the steering committee for the Strategy, which may differ from individual agency's timeframes for commencement of implementation of the action due to an agency's budgetary processes.

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
CIE1	Develop community liaison and participation in major events such as Arbor Week, Spring Planting Festival, Clean up Australia Day	Whittlesea, Hume[P], Moreland*, Darebin, Yarra[P]	MCMC, PV, FOMC	✓	$$$	High
CIE2	Support the operation and promotion of a Friends of Merri Creek, as part of support for MCMC, in order to provide additional community involvement activities (eg. planting days, litter collection, walks and talks etc.)	Whittlesea, Hume*, Moreland, Darebin, Yarra*	MCMC, FOMC, PV (through Community Grants)	✓	$$	High
CIE3	Support the establishment of smaller site or purpose specific community groups to achieve local open space development purposes	Whittlesea, Hume[P], Moreland*, Darebin, Yarra[P]	MCMC, PV, FOMC	✓	$	High
CIE4	Develop recreation and education programs using the creek environment and focussing on themes such as: • history; • geological sites; and • environmental monitoring.	Whittlesea*, Hume[P], Moreland*, Darebin*, Yarra*	MCMC, CERES, FOMC	✓	$$	High
CIE5	Develop and implement education programs for people of Non-English Speaking Background and other target user groups (see also R3)	Whittlesea, Hume[P], Moreland*, Darebin[P], Yarra*	MCMC, PV, CERES, FOMC	✓	$$	Medium
CIE6	Develop and implement school liaison and environmental education programs (eg. Community Waterwatch)	Whittlesea*, Hume[P], Moreland*, Darebin*, Yarra*	MCMC, PV, CERES	✓	$	High
CIE7	Facilitate establishment of Landcare groups in the rural northern catchment	DNRE	Whittlesea, Hume, MCMC		$	Medium
CIE8	Promote existing facilities and open space areas along the creek corridor by improved community information	Moreland, Darebin, Yarra*	MCMC, FOMC	✓	$$	High

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
CIE9	Seek representation on advisory and management groups from Aboriginal and ethnic communities	Whittlesea, Hume[P], Moreland, Darebin, Yarra	MCMC, FOMC	✓	$	High
CIE10	Involve community in planning process for design of local facilities	Whittlesea, Hume, Moreland, Darebin, Yarra	MCMC, FOMC	✓	$	High
CIE11	Provide as part of site works, and in accordance with the signage plan, informative interpretation at appropriate locations along the creek and within appropriate open space management areas	Whittlesea*, Hume[P], Moreland*, Darebin*, Yarra[P]	MCMC, DNRE, MW, PV, WTLCCHC	✓	$$	High
CIE12	Investigate appointment of a ranger to improve public safety and provide interpretation (see also previous PS7)	Whittlesea*, Hume, Moreland, Yarra	MCMC	✓	$$	Low
CIE13	Investigate opportunities for further community involvement in planting, including the establishment of community-run vegetable gardens, using non-invasive species, within the creek corridor	Hume[P], Whittlesea*, Moreland	MCMC, FOMC	✓	$	High
CIE14	Investigate potential for an interpretation centre and programs between Craigieburn and Campbellfield when land ownership and management responsibilities are further clarified	Hume, Whittlesea, PV	MCMC, DNRE		$$$	Low
CIE15	Investigate development of an oral history recording program focussing on stories and natural history of the Merri Creek	AAV	WTLCCHC MCMC FOMC	✓	$	High
CIE16	Undertake a survey of creek users to establish usage patterns and determine demand for further facilities	Hume*, Moreland*, Darebin*, Yarra*	MCMC	✓	$$	Low

HEADWATERS TO CRAIGIEBURN ROAD EAST
Recreation, Trails and Access, Public Safety, Community Involvement and Education

Selected Actions Relevant to the Reach
from Sections 4.1 - 4.4

R7 Develop facilities and provide access to the creek open space for residents of Roxburgh Park and Craigieburn through Aitken and Malcolm Creeks and investigate use of Patullos Lane

TA6 Investigate opportunities for bush walking/trekking trails and links and overnight camping areas between Beveridge and Wallan and Craigieburn

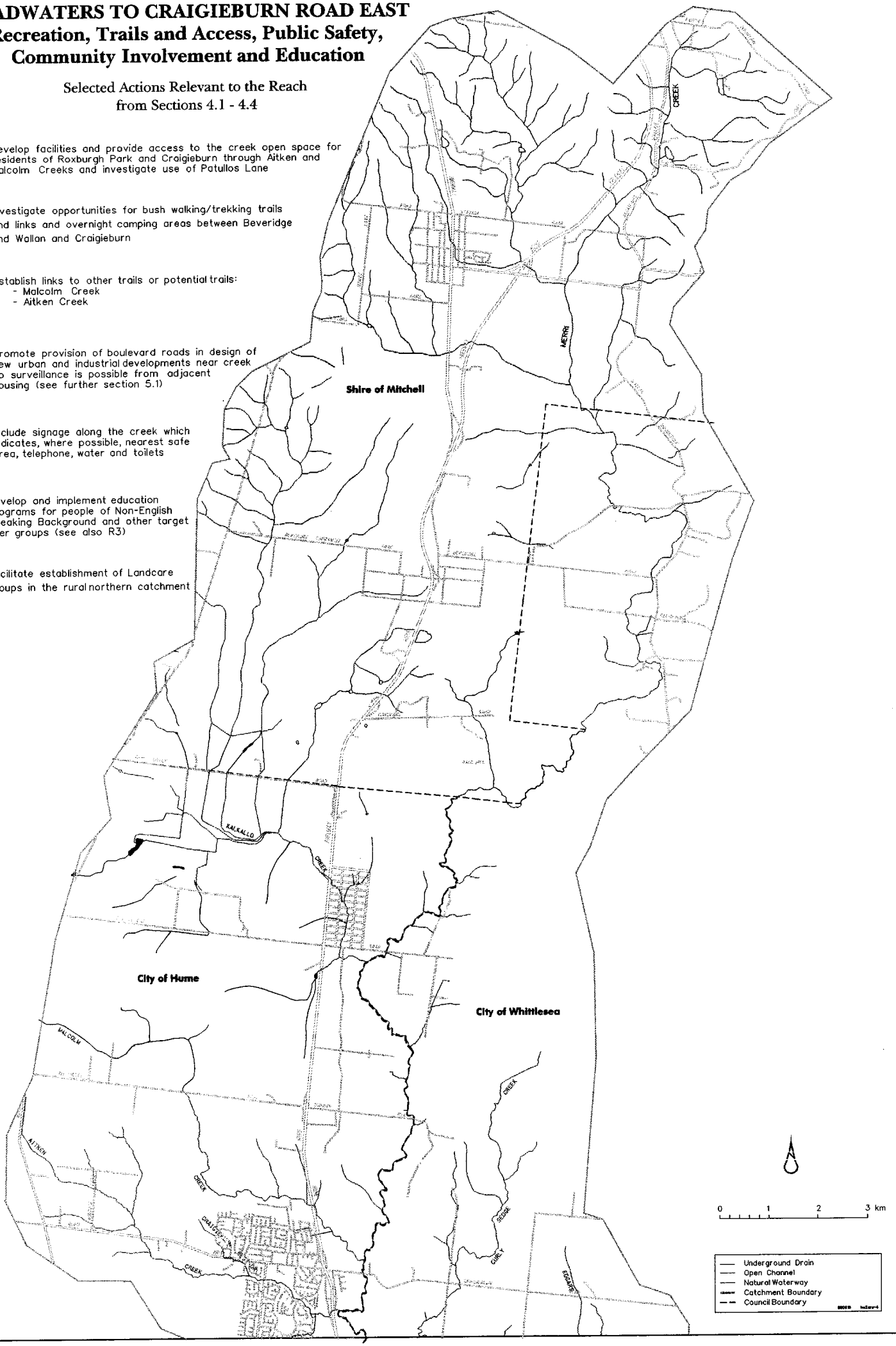
TA10 Establish links to other trails or potential trails:
- Malcolm Creek
- Aitken Creek

PS2 Promote provision of boulevard roads in design of new urban and industrial developments near creek so surveillance is possible from adjacent housing (see further section 5.1)

PS11 Include signage along the creek which indicates, where possible, nearest safe area, telephone, water and toilets

CIE5 Develop and implement education programs for people of Non-English Speaking Background and other target user groups (see also R3)

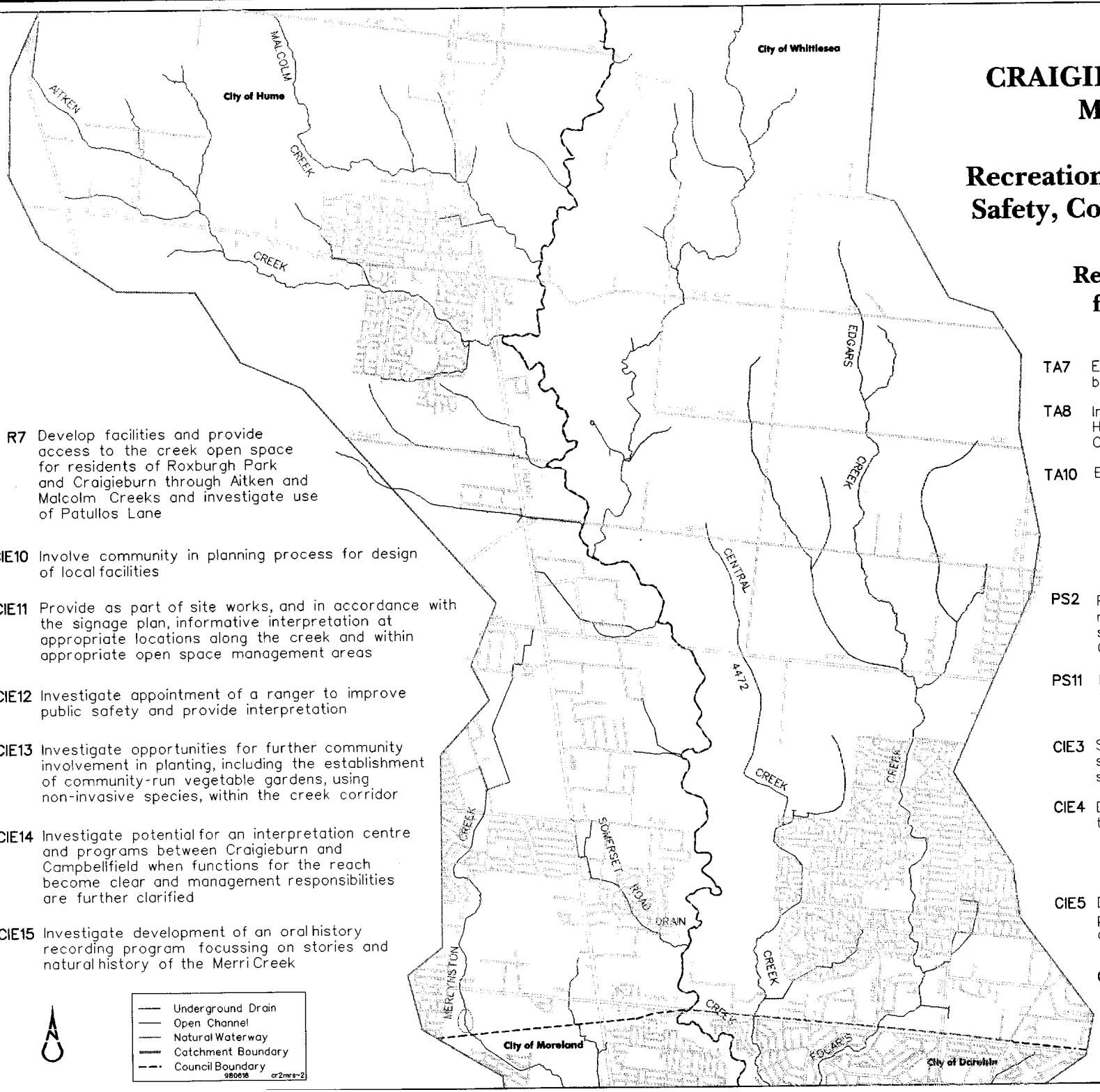
CIE7 Facilitate establishment of Landcare groups in the rural northern catchment



CRAIGIEBURN ROAD EAST TO MAHONEYS ROAD

Recreation, Trails and Access, Public Safety, Community Involvement and Education

Relevant Generic Actions from Sections 4.1 - 4.4



R7 Develop facilities and provide access to the creek open space for residents of Roxburgh Park and Craigieburn through Aitken and Malcolm Creeks and investigate use of Patullos Lane

CIE10 Involve community in planning process for design of local facilities

CIE11 Provide as part of site works, and in accordance with the signage plan, informative interpretation at appropriate locations along the creek and within appropriate open space management areas

CIE12 Investigate appointment of a ranger to improve public safety and provide interpretation

CIE13 Investigate opportunities for further community involvement in planting, including the establishment of community-run vegetable gardens, using non-invasive species, within the creek corridor

CIE14 Investigate potential for an interpretation centre and programs between Craigieburn and Campbellfield when functions for the reach become clear and management responsibilities are further clarified

CIE15 Investigate development of an oral history recording program focussing on stories and natural history of the Merri Creek

Underground Drain
Open Channel
Natural Waterway
Catchment Boundary
Council Boundary
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TA7 Examine opportunities for development of a trail between Craigieburn and Campbellfield

TA8 Investigate the extension of the Merri Path between Hatty Court and Mahoneys Road and within the Campbellfield Retarding Basin

TA10 Establish links to other trails or potential trails:
- Malcolm Creek
- Aiken Creek
- Roxburgh Park
- Metropolitan Ring Road
- Merlynston Creek

PS2 Promote provision of boulevard roads in design of new urban and industrial developments near creek so surveillance is possible from adjacent housing (see further section 5.1)

PS11 Include signage along the creek which indicates, where possible, nearest safe area, telephone, water and toilets

CIE3 Support the establishment of smaller site or purpose specific community groups to achieve local open space development purposes

CIE4 Develop recreation and education programs using the creek environment
- history
- geological sites
- environmental monitoring

CIE5 Develop and implement education programs for people of Non-English Speaking Background and other target user groups (see also R3)

CIE6 Develop and implement school liaison and environmental education programs (eg. Community Waterwatch)

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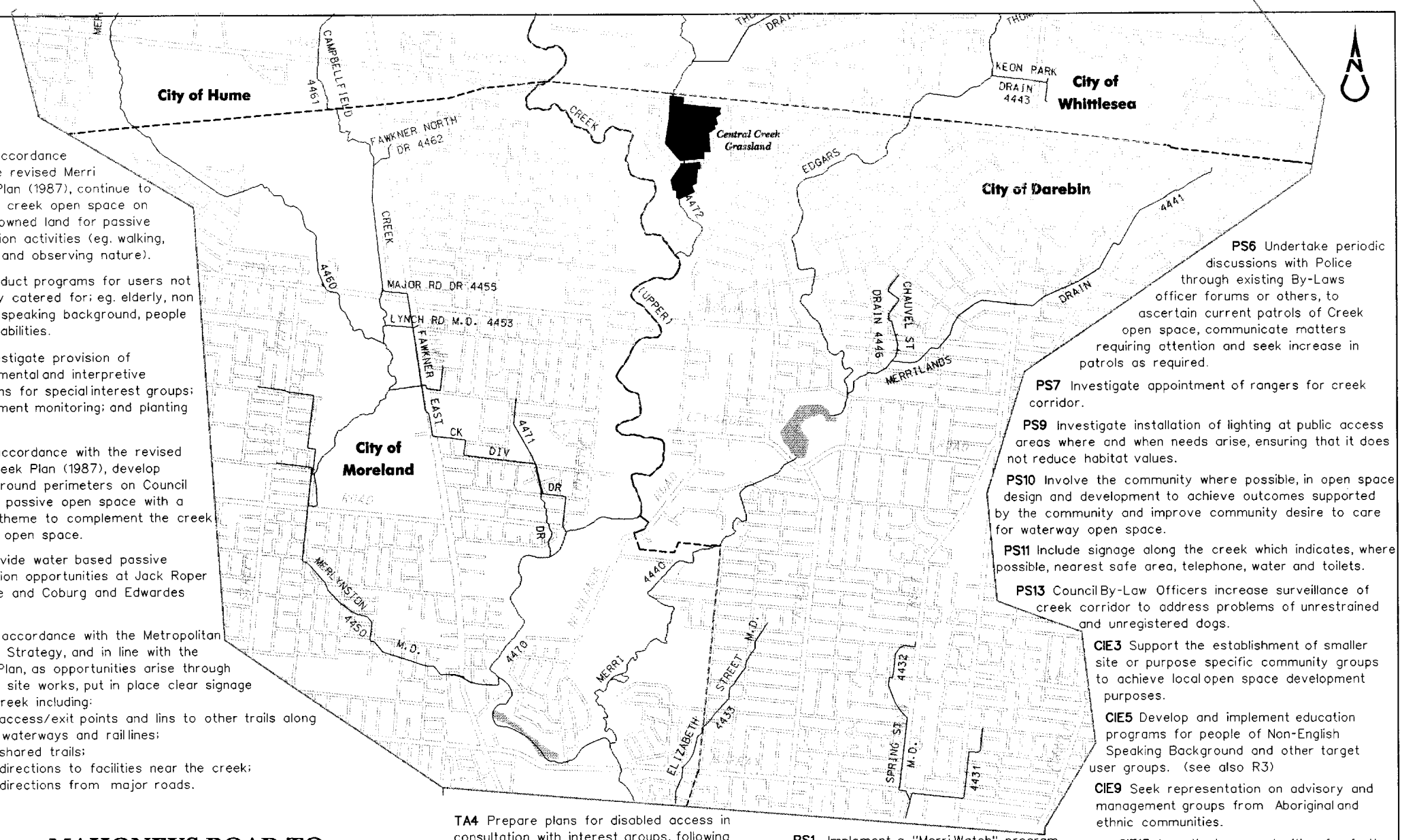


R1 In accordance with the revised Merri Creek Plan (1987), continue to develop creek open space on Council owned land for passive recreation activities (eg. walking, cycling and observing nature).

R3 Conduct programs for users not normally catered for; eg. elderly, non English speaking background, people with disabilities.

R5 Investigate provision of environmental and interpretive programs for special interest groups; environment monitoring; and planting days.

R6 In accordance with the revised Merri Creek Plan (1987), develop sportsground perimeters on Council land as passive open space with a natural theme to complement the creek and its open space.

R9 Provide water based passive recreation opportunities at Jack Roper Reserve and Coburg and Edwardes Lakes.

TA3 In accordance with the Metropolitan Signage Strategy, and in line with the above Plan, as opportunities arise through specific site works, put in place clear signage along Creek including:

- access/exit points and lins to other trails along waterways and rail lines;
- shared trails;
- directions to facilities near the creek;
- directions from major roads.

PS6 Undertake periodic discussions with Police through existing By-Laws officer forums or others, to ascertain current patrols of Creek open space, communicate matters requiring attention and seek increase in patrols as required.

PS7 Investigate appointment of rangers for creek corridor.

PS9 Investigate installation of lighting at public access areas where and when needs arise, ensuring that it does not reduce habitat values.

PS10 Involve the community where possible, in open space design and development to achieve outcomes supported by the community and improve community desire to care for waterway open space.

PS11 Include signage along the creek which indicates, where possible, nearest safe area, telephone, water and toilets.

PS13 Council By-Law Officers increase surveillance of creek corridor to address problems of unrestrained and unregistered dogs.

CIE3 Support the establishment of smaller site or purpose specific community groups to achieve local open space development purposes.

CIE5 Develop and implement education programs for people of Non-English Speaking Background and other target user groups. (see also R3)

CIE9 Seek representation on advisory and management groups from Aboriginal and ethnic communities.

CIE13 Investigate opportunities for further community involvement in planting, including the establishment of community-run vegetable gardens, using non-invasive species, within the creek corridor.

MAHONEYS ROAD TO COBURG LAKE

Recreation, Trails and Access, Public Safety, Community Involvement and Education

Selected Actions Relevant to the Reach from Sections 4.1 - 4.4 -
for complete list of Actions see Section Tables

TA4 Prepare plans for disabled access in consultation with interest groups, following assessment of areas requiring improvement, especially steep grades.

TA5 Implement disabled access proposals as opportunities arise on Council owned land.

TA9 Upgrade Merri Path between Metropolitan Ring Road and Coburg Lake.

TA11 Develop detailed plans for public access along Edgars Creek.

TA12 Develop trail link from Merri Creek along Edgars Creek to Edwardes Lake.

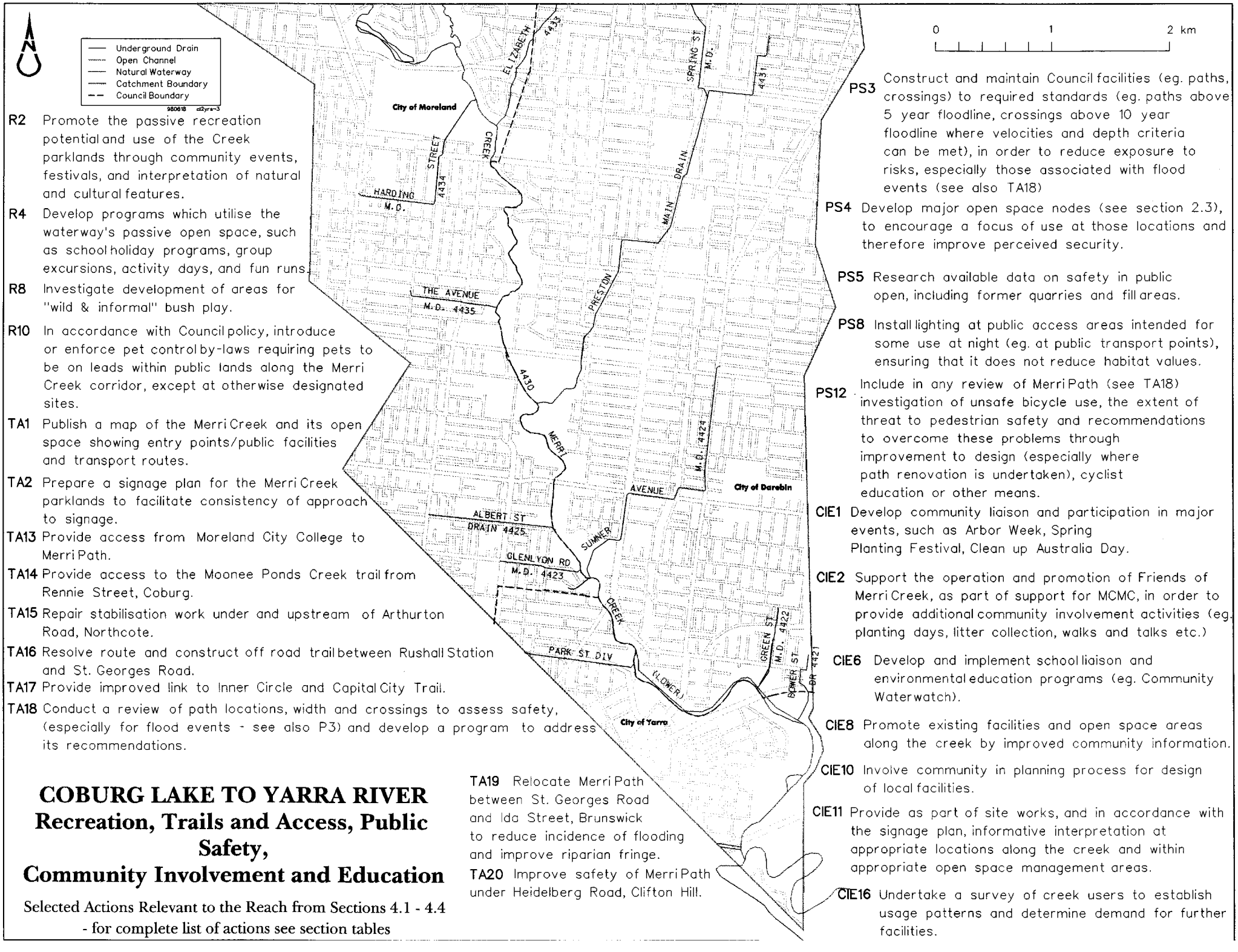
PS1 Implement a "Merri Watch" program for: - rubbish dumping;

- unrestrained dogs (especially those unregistered);
- trail bike surveillance and reporting;
- public safety,

PS2 Promote provision of boulevard roads in design of new urban and industrial developments near creek, so surveillance is possible from adjacent housing. (see further section 5.1).

Underground Drain
Open Channel
Natural Waterway
Catchment Boundary
Council Boundary

0 1 2 km



R2 Promote the passive recreation potential and use of the Creek parklands through community events, festivals, and interpretation of natural and cultural features.

R4 Develop programs which utilise the waterway's passive open space, such as school holiday programs, group excursions, activity days, and fun runs.

R8 Investigate development of areas for "wild & informal" bush play.

R10 In accordance with Council policy, introduce or enforce pet control by-laws requiring pets to be on leads within public lands along the Merri Creek corridor, except at otherwise designated sites.

TA1 Publish a map of the Merri Creek and its open space showing entry points/public facilities and transport routes.

TA2 Prepare a signage plan for the Merri Creek parklands to facilitate consistency of approach to signage.

TA13 Provide access from Moreland City College to Merri Path.

TA14 Provide access to the Moonee Ponds Creek trail from Rennie Street, Coburg.

TA15 Repair stabilisation work under and upstream of Arthurton Road, Northcote.

TA16 Resolve route and construct off road trail between Rushall Station and St. Georges Road.

TA17 Provide improved link to Inner Circle and Capital City Trail.

TA18 Conduct a review of path locations, width and crossings to assess safety, (especially for flood events - see also P3) and develop a program to address its recommendations.

COBURG LAKE TO YARRA RIVER
Recreation, Trails and Access, Public Safety, Community Involvement and Education

Selected Actions Relevant to the Reach from Sections 4.1 - 4.4
- for complete list of actions see section tables

TA19 Relocate Merri Path between St. Georges Road and Ida Street, Brunswick to reduce incidence of flooding and improve riparian fringe.

TA20 Improve safety of Merri Path under Heidelberg Road, Clifton Hill.

PS3 Construct and maintain Council facilities (eg. paths, crossings) to required standards (eg. paths above 5 year floodline, crossings above 10 year floodline where velocities and depth criteria can be met), in order to reduce exposure to risks, especially those associated with flood events (see also TA18)

PS4 Develop major open space nodes (see section 2.3), to encourage a focus of use at those locations and therefore improve perceived security.

PS5 Research available data on safety in public open, including former quarries and fill areas.

PS8 Install lighting at public access areas intended for some use at night (eg. at public transport points), ensuring that it does not reduce habitat values.

PS12 Include in any review of Merri Path (see TA18) investigation of unsafe bicycle use, the extent of threat to pedestrian safety and recommendations to overcome these problems through improvement to design (especially where path renovation is undertaken), cyclist education or other means.

CIE1 Develop community liaison and participation in major events, such as Arbor Week, Spring Planting Festival, Clean up Australia Day.

CIE2 Support the operation and promotion of Friends of Merri Creek, as part of support for MCMC, in order to provide additional community involvement activities (eg. planting days, litter collection, walks and talks etc.)

CIE6 Develop and implement school liaison and environmental education programs (eg. Community Waterwatch).

CIE8 Promote existing facilities and open space areas along the creek by improved community information.

CIE10 Involve community in planning process for design of local facilities.

CIE11 Provide as part of site works, and in accordance with the signage plan, informative interpretation at appropriate locations along the creek and within appropriate open space management areas.

CIE16 Undertake a survey of creek users to establish usage patterns and determine demand for further facilities.

PART D - MANAGEMENT

SECTION 5 - Planning and Management Coordination

5.1 Planning

Background

There are a number of components of planning which will help ensure that the Merri Creek corridor is protected and managed in a manner conducive to its future sustainability. These include waterway and catchment management planning, strategic planning, statutory planning, and open space management planning. The latter three will be considered here.

Strategic Planning

Strategic planning includes metropolitan growth corridor planning. Examples of growth corridor planning include exercises such as those undertaken for the Plenty, Werribee and South Eastern Growth areas.

In the case of the Merri Creek catchment, land within the Hume municipality from Roxburgh Park to north of Craigieburn, has been referred to as the Merri Growth Corridor (see Hume City Council Draft Planning Scheme, 1997, section 21.03.02). The other area of major planned urban growth in the Merri Creek catchment is associated with expansion of the Epping North area in the upper Edgars Creek. These two areas will accommodate future urban growth which has been anticipated for areas beyond the present urban fringe.

While there have been some preliminary studies undertaken in the expectation that the Merri Corridor might be subject to a comprehensive strategic growth corridor study, this has not yet occurred. Management of waste water and provision of potable water have been significant constraints on the planning of large scale urban development across the northern area of Melbourne. These factors may continue to effect planning and development of a Merri Growth Corridor.

Preliminary studies on the environment indicate that the flood management and water quality of Merri Creek as well as the habitat values of the catchment will be adversely affected by urban expansion if it proceeds without adequate forward planning.

Following comprehensive strategic planning, a secondary stage of strategic planning is required to ensure new urban development adequately provides for its drainage and other infrastructure needs. Too often in the past, drainage has been considered as an after-thought in the development of Outline Development Plans.

Instead, these plans need to consider and provide for:

- adequate protection of natural streams and open channels (ie. no piping);
- the creation of wetland systems to treat stormwater (drainage schemes can assist - see Section 3.1);
- the creation of drainage reserves along waterways so the floodplain is protected;
- allocation of open space such that it complements, and even adds to, those areas provided for stormwater treatment and protection of the floodplain.

A key background study for the preparation of the 1994 Concept Plan Final Draft was the two volume report by Context Pty. Ltd. on Land Use Planning and Interim Policies and Guidelines for Development Near the Merri Creek (Context Pty. Ltd., 1993). The thirty-eight recommendations contained in the report involved actions to address a number of strategic planning issues. Amongst them was one to prepare a Local Structure Plan for the area between the Hume Highway and Merri Creek from Craigieburn to Campbellfield. The intention was to provide a framework for development of this major industrial area. It was recommended that such a plan examine the road and open space systems, urban design standards and detailed landscape guidelines.

Industry has had a strong presence traditionally along Merri Creek and at certain points it provides a significant visual intrusion (see section 1.3). While there are already many factories in Craigieburn-Campbellfield vicinity, the development of either a Local Structure Plan or Developer Guidelines is likely to provide benefits for both the development of industry and the waterway and open space corridor.

A Cooper Street Precinct Strategy has recently been prepared for Whittlesea and Hume Councils (Tract Consultants, et. al., 1996), but has not specifically addressed issues associated with the Craigieburn to Campbellfield industrial area and the Merri Creek. It should be noted that the Precinct Strategy provides little certainty for accommodation of biologically significant sites within its study area and perhaps requires some review based on this document. In any case, a more detailed Local Structure Plan or Developer Guidelines for the industrial area within Hume would still be beneficial.

Within the developed urban area occasional strategic planning opportunities arise with redevelopment of sites subject to a change of land use. One such site with implications for Merri Creek is the decommissioned Pentridge Prison in Coburg. This 35 hectare site adjoins the RMIT Coburg Campus and the Moreland City Secondary College. A major strategic planning opportunity exists in considering the future development of this large area of public land and how its northern and eastern frontages might address Merri Creek and Coburg Lake. Redevelopment of the site creates an opportunity for the creation of a major open space node on the creek at this point to service the new land uses.

Statutory Planning

Prior to the commencement of work to prepare the Merri Creek Concept Plan Final Draft (MPW & MCMC, 1994), the Merri Creek Interim Controls were introduced. These consisted of an overlay control mechanism put in place for the creek environs and adjacent private land within the municipalities abutting the creek downstream of Craigieburn Road East. These controls were intended to last until the adoption of the Concept Plan when that document would become a referral document of Council Planning Schemes. However, the Controls lapsed after the Draft Plan remained unendorsed by Government.

The Context report (op. cit., 1993) also sought to have amendments to the Interim Controls introduced so that they might act as permanent overlay controls. Its recommendations also provided a legislative and policy framework for protection of the Merri Creek valley, its natural attributes and open space.

Recently a State-wide exercise has been undertaken to amend State Planning Provisions and local government Planning Schemes. Councils have also prepared Municipal Strategic Statements prior to the preparation of amended and simplified Planning Schemes.

As part of this work, Councils have also supported a process for development of overlay control areas along Merri Creek. This resulted in the preparation of an environmental significance overlay for the creek corridor and lands adjacent to it, especially where those lands are within the viewshed of the corridor or have other values (flora, fauna, archaeological, open space etc.) which provide a relationship to the creek corridor.

The overlay proposed had a number of objectives related to:

- protection of the natural systems of the creek corridor; and
- preservation of recreational uses, landscape character and heritage characteristics and values.

The proposed overlay control also set out decision guidelines for the responsible authority to consider in dealing with an application. It further set out the circumstances where exemptions apply to provisions of the overlay. These mainly apply to works by a public authority or waterway management agency for works associated with the watercourse and its riparian zone or open space.

For various reasons there was not a uniform application of the overlay as a result of the hearings process associated with approval of each of the Planning Schemes for Councils in the catchment. However, the overlay much as proposed, will apply in Hume, Darebin and Moreland.

In addition to any environmental significance overlay, a land subject to inundation overlay will be used to cover areas subject to flooding in the 1% flood event. This will assist in maintaining the waterway and drainage function of the stream.

The preparation of new local government planning schemes has provided the opportunity for review of land use zones. In the case of areas along Merri Creek this has enabled the possibility for rationalisation of zonings, more appropriate names for zones and the clearing up of some old anomalies and outstanding issues (see Context, 1993, p. 43-44).

A further significant element of the Context report (1993), was the Volume 2, "Interim Policies and Guidelines for Development Near the Merri Creek".

This document sought to develop a means by which Council Planning Departments could be provided with additional information which could assist them with determining applications concerning Merri Creek. The Policies and Guidelines were also developed to assist proponents in the preparation of plans for subdivisions, redevelopments, new urban and other development, and public works. The document was not intended to be part of the Concept Plan, but would be part of a suite of documents (including the Concept Plan and Overlay Controls) for use by Councils and others. It would be supplementary to relevant Planning Schemes and in no way replace their provisions.

The document was looked upon as an interim measure which would be subject to further revision and replacement by a more detailed document in the near future. The Merri Creek Management Committee has commissioned further work on the preparation of such guidelines (Integrated Urban Management, in prep.).

Open Space Management Planning

The first attempt to introduce a classification of open space areas along the waterway corridor came with the development of the Merri Creek Plan (MMBW, 1987). This plan included a proposal for three management areas within the urban reaches of the stream - "Active Parkland", "Passive Parkland" and "Bushland Conservation". These areas had a set of aims and policies developed for them and were intended to provide a broad guide to Councils and other land managers about management directions of open space areas. The purpose was to seek to establish "a corridor of community open space along Merri Creek" (MMBW, 1987).

While this classification system for open space was used by some land managers, it was by no means intended to be obligatory. It did however guide the development of some areas of open space and discourage uses which may have been incompatible with provision of a predominantly passive recreation function.

The Context (1993) report recommended a refinement of the 1987 Merri Creek Plan classification categories. The refinement derived from work undertaken for the Northcote Open Space Strategy (City of Northcote, 1992). The report indicated that Public Open Space zones in planning schemes had a variety of uses, intensities and types of development, ranging from major stadia for spectator sports, to natural bushland reserves with no recreation facilities.

The classification of open space types can become a useful guide to land managers about development of open space. It has the potential to achieve a more uniform approach to open space development across municipal areas along the stream. In the past, problems have arisen through inconsistencies of approach to revegetation, though these have tended to diminish since Council amalgamations.

Whittlesea, Moreland and Darebin have recently applied such a classification system to all open space, including along waterway frontages, through their preparation of Open Space Strategies (Moreland City Council, 1996; Whittlesea City Council, 1997; Darebin City Council, 1997 - draft).

Hume City Council is also preparing an Open Space Strategy (see Jeavons and Jeavons, in prep).

Revisions to the Merri Creek Plan (1987) being undertaken by Merri Creek Management Committee, when completed, will include such guidelines based on classification of different open space types.

Issues

- Comprehensive strategic planning is required to effectively plan for future urban development in the Merri Creek catchment so that the waterway and open space corridor can be protected and managed in a sustainable fashion.
- Many problems with inappropriate development near the waterway, and lack of provision for drainage and stormwater treatment, stem from insufficient consideration of drainage issues and waterway impacts at the Outline Development Plan stage.
- Effective planning scheme overlay controls are necessary to ensure planning protection for the lands and values of the waterway corridor.
- Statutory planning conducted without the guidance of a consistent and agreed approach to treatment of the stream corridor can unintentionally result in incremental degradation through a collection of inadequately informed decisions.

Objectives

- Strategic growth corridor planning which takes into account the protection of the stream corridor and its values.
- Outline Development Plans which include consideration of drainage, stormwater treatment, waterway protection and open space provision.
- Strategic planning for redevelopment associated with changed land use which takes advantage of opportunities to have new development better address the stream corridor and which acts as a catalyst for development of open space nodes.
- Incorporation by reference of the adopted Merri Creek and Environs Strategy into the Local section of each planning scheme to which it applies.
- Application of overlay controls to ensure protection of the creek corridor and its values.
- Application of guidelines to assist proponents and planners in dealing with specific site proposals.

Action Program **Note:** * in accountable SA (Statutory Authority) or LGA (Local Government Authority) column = MCMC assigned responsibility for delivery of the action by that Council and P = partnership arrangement for delivery, usually between LGA and MCMC. Overall Notional Cost = combined notional cost of action for accountable parties. N/A = column heading is not applicable. Priority = the agreed priority attached to the action by the steering committee for the Strategy, which may differ from individual agency's timeframes for commencement of implementation of the action due to an agency's budgetary processes.

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
P1	Include reference to the adopted Merri Creek and Environs Strategy within the Local Planning Framework of each municipal Planning Scheme to which it applies.	Whittlesea, Hume, Moreland, Darebin, Yarra	MW, MCMC, DI		$	High
P2	Include waterway, drainage, regional flood management, open space and other waterway corridor issues in strategic growth corridor planning exercises and discussion of them with Councils.	DI	Whittlesea, Hume, MW, MCMC		$	High

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
P3	Apply the appropriate overlay controls covering the stream environment (eg. environmental significance overlay) to ensure development proposal impacts are fully considered at the planning stage.	Whittlesea, Hume, Moreland, Darebin, Yarra	MCMC		$	High
P4	Address zoning anomalies and inconsistencies as outlined in the Context report (op. cit., 1993) - 5.5, p. 43-4.	Moreland, Darebin	MCMC	✓	$	High
P5	Undertake completion of *Development Guidelines for the Merri Creek* or similar document. When completed ensure use of the document through the conduct of a workshop for Council and agency staff to introduce the Guidelines and seek their listing as one of the matters a responsible authority should have regard to in considering permit applications within overlay control areas.	Whittlesea, Hume[P], Moreland, Darebin, Yarra, MW	MCMC		$	High
P6	Make available when completed copies of *Development Guidelines for the Merri Creek* (or similar document) for development proponents and consultants	Whittlesea, Hume, Moreland, Darebin, Yarra	MCMC		$	High
P7	Prepare Developer Guidelines for industrial areas between Hume Highway and Merri Creek from Craigieburn to Campbellfield	Hume	MCMC MW		$$	High
P8	Review/update and monitor Cooper Street Precinct Strategy to take account of the recommendations of this Strategy and outcomes of the review of the route of the Hume Freeway	Hume, Whittlesea	MCMC		$	High
P9	Include investigation of Merri Creek frontage in the development of strategic plans for the Pentridge Prison precinct	Moreland	MCMC		$	Medium
P10	Complete a revision of the Merri Creek Plan (1987) consistent with recommendations of the Context report (op. cit., 1993) and the various open space strategies of Councils	Whittlesea, Hume*, Moreland, Darebin, Yarra	MCMC	✓	$$	High

5.2 Management Coordination

Background

History of Coordination and Evolution of MCMC

Merri Creek has experienced a long history of cooperative management coordination. In 1976 the Merri Creek Coordinating Committee (MCCC) was created to formalise a relationship between local government, State sector agencies and the community to protect and enhance the creek and its environs. Over the thirteen years of its existence, the MCCC had representation from eight Councils along Merri Creek, as well as the MMBW and numerous local community groups. It was an unincorporated association which acted as an advisory committee to Councils and State agencies. The MCCC neither employed staff, nor undertook works by itself. Councils and State agencies remained the vehicle through which waterway and open space improvements were carried out.

This type of cooperation delivered some significant benefits. For example, in the early 1980s funds were obtained through the efforts of the MCCC for a study into the development of a Merri Creek Path. This provided the basis for Council application to Federal labour market programs of the mid 1980s for much of the path's construction and associated revegetation works. The construction of the Merri Path opened up community access to the waterway and provided a focus for continuing improvement of the stream's environs.

The record of achievement which the MCCC had established by the mid-1980s, was in part responsible for the attraction of further funding from external sources (Ernst and Whinney Services, 1988). One such source of funding was the Australian Bicentennial Program. Commencing in 1986, the Program allocated $1m for Merri Creek to be administered through the MMBW. This fund provided contributions to a host of initiatives including path construction, bridge crossings and a small amount of land acquisition assistance. It also provided the means by which a program of revegetation works were conducted through a specialist works crew on lands owned by Councils and the MMBW across four municipalities. This model of a specialist works crew was to later provide impetus for the development of a similar, more permanent entity through a new management committee structure – the Merri Creek Management Committee.

A key step in the evolution of this new structure was the Bicentennial Program's funding of a review of management arrangements for Merri Creek during 1987/8. This review was carried out by independent consultants, Ernst and Whinney Services. Their recommendation was that a new organisation, to be known as the Merri Creek Management Committee (MCMC), be brought into existence with membership from the then eight Councils, MMBW, the then Department of Conservation, Forests and Lands (DCFL) and a new Friends of Merri Creek group representing the community sector.

The report from Ernst and Whinney Services cited five problem areas which formed a basis for recommending a change from the structure provided by the MCCC. The problems were:

- the need for a more formal mechanism (beyond that of the MCCC's information exchange function) able to achieve coordinated regional planning, development and maintenance of the waterway's open space;
- the need to replace a volunteer-dependent organisation with one which was better resourced and more sustainable - the impetus for the MCCC's activities and functioning had come almost entirely from the community sector;
- the need for a greater commitment to maintenance of capital works along the waterway and its open space (especially revegetation works);
- the need for provision of specialist additional skills in both planning and creek maintenance and development activities; and
- the need to provide greater forward planning as well as other planning controls to ensure the protection and development of the waterway's open space.

As a result of the report's recommendations, the MCMC would, on behalf of member groups, employ staff to carry out activities deemed essential by the review. Specialist vegetation management works and open space development works, negotiated with, and part funded by, the member Councils were the primary area of activity of the new MCMC - certainly the vast majority of the organisation's funds were to be initially directed to those ends.

The review emphasised that these works were in no way intended to replace those undertaken by Councils along the creek. Instead, they were to be additional to those undertaken by Councils and provide much needed expertise in vegetation management from which Council work forces might derive benefit through provision of training generated by MCMC (Ernst and Whinney Services, 1988).

In addition, the MCMC, through the creation of the Manager's position, would make a significant contribution to the preparation of the Merri Creek Concept Plan and other planning matters, as well as servicing other needs generated by the work of the committee.

A key element in enticing Councils to support the MCMC concept was the continuation of subsidised funding of waterway and open space works on a similar basis to labour market programs and the Bicentennial fund of the mid to late 1980s. To achieve this the MMBW guaranteed funding of the MCMC for an initial three year period. Other State sector funds were contributed through grants from DCFL under their Urban Nature Conservation Program.

The MCMC was brought into existence as an incorporated association in 1989. It had no statutory powers and acted as an advisory body to its member organisations.

The MCMC has continued as an incorporated association since 1989, with the retention of its core membership, apart from the Department of Natural Resources and Environment which ceased to be a member in 1996. During the mid-1990s, the MCMC was able to access significant amounts of Federal labour market program funding (especially Jobskills), which added considerable value to Council contributions. The Jobskills program has now ceased.

A draft report reviewing the MCMC's operation was prepared by the MCMC in 1995 following consultation with member organisations.

Northern Waterways Review

The Northern Waterways Review (Kunert and Wright, 1997) sought to investigate the coordinating of planning and management of waterway related matters across four northern waterways - Moonee Ponds, Merri, Darebin and Plenty (Minutes of Northern Waterways Review Meeting No. 1, April, 1996). Some further assessment of the MCMC was conducted for this review.

The review was unable to achieve the development of a common position between Melbourne Water and Councils over the scope of waterway management coordination structures. In simple terms, Melbourne Water supported an exclusive regional approach across the four waterways of the study area, while Councils tended to support more locally based organisations, while also expressing some interest in potential benefits of regionalism.

The three key priorities for change recommended by the Northern Waterways Review were:

- the establishment of a Moonee Ponds Creek Coordinator;
- the seeking of agreement on the role and funding of a regional coordination body by the Northern Waterway Coordination Review Reference Group; and
- establishment of a regional coordination body.

In addition, the review made five other recommendations about local coordination bodies. Included amongst them were recommendations to ensure representation of local coordination bodies on the proposed regional body and the establishment of clear procedures for local government representatives sitting on waterway coordination committees where the committee is a tenderer for works offered by local government.

Legislative Context - Catchment and Land Protection (CALP) Board

Since the introduction of the Catchment and Land Protection (CALP) Act in 1994, Boards have been set up for each of Victoria's ten catchment areas. Merri Creek is within the Port Phillip and Western Port catchment.

The CALP Act establishes a new framework for the integrated management of land and water resources, including control of pest plants and animals. It also establishes a process for setting priorities for the management of land and water resources throughout the State.

The CALP Boards have responsibilities for:

- preparation of regional strategies for management of natural resources;
- encouraging cooperation of those involved in natural resource management;
- advising the Minister on priorities and the operation of the CALP Act;
- promoting community awareness; and
- recommending measures on Crown land to prevent land degradation.

A Strategy for the Port Phillip and Western Port catchment has recently been released by the CALP Board. It sets out a number of actions in the areas of:

- advice and coordination;
- monitoring and reporting;
- priorities and funding arrangements;
- water quality protection;
- pest plant and animal control;
- native vegetation and habitat protection;
- waterway management and flood protection;
- strategic and statutory land use planning; and
- integrated land management.

In parallel with the preparation of the Regional Strategy, an Action Plan for the Yarra catchment has also been prepared. It identifies priority areas for implementation of on-ground activities to achieve the vision and goals of the Regional Catchment Strategy.

In addition, a review of catchment management arrangements for the Port Phillip and Western Port catchments has been underway for some time. This review follows similar exercises for the other CALP catchments throughout the state during 1996/7.

Outcomes of the review could potentially set the framework for establishment of a Catchment Management Authority and for the creation of new coordination groups for each of the five current sub-catchment areas of the Port Phillip catchment (Werribee, Maribymong, Yarra, Dandenong Valley and Western Port). Further implications for local waterway coordination bodies such as MCMC, cannot be anticipated at this stage.

Management Coordination Fundamentals

Management coordination is based upon some essential premises. Amongst these, the following are particularly applicable in the case of Merri Creek.

- Management agencies have differing roles and responsibilities in the management of the waterway, and its lands and open space along the creek corridor.

- Coordination ensures avoidance of duplication of effort, can ensure scarce resources are used to best effect and can bring about consistency of approach to works across municipal boundaries and across agencies.

- The communication and cooperation engendered through coordination produces benefits for participants, on some occasions translating into cost reductions. For example, new approaches to works, especially technological developments and new methods of delivery can come about as a result of communication between parties and the challenging of conventional ideas and approaches.

- Synergistic benefits become available through cooperation, especially on occasions when access to external funding is available. The accessing of additional external funding merely through being a recognised cooperative entity has been demonstrated to be a positive element of the existence of coordinating bodies for Merri Creek.

- Inclusion of views from all sectors (local and State government agencies and the community) potentially means the generation of well considered advice back to member organisations.

- A sounding board and source of comment on proposals is readily available for use by member organisations.

Current Roles and Responsibilities of Local Government and Key State Agencies (for further information see Introduction, p. 10-12)

(i) Melbourne Water

Melbourne Water is required to deliver:

- waterway, drainage, floodplain and riparian zone management, including protection and enhancement of flora, fauna and habitat values within the floodplain; and
- flood protection and flood warning services.

Melbourne Water also facilitates:

- water quality protection and improvement works;
- the monitoring and reporting of the performance of stormwater managers and the state of water environments;
- identification of best practice and the setting of standards and targets for stormwater management;
- the funding of research to identify best practice for stormwater management and the development of new technology;
- waterway recreation setting provision so others can develop waterway recreation facilities.

(ii) Local Government

Councils now have the principal responsibility for recreation, open space and amenity provision and development along many waterway corridors, including Merri Creek, especially on lands which they own. In carrying out this role Councils can receive some funding support from grant schemes such as that administered by Parks Victoria.

Within the more established urban areas of the lower catchment there are a number of areas subject to an historic comparative lack of open space. In this context, the Merri Creek corridor assumes an important function in municipal open space provision.

In addition, the open space associated with waterways are an important recreation asset for local communities. The open space adjacent to Merri Creek supports a number of sporting fields and facilities, especially upstream of Bell Street. In addition, throughout its urban length especially, the creek provides a significant passive recreation resource. It is Councils' role to generally undertake construction and maintenance of recreation related facilities along the waterway, be they sports fields and buildings, paths and associated crossings, and playgrounds.

Councils also have a key role to play in the management of local drainage through construction and maintenance of drains which feed into the Melbourne Water regional Main Drain system. Councils can thus assist with protection of water quality prior to its discharge to Main Drains and waterways.

A further critical role which Councils perform is associated with their administration of planning schemes. There is scope within this role to influence planning requirements to assist in flow quantity management and protection of water quality (see further section 3.1).

(iii) Department of Natural Resources and Environment

DNRE has a diverse range of roles in relation to Merri Creek. It plays a role in management of environmental flows, oversees bulk water entitlements and is a support agency in the area of aquatic and freshwater ecology and instream habitats. It is the key fisheries manager and this function sits with its flora and fauna management and monitoring functions.

DNRE is closely affiliated with the implementation of the CALP legislation throughout the State and assists the work of the CALP Council and regional Boards.

A further role of DNRE is to provide advice to land managers generally (including Parks Victoria), about the management of sites with flora and fauna significance. DNRE is also involved in providing for the protection of sites and in some cases this may involve acquisition. DNRE has thus been involved in discussions to provide for the protection of the nationally significant Craigieburn grasslands.

Once sites such as the Craigieburn grasslands have been secured, DNRE has a further role in recommending the nature and scope of their management to "provider" organisations such as Parks Victoria.

(iv) Parks Victoria

Parks Victoria has responsibilities for delivery of management works on regionally significant park and reserve sites. Along Merri Creek, Parks Victoria currently manages the 23 hectare Cooper Street grassland reserve. It also owns the land where the Jukes Road grassland is located, as well as some of the land adjacent to Central Creek where an area of remnant grassland is located.

SECTION 6 - Implementation and Monitoring

6.1 Implementation

Background

Too often a Strategy of this type is treated as end in itself. In the rush to identify and articulate a host of issues, often too little emphasis is given to implementation of the Strategy's actions. Without a clear understanding of the ramifications of accountability for actions - as well as a commitment to their periodic review to continue to give them life - even the best of strategy plans can soon become worthless.

A Strategy of this type should be seen as a tool by which responsible parties can better address issues and actions for which they are accountable. It should be treated as a mere starting point and a vehicle by which agencies have a planning framework and philosophy to tackle the implementation of recommended actions which they have deemed to be acceptable and achievable for their organisation.

In the case of this Strategy all actions have been scrutinised by the various accountable agencies and accepted as achievable within current budgetary circumstances. In addition, at the time of preparation of the document, all accountable agencies have indicated their preparedness to fund the Strategy's actions. However, funding of actions will be subject to annual budgeting processes. This may mean that Councils and other funding stakeholders are unable to fund actions according to the priority given specific actions by the Strategy Steering Committee.

As for the detail of implementation, it will occur through each agency developing works plans and budgets to prioritise and program works to meet the action requirements. In the case of Councils, these works plans could involve the allocation of a spread of funding directed to:

- various parts of Council and their Parks business units or contractors; and
- the MCMC - to deliver actions where the Council has assigned MCMC responsibility for delivery.

It has not been seen as the role of this Strategy to outline as a set of further appendices these works plans for each Council or agency. This is clearly a matter which only each agency can undertake. The inclusion of such detail could unrealistically raise expectations about achievement of actions and tie Councils to implementation over timeframes beyond the term of current elected Councils and their budgetary commitments.

It will therefore be a matter for each agency to more accurately cost actions and allocate funding for implementation over manageable budgetary periods.

It is anticipated that a degree of accountability for implementation will be obtained through presentation of a biennial report on implementation achievements. This could become part of a biennial review of the Strategy convened between the stakeholders (see further below). In addition, an opportunity for presentation of regular reports to MCMC meetings on achievement of actions will also be made available and will serve as a further means by which the Strategy's actions can be kept before stakeholders.

Beyond that, implementation of actions will very much up to the will of each agency and the continuing availability of financial and human resources within their organisations.

Action Program **Note:** * in accountable SA (Statutory Authority) or LGA (Local Government Authority) column = MCMC assigned responsibility for delivery of the action by that Council and **P** = partnership arrangement for delivery, usually between LGA and MCMC. Overall Notional Cost = combined notional cost of action for accountable parties. N/A = column heading is not applicable. Priority = the agreed priority attached to the action by the steering committee for the Strategy, which may differ from individual agency's timeframes for commencement of implementation of the action due to an agency's budgetary processes.

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
IMP1	Develop three year priority activity plans to assist implementation of Strategy actions by major stakeholders and develop budget bids accordingly	Whittlesea, Hume, Moreland, Darebin, Yarra, MW	MCMC		$	High
IMP2	Prepare regular reports to MCMC meetings regarding achievement of implementation	Whittlesea, Hume, Moreland, Darebin, Yarra, MW	MCMC	✓	$	High

6.2 Monitoring and Review Procedures

Background

This Strategy will not achieve its full potential unless adequate monitoring and review are undertaken. As indicated above, such processes are a tool for accountability as well as providing an essential opportunity to amend and adapt actions as issues are resolved, actions implemented, and organisation's roles and responsibilities change. In this way a document such as this can maintain its relevance with the detail of actions progressively shaped to meet broad goals set down at the time of the document's preparation.

In order to meet this essential monitoring function, it will be necessary to conduct a biennial review of the Strategy. Such review meetings of stakeholders should be conducted in the first quarter of the calendar year with an initial meeting scheduled for November 2000. In this way coordination between funding parties can be conducted in the lead up to agency budget preparation.

Action Program **Note:** * in accountable SA (Statutory Authority) or LGA (Local Government Authority) column = MCMC assigned responsibility for delivery of the action by that Council and P = partnership arrangement for delivery, usually between LGA and MCMC. Overall Notional Cost = combined notional cost of action for accountable parties. N/A = column heading is not applicable. Priority = the agreed priority attached to the action by the steering committee for the Strategy, which may differ from individual agency's timeframes for commencement of implementation of the action due to an agency's budgetary processes.

CODE	ACTION	Accountable SA or LGA	Support Role	MCMC Coord'n Req'd	Overall Notional Cost	Priority
M&R1	Undertake biennial monitoring and review meetings of stakeholders to: • receive reports on progress with implementation of actions; • review and amend the contents and actions of the Strategy to continue to make it relevant to the needs of stakeholders; and • make any new recommendations for action as agreed between stakeholders and the accountable organisation.	Whittlesea, Hume, Moreland, Darebin, Yarra, MW, DNRE	MCMC	✓	$	High

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