Murray River Riparian Planning Controls Study

Prepared for
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Contents

List of figures

List of tables

Abbreviations

Abbreviation	Description
ARI	Average Recurrence Interval
Codes SEPP	*State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*
DA	Development Application
DCP	Development Control Plan
DP&E	NSW Department of Planning and Environment
DPI Water	Department of Primary Industries – Water (formerly NSW Office of Water)
EP&A Act	NSW Environmental Planning and Assessment Act 1979
EWAG	Environmental Water Allocation Groups
FAP	Frontage Action Plan
FRMP	Floodplain Risk Management Plan
ISEPP	*State Environmental Planning Policy (Infrastructure) 2007*
LEP	Local Environment Plan
LG Act	NSW *Local Government Act 1993*
LGA	Local Government Area
MDBA	Murray Darling Basin Authority
MREP2	Murray Regional Planning Policy No. 2 - Riverine Land
OEH	NSW Office of Environment and Heritage
RMS	NSW Roads and Maritime Services
SEPP	State Environment Planning Policy
WM Act	*NSW Water Management Act 2000*

Executive summary

The NSW Department of Planning and Environment (DP&E) is currently preparing a draft Regional Plan to guide and inform sustainable growth of the Riverina-Murray Region over the next 20 years. To support development of the draft Regional Plan, the DP&E has commissioned this study to review the existing planning controls applicable to development along the Murray River (including development within the main river channel) and make recommendations for future river-related planning controls.

The study reviewed legislation, plans, policies, (including the draft Murray River Regional Strategy 2009), and literature including documents provided by DP&E and other NSW agencies. The study also consulted federal, state and local government agencies.

The findings, analysis and recommendations of the report are contained in four main chapters:

- *Chapter 2: Legislation plans and policy* – summarises the range of NSW planning instruments relevant to development along the Murray River, including a comparative analysis of riverine planning controls in Victoria and South Australia.
- *Chapter 3: Issues* – analyses the main issues identified during the study.
- *Chapter 4: Options* – presents opportunities to address the issues identified using a variety of mechanisms including planning reforms, development assessment criteria, management plans, strategies and stakeholder engagement.
- *Chapter 5: Recommendations* – identifies the key actions required to address the issues raised and analysed in the report.

The primary legislation governing planning for the Murray River in NSW is the *Environmental Planning and Assessment Act 1979* (EP&A Act). There are numerous instruments under this Act that have direct bearing on how development along the river proceeds including:

- *Murray Regional Environmental Plan No 2 – Riverine Land* (MREP2), gazetted in 1994 and currently under review - applies to development in 11 Local Government Areas (LGAs) along the Murray River.
- Standard Instrument Local Environment Plans (SI LEP) - adopted by most Councils, including 'default' setback distances for development in both urban (40 metres) and rural (100 metres) areas.

Other legislation such as the *Water Management Act 2000 (WM Act)* controlled activity provisions also play an important role in riparian management.

Generally, development pressures along the Murray River are low, with areas of intense development pressure in, and adjacent to, some towns. The overall objectives of the current planning scheme to protect the Murray River, whilst allowing for its use and enjoyment, are still considered appropriate and are widely supported by stakeholders.

Planning provisions for facilitating appropriate development in urban areas are generally effective. There is however a consistent call for improvements to enable better management of the following issues:

- Streamlining in the planning process, e.g. requirements of MREP2 and limited opportunity to use exempt and complying development provisions.
- Consistency in requirements for setbacks and the definition of the 'high bank'.
- Development on flood prone land and linear/ribbon developments.
- Increasing tourism and recreational pressures.

- Impact of environmental watering and climate change.
- Funding and capacity constraints in government agencies.

Options for improvements range from minor amendments to existing provisions, such as an update to SI LEP model clauses to address infill development, to strategic inter-agency collaborations, e.g. the development of waterfront management strategies. The report focuses on the options that leverage off existing policies or programs, whether these are at a whole-of-government level, e.g. reducing red tape, or at an issue-specific scale, e.g. managing flood risk as per the Floodplain Development Manual. The options discussed broadly relate to 'community engagement and information' and 'funding and resources'.

Finally the report recommends the following actions to facilitate an improvement to the planning controls on development along the NSW Murray River:

1. Finalise Floodplain Risk Management Plans (FRMP) for all LGAs
2. Develop Floodplain Risk Management Plans (FRMP) for LGAs which have not commenced
3. Update Flood Planning Area maps in LEPs
4. Update and implement new Flood Planning Levels
5. Prohibit urban land releases in high hazard flood prone areas
6. Retain minimum river setback distances in LEPs
7. Amend the model river setbacks clause to allow infill development
8. Amend the model clause 4.6(8) (Exceptions to development standards)
9. Prepare a range of practice notes detailing the various elements of river management
10. Develop a tourism and recreation strategy
11. Identify and develop dedicated river use zones
12. Support the actions in the Regional Boating Plan Murray-Riverina Region
13. Streamline approval process for moorings
14. Streamline complying 'bed and bank' and riverfront DAs
15. Update the DPI Water guidelines for complying structures on watercourses
16. Develop a multi-agency Waterfront Management Strategy
17. Utilise existing programs and partnerships to leverage improved management outcomes
18. Build community awareness and understanding of river-related issues
19. Support research into key issues
20. Interpret and implement climate risk adaptation measures

1 Introduction

1.1 Project need

The NSW Department of Planning and Environment (DP&E) is preparing a draft Regional Plan to inform sustainable growth of the Riverina-Murray Region over the next 20 years. To support development of the draft Regional Plan, the DP&E has commissioned this study to review existing planning controls for development on and adjoining the Murray River and make recommendations for future river-related planning controls.

It is noted that this study does not cover all of the 26 councils included in the draft Riverina-Murray Regional Plan. It is further noted that the scope of this study extends to include Wentworth and Balranald local government areas, which are not included in the draft Riverina-Murray Regional Plan.

1.2 The Murray River

The Murray River is Australia's most iconic river and has significant environmental, social, heritage and economic values. The river rises near Mount Kosciuszko in the Australian Alps and flows 2,530 km to the mouth near Goolwa in South Australia.

The major population centres along both the NSW and Victorian side of the river include, Albury/ Wodonga - 82,083; Moama/ Echuca - 16,000; Swan Hill/ Murray Downs - 9,700; Mildura - 32,000, and Renmark - 8,000.

The focus area for this study covers all LGAs along the Murray River between Tumbarumba Shire and the South Australian border (Wentworth). This area includes the towns of Barham, Deniliquin, Moama, Corowa and Albury and Victorian cross border towns of Yarrawonga, Cobram, Echuca, Swan Hill and Mildura.

This section of the Murray River is highly modified and regulated by the major impoundments of the Hume Dam (located above Albury), Dartmouth Dam (on Mitta Mitta River, Victoria) and Lake Mulwala. These storages are managed to deliver irrigation, flood control, environmental and urban requirements for downstream communities.

The Murray River supports a diverse range of natural environments including wetlands, rivers, floodplains, river red gum forests, black box and grey box woodlands. These are refuges and breeding sites for many threatened species. Several significant sites are found along the Murray River and are recognised under international treaty (Ramsar) including Kerang Wetlands, Gunbower and Barmah Forests in Victoria and the NSW Central Murray Forests (including the Murray Valley National and Regional Parks, the Werai Forests, and the Koondrook–Perricoota State Forests).

The Central Murray also supports significant agricultural, tourism, conservation and forestry industries. Agricultural produce for domestic and international consumption includes dairy, grains such as rice, dryland grazing, vegetables, nuts, olives, citrus and stone fruit and grapes. Development for agriculture and other land uses has resulted in significant modification to floodplains and added to the demand for irrigation, industrial, stock and domestic water from the river. Together the mix of land uses in the Central Murray contributes to the pressures impacting on the river and connected environments. Therefore existing and future development needs to be managed in a sustainable way if the area is to continue to provide the services for which it is valued.

1.3 Objectives and scope

The principle objective of the Murray River Planning Controls study is to independently review existing planning controls applicable to the Murray River and recommend an approach to ongoing river management.

The recommendations are expected to inform the drafting of the draft Riverina-Murray Regional Plan. To achieve this objective the study:

- Reviewed the legislative framework and existing planning controls for the Murray River in NSW from Tumbarumba Shire in the east to Wentworth Shire in the west.
- Focussed on planning controls under the *Environmental Planning and Assessment Act 1979* and how they are implemented in relation to the river system, predominantly for urban areas.
- Considered how other states approach management of riverfront land along the Murray River.
- Identified issues associated with development along the Murray River.
- Presented and analysed options for addressing identified issues.
- Recommended planning controls for future development along the Murray River.

Whilst the analysis and recommendations are directly applicable to the Murray River they are also relevant to other Murray-Darling Basin rivers in NSW.

It is important to note that the issues of priority focus and consideration in this study were identified through detailed multi-stakeholder consultation. As a result these may not exactly reflect the priorities of any one stakeholder and may not take into account developments in policy or legislation which may have occurred but have not yet impacted on the operation or activities of the stakeholders consulted.

1.4 Study methods

This study was undertaken by:

- reviewing existing legislation, plans and policies;
- reviewing the Draft Murray River Regional Strategy (2009) and associated consultation submissions;
- identifying and reviewing literature, including documents provided by DP&E and other NSW agencies; and
- conducting face-to-face and phone consultation with staff from the Murray Darling Basin Authority (MDBA), nine NSW agencies and 11 Councils (all those within the area covered by MREP2, refer to **Figure 1**.

Figure 1: Murray River in NSW

2 Legislation, plans and policy

Legislation, plans and policies applicable to the management of riparian and riverine areas in NSW are listed and summarised below to provide background to the analysis. The report is based on the existing framework set out by the *Environmental Planning and Assessment Act 1979* (EP&A Act).

2.1 *Environmental Planning and Assessment Act 1979*

The EP&A Act and its accompanying regulations are the primary legislation for land use planning in NSW. The EP&A Act encourages, among other things:

- The proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment;
- The protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats; and
- Ecological sustainable development.

It also aims to promote sharing responsibility for environmental planning between the different levels of government.

2.1.1 SEPPs and REPs

State Environmental Planning Policies (SEPPs) are planning instruments under the EP&A Act that regulate land use and development. The *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) is relevant to this study as it provides a simplified assessment process for infrastructure. Under the ISEPP, waterway or foreshore management activities are defined as:

- riparian area and bank management, including erosion control, bank stabilisation, re-snagging, weed management, revegetation and the creation of foreshore access ways
- in-stream management or dredging to rehabilitate aquatic habitat or to maintain or restore environmental flows or tidal flows for ecological purposes.

As of 1 July 2009, Regional Environmental Plans (REPs) are generally no longer considered part of the hierarchy of environmental planning instruments in NSW, and most REPs are now considered deemed SEPPs. The *Murray Regional Environmental Plan No 2 – Riverine Land* (MREP2) was gazetted in 1994 with the aim of ensuring the river and its floodplain are able to support a range of productive land uses while protecting the riparian environment.

The MREP2 was created to manage development on land adjoining the Murray River, and carried out in the river channel. The River, as the border between NSW and Victoria falls under the jurisdiction of NSW, hence development on the 'Victorian side' of the river needs to be managed by a separate Victorian planning instrument (any development in the river channel or development which has impact on the river, requires consent from NSW authorities). The MREP2 is being reviewed by the DP&E as some of the provisions concerning consultation with external parties for minor development are now outdated.

The specific desired outcomes of the MREP2 are to:

- prevent further land degradation
- restore degraded resources
- ensure that resources are used within their capacity

- minimise impacts arising from the use of resources
- ensure that native flora and fauna is maintained
- ensure development is set well back from the River
- preserve items or places of cultural heritage values.

The review of the MREP2 has been partially delivered through the development of the Draft Murray Regional Strategy in 2009. Actions contained in the draft Riverina-Murray Regional Plan are expected to further inform and progress the review of the MREP2.

2.1.2 Standard Instrument Local Environmental Plans

Local Environmental Plans (LEPs) allow councils and other consent authorities to manage land use through zoning and development controls. LEPs are the primary planning tool to shape the future of communities and also oversee local development. LEPs are developed once local strategic direction is set through a comprehensive planning process guided by government policy and strategies. The Draft Murray Regional Strategy 2009 and draft Riverina-Murray Regional Plan set the strategic direction for LEPs in the Riverina-Murray region.

The Standard Instrument LEP (SI LEP) Program was initiated in 2006 to provide for standard formatting, clauses, provisions, mapping and definitions in new planning instruments. This was designed to simplify plan-making and reduce the variations between LEP structure and content across Councils. Ultimately the Program aimed to have a single standard LEP for each LGA, using a suite of 35 land use zones, a range of model provisions and clauses and using approximately 250 standard land use definitions.

All councils along the Murray River now operate under the 2006 SI LEP Order. The LEP drafting was preceded by the preparation of LGA-wide strategies in which Councils planned for future development, guided by policy such as the Draft Murray Regional Strategy 2009. All Councils have zoned the Murray River (and its tributaries) as a 'W' zone (waterways zoning) under the Standard Instrument providing a clear delineation from the adjoining land use zones.

Some SI LEPs include a *Development on River Front Areas* clause. This was developed on advice from the Office of Environment and Heritage (OEH) to reflect the relevant requirements of the MREP2 in numeric terms and to incorporate the existing riverfront setbacks in all Murray River council LEPs.

The model clause also created alignment with the principle of the 'high bank' as defined by the *Water Management Act 2000 (WM Act)*. The model clause includes objectives for the protection of key riverine processes, ecology, public use, amenity and cultural heritage. It restricts development within the riverfront area to a small range of land uses that are deemed 'functionally dependent on the river' including:

- boating and associated facilities
- extensions or alterations of existing buildings
- environmental protection works
- extensive agriculture and intensive plant agriculture
- environmental facilities, recreation areas and facilities
- water recreation structures.

The model clause sets out a number of criteria that must be fulfilled to the satisfaction of the consent authority before development approval is granted. The default river setbacks are incorporated in the clause in the following way:

'River front area means the land between the river front building line and the bank of the nearest river, or if there is no river front building line:

a) In Zone R5 Large Lot Residential or an urban release area – the land within 40m of the high bank of the river; or

b) In Zone RU1 Primary Production, Zone RU2 Rural Landscape, Zone RU3 Forestry, Zone RU4 Rural Small Holdings, Zone RU6 Transition, Zone SP3 Tourist, Zone E2 Environmental Conservation, or Zone E3 Environmental Management – the land within 100m of the high bank of the river.'

In developing the Draft Murray Regional Strategy 2009, most Councils were found to have implemented 40m urban and 100m rural setback in their former LEPs. This consensus position was then incorporated into the Model Clause.

There is provision for Councils to map river setbacks that differ from the Model Clause, with justification provided to the DP&E contained in a planning proposal format (consultation with the OEH is required as part of this proposal) (**see Section 3.2.5**). In the case of urban infill, the DP&E encourages Councils to adopt the Model Clause setbacks, however in some instances where a new development is adjoined by an existing development which has a setback less than the distance prescribed by the subject model clause, the new development can adopt this setback, subject to merit assessment.

2.1.3 Overlays (Natural Resource Maps)

There are eight different environment related zones for councils to use under the SI LEP in zoning environmentally sensitive land. In addition, councils can establish 'overlays' to these zones. Overlays are issue-specific maps showing natural resources or other constraints such as slope and bushfire or flood hazards which may be applicable to an area. Overlays do not change the primary use of the land to which they apply, they simply identify issues for consideration during the assessment of development applications (DAs).

The consideration of overlays is provided for by SI LEP in Part 7 'Additional Local Provisions'. If a DA is lodged on a site where an overlay applies, council must consider the environmental or heritage assets or hazard constraints set out in the clause, and ensure that potential impacts have been avoided, minimised and mitigated to the fullest extent practicable.

There are a number of overlay themes relating to land, water and biodiversity Most Murray River councils have developed and adopted the following overlays and included them in their LEPs:

- terrestrial biodiversity
- flood planning
- inland waters (rivers, riparian, wetlands)
- drinking water catchments/water protection
- groundwater vulnerability.

(N.B. not all overlays are relevant to all councils)

Overlays are an effective tool to trigger councils to make additional considerations without determining outcomes or being prescriptive in terms of solutions. It is acknowledged that the current overlay mapping data may contain inaccuracies, however these issues can be readily corrected with field verification and modelling in the case of flooding.

2.1.4 Section 117 directions

Under section 117(2) of the EP&A Act, the Minister for Planning issues Directions that planning authorities such as councils must follow when preparing planning proposals for new LEPs. The Directions cover issues in a number of categories. The section117 Direction with the most applicability to this study is Direction 4.3 Flood Prone Land. The objectives of this Direction are to:

a) ensure that development of flood prone land is consistent with the NSW Government's Flood Prone Land Policy and the principles of the Floodplain Development Manual (DIPNR 2005), and
b) ensure that the provisions of an LEP on flood prone land is commensurate with flood hazard and includes consideration of the potential flood impacts both on and off the subject land.

Direction 4.3 Flood Prone Land is applicable when a planning authority prepares a proposal that creates, removes or alters a zone or a provision that affects flood prone land. There are a number of actions a planning authority must take when this direction applies, including not rezoning land within the flood planning areas from Special Use, Special Purpose, Recreation, Rural or Environmental Protection Zones to a Residential, Business, Industrial, Special Use or Special Purpose Zone. Planning proposals must also include provisions that give effect to and are consistent with the NSW Flood Prone Land Policy and the principles of the Floodplain Development Manual.

Planning proposals may only be inconsistent with this direction if the relevant planning authority can satisfy the DP&E that:

a) the planning proposal is in accordance with a floodplain risk management plan prepared in accordance with the principles and guidelines of the Floodplain Development Manual, or
b) the provisions of the planning proposal that are inconsistent are of minor significance.

2.1.5 Gateway process

Changes to land zoning or other development controls are most often enacted by amending a council's LEP. This process is known as the 'gateway process' and involves the following key steps:

- development of a planning proposal explaining the details and justification for the plan
- gateway – the Minister (or delegate) determines whether a planning proposal is to proceed
- community consultation
- assessment, decision and drafting.

Recent changes to the plan-making process have delegated some powers back to council, allowing them to finalise particular kinds of LEPs. Key information requirements for consideration in the planning proposal that are particularly relevant to this study include:

- demonstrated consistency with relevant regional strategy
- soil stability, erosion, sediment, landslip assessment, and subsidence
- water quality
- flooding
- flora and/or fauna.

In undertaking a gateway assessment, the DP&E will consider whether the proposal has strategic merit in being consistent with local or regional strategies and giving consideration to relevant section 117 Directions and State Environmental Planning Policies. The DP&E will also consider whether the proposal has site-specific merit and is compatible with the surrounding land uses, having regard to:

- the natural environment (including known significant environmental values, resources or hazards)
- the existing uses, approved uses and likely future uses of land in the vicinity of the proposal

- the services and infrastructure that are or will be available to meet the demands arising from the proposal and any proposed financial arrangements for infrastructure provision.

2.1.6 Concurrences and referrals

Section 79B of the EP&A Act requires that, before a DA is approved, the consent authority must consult with or obtain concurrence from state government authorities (or other persons) in accordance with requirements to do so in environmental planning instruments.

Concurrence is a term used in the EP&A Act to identify a requirement that an agreement be obtained (normally from a State agency) before a consent authority can decide to grant consent to a development application. A State agency *referral* generally denotes a requirement for a consent authority to seek and have regard to any advice provided by a State agency. Unlike concurrence, a consent authority may still be able to approve a development without a response or support from the referral agency.

In late 2008 the *SEPP (Repeal of Concurrences and Referral Provisions) 2008* improved efficiency in the planning system by removing duplicative or unnecessary referrals and concurrences. There are still a number of issues that need to be considered by state agencies during the DA assessment process as part of the integrated development provisions of the EP&A Act (s91). Those relevant to this study include integrated development triggers under the:

- *Fisheries Management Act 1994* (for works within rivers or waterbodies that might affect fish habitat or threatened species)
- *National Parks and Wildlife Act 1974* (for impacts on Aboriginal cultural heritage values)
- *Protection of the Environment Operations Act 1997* (for licencing of water pollution)
- *Threatened Species Conservation Act 1995 (for impacts on threatened species, populations or ecological communities)*
- *WM Act* (for controlled activities within 40m of a waterfront land).

2.1.7 Exempt and complying development

SEPP (Exempt and Complying Development Codes) 2008 (the Codes SEPP) identifies the majority of development types that can be done as exempt and complying development in NSW:

- Exempt development is very low impact development that does not require approval, so long as the project meets specific prescribed standards. The requirements for exempt development are included in Part 2 of the Codes SEPP, and can vary depending on the development type.
- Complying development is straightforward development that can be approved by a council or private certifier if it meets the predetermined building standards contained in Parts 3, 3A, 4, 4A, 5, 5A, 6, 7 and 8 of the Codes SEPP. Complying development is also subject to conditions of approval to protect surrounding uses during the construction period and the life of the complying development (contained in Schedules 6, 7, 8, 9 and 10).

Clause 1.19 of the Codes SEPP expressly excludes land identified by an environmental planning instrument (LEP) as being within a river front area from being considered as complying development in the General and Rural Housing Codes (Parts 3 and 3A).

Notwithstanding the development controls contained within the Codes SEPP, development within 40m of a waterway also requires a Controlled Activity Approval from Department Primary Industries – Water (DPI Water) in accordance with the *WM Act* (see below). Exempt development (under the Codes SEPP – located outside the defined 40m or 100m river front area) is not precluded from this requirement.

2.2 *Water Management Act 2000*

The *WM Act* provides for the protection, conservation and ecologically sustainable development of the water sources of the state. Whilst predominantly concerned with water rights and uses, the Act also sets out water management principles which relate to riparian areas including:

- Water sources, floodplains and dependant ecosystems (including groundwater and wetlands) should be protected and restored and, where possible, land should not be degraded.
- Habitats, animals and plants that benefit from water or are potentially affected by managed activities should be protected and (in the case of habitats) restored.

Section 91 of the Act provides for the protection and permitting of development within riparian areas (previously Part 3 of the *Rivers and Foreshores Improvement Act 1948*). If a 'controlled activity' is proposed on 'waterfront land', an approval is required and typically requires the development of a vegetation management plan. 'Controlled activities' include:

- the removal of material or vegetation from land by excavation or any other means
- the deposition of material on land by landfill or otherwise
- any activity that affects the quantity or flow of water in a water source.

'Waterfront land' is defined as the bed of any river or lake, and any land lying between the river or lake and a line drawn parallel to and 40m inland from either the highest bank or shore (in relation to non-tidal waters) or the mean high water mark (in relation to tidal waters).

It is important to note that works undertaken by Council and state government Agencies are not affected by the controlled activities provisions.

2.2.1 Water Sharing

Under the WM Act, there are three types of basic landholder rights. Of most relevance to this study is the stock and domestic right, whereby an owner or occupier of a landholding is entitled to take water from a river for domestic consumption and stock watering without the need for an access licence.

Water sharing plans under the WM Act can contain environmental protection provisions that can regulate development generally (e.g. identify zones in which development is to be controlled). However, to date only strategic assessments have been used to streamline development and riparian protection, such as the 'Waterfront Land Strategy' for the Sydney Growth Centres in conjunction with Camden Council and the (former) NSW Department of Water and Energy. Such strategic assessments can provide 'deemed concurrence' to controlled activity approvals where councils are satisfied that the nature of proposed works meet agreed minimum conditions. Guidelines to streamline development or permit applications can assist in providing clarity to applicants on the expected outcomes but should not be used to avoid site assessments altogether.

2.3 *Local Government Act 1993*

The *Local Government Act 1993* (LG Act) guides the operation of local government throughout NSW. The LG Act sets out the councils' charter (clause 8), which is a set of principles that are to guide a council in the carrying out of its functions. A key element of the charter is for councils to:

> *Properly manage, develop, protect, restore, enhance and conserve the environment of the area for which it is responsible, in a manner that is consistent with and promotes the principles of ecologically sustainable development.*

This clearly establishes a responsibility for councils to manage riparian zones within their area to achieve positive environmental outcomes. Under the LG Act, councils are also responsible for the

preparation of Plans of Management for land under their care and control, including land within a river corridor.

2.4 Other legislation

Other pieces of relevant legislation which affect the land use decision making process along the Murray River are summarised in **Table 1**.

Table 1: Other legislation and policy

Act	Overlap with Murray River land use planning
Commonwealth *Water Act 2007*	Enables the Commonwealth, in conjunction with the Basin States, to manage the Basin water resources in the national interest.
Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*	Matters of National Environmental Significance – threatened species and ecological communities, Ramsar wetlands.
Fisheries Management Act 1994	Under the *Fisheries Management Act* Schedule 6, degradation of native riparian vegetation along New South Wales water courses is a key threatening processes (Section 220C).
Threatened Species Conservation Act 1995	Threatened species and communities are likely to utilise or occupy riparian areas. Threatening processes related to riparian areas include: • Alteration to the natural flow regimes of rivers, streams, floodplains and wetlands • Clearing of native vegetation
Native Vegetation Conservation Act 1997	Section 7, Part 1, b State Protected Land
Native Vegetation Regulation 2013	Part 6, section 27 Infrastructure buffer distances Part 4, section 19 Special provisions for minor variations Part 5, section 23 Minor variation of PNF code of practice Part 7, section 58 Identification of protected regrowth on steep or highly erodible land or protected riparian land Part 7, section 59 Limitation of routine agricultural management activities on protected riparian land
Protection of the Environment Operations Act 1997	Enables the classification of waters in NSW and regulate the permissible discharge of pollutants to those waters.
NSW Aboriginal Land Rights Act 1983	Vacant Crown land not lawfully used or occupied or required for an essential purpose or for residential land, can be claimed and returned to Aboriginal people.
National Parks and Wildlife Act 1974	Impacts on Aboriginal cultural heritage values and conservation.

Victorian legislation

The most relevant jurisdiction to compare with Murray River riparian planning controls is Victoria. The NSW-Victorian border for most part comprises the Murray River, with NSW having jurisdiction over the river channel up to the high bank on the Victorian side (Registrar General's Directions, Rivers forming NSW state borders). The MREP2 sets out permissibility and consultation for development on the river (the bed and banks) including up to the high bank on 'the Victorian side' as resting within NSW's jurisdiction.

Planning and development controls covering the riparian zone in Victoria appear relatively uniform compared to NSW, even though it also involves multiple local government authorities (with eight Victorian local government authorities[1]). A more uniform approach is partly attributed to there being very little private land with frontage to the Murray River in Victoria, with most land designated as an Environmental Protection Zone or public reserve. The designation for public purposes of a 60m strip ('3 chain') of crown land from the winter level water mark of the Murray River occurred in 1881 by Order in Council under the provisions of the *Land Act 1958*. There is consequently unimpeded public access within this 60m width for most of its length. A mixture of both private and crown land occurs and extends beyond the 60m width.

Permitted uses within the riparian setback are also controlled by the provisions of local planning schemes. The predominant zoning in local planning schemes within 60m is for public conservation and resources. There are limited sections of the river zoned for farming under local planning schemes, which may be public land subject to the conditions of crown leases for purpose of rural use, or are sections that fell outside the 1881 Order in Council, and consequently are private farming land. Local planning schemes typically include an Environmental Significance Overlay that indicate all or a portion of this riparian setback as requiring consideration in planning approvals.

The crown land adjoining the Murray River within Victoria is managed under the *Land Act 1958,* the *Crown Land Reserves Act 1978,* the *National Parks Act 1975* and the *Forest Act 1958,* depending on the vesting. There are two government approved management plans that also form the basis for the public land management of frontages and floodplains to the Murray River, being the:

1. Mallee Parks Management Plan (NRE 1996), which is the framework for management of that land reserved under the *National Parks Act*,
2. 'Forest management plan for the floodplain state forests of the Mildura forest management area' (DSE 2003).

The Victorian Department of Environment, Land, Water and Planning is responsible for approving any development within the public land frontage of the Murray River in Victoria. Licences for works from the Department may also be required under the *Land Act 1958*, the *Crown Land Reserves Act 1978* or *Forest Act 1958,* or consent under the *National Parks Act 1975*, as well as a planning consent from the relevant local government authority, depending on the type of development/works and the vesting of the land. Planning consent from the local government authority is required for any works that require the lopping, destruction of removal of native vegetation, unless exemptions apply.

The type of development permitted in the first approximately 60m of the riparian zone from the winter level water mark of the Murray River in Victoria is restricted to that allowed under the zoning in the local planning scheme, and the provisions in the planning scheme for limitations in development within the riparian zone indicated in the Environmental Significance Overlay. For land vested under the *National Parks Act 1975*, the type of conservation and recreational associated development allowed is further controlled by zoning indicated in the Mallee Parks Management Plan (NRE 1996). For leased crown land frontages, the type of development allowed will be determined by the respective lease conditions.

[1] Rural City of Mildura, Rural City of Swan Hill, Shire of Gannawarra, Shire of Campapse, Shire of Moira, Shire of Indigo, City of Wodonga, Shire of Towong.

Frontage Action Plans (FAPs) have been developed to integrate and coordinate the management of Crown land frontages along the Murray River[2]. Whilst FAPs do not apply to private land, their objectives and management actions may also be relevant to the management of adjacent private land frontages, or within the Murray River floodplain, beyond the generally 60m setback.

South Australian legislation

Most of the land along the banks of the Murray River in South Australia is also reserved as crown land. In most locations, this is an area of approximately 30-50m width measured from the water's edge. This may extend back further where there is a significant wetland or high conservation value. Under the *Crown Land Management Act 2009* permission must be sought before any excavation, works or development takes place on any parcel of crown land, including a development approval (where applicable) from the SA Department of Environment, Water and Natural Resources). Licensing for structures or use of land that may restrict public use, create a potential public risk, or create the perception of private ownership, are unlikely to be approved. The possible perception of private ownership is supported by there being some areas of private ownership to the water's edge.

The SA *River Murray Act 2003* requires that applications and planning documents are referred by the local planning authority to the Minister for Water and the River Murray. The Minister may seek comment from stakeholders/experts, and then give direction or advice to the relevant authority to ensure development activities are undertaken in a way that minimises harm to the river.

2.5 NSW Government policy

Flood Prone Land Policy

The primary objective of the policy is to reduce the impact of flooding and flood liability on individual owners and occupiers of flood prone property, and to reduce private and public losses resulting from floods, utilising ecologically positive methods wherever possible.

The policy provides for the consideration of ways to maintain and enhance riverine and floodplain ecology through the development of floodplain risk management plans. Local government is responsible for the preparation and implementation of these plans, although technical and financial support is provided by other state agencies such as the Office of Environment and Heritage.

The Floodplain Development Manual guides the development of flood liable land for the purposes of section 733 of the LG Act. The Floodplain Development Manual sets out the Floodplain Risk Management Process (**Table 2**) which includes the development of floodplain risk management plans that link with Council's strategic planning processes.

[2] Frontage Action Plans were developed in response to the recommendations of the Mallee Review of Crown Water Frontages Final Report (Sustainable Productions, 1999) and Mallee Waterway & Floodplain Management Strategies (Mallee CMA, 2001) as a means of integrating and coordinating the management of Crown land frontages along the Murray River (Reference: Murray River Frontage Action Plan Merbein To South Australian Border, Mallee Catchment Management Authority (CMA) 2003)

Table 2: Floodplain Risk Management Plan development process

Step	Tasks
Establish Floodplain Risk Management Committee	Established by Council and must include community groups and state agency representative
Data collection	Compilation of existing data and collection of additional data.
Flood Study	Define the nature and extent of the flood situation, in technical terms.
Floodplain Risk Management Study	Determine options in consideration of social, ecological and economic factors relating to flood risk.
Floodplain Risk Management Plan	Preferred options are publically exhibited and subject to revision. Formally approved by Council after exhibition and revision.
Plan Implementation	Implemented by Council

The NSW State Rivers and Estuaries Policy (NSW Water Resources Council, 1993)
The main objectives of this policy are the management of rivers and estuaries to:

- slow, halt or reverse the overall degradation in their systems
- ensure the long term sustainability of their essential biophysical functions
- maintain the beneficial use of these resources.

One of the principles of this policy is that environmentally degraded areas should be rehabilitated and biophysical function restored. The policy does not provide any specific mechanisms to affect this principle and is seldom used in land use determinations.

NSW Wetlands Policy (DECCW, 2010)
It is the policy of the NSW Government to promote the conservation, sustainable management and wise use of NSW wetlands for the benefit of present and future generations. Adoption of the NSW Wetlands Policy means that in making decisions government will give explicit consideration to the biophysical requirements of wetlands with the goal of ensuring their sustainable management.

This policy aims to assist in the protection of wetlands in good condition, rehabilitate degraded wetlands where feasible, and support appreciation of wetlands by:

- protecting wetland biodiversity, functions and services
- protecting social and economic benefits of wetlands
- providing flow regimes that mimic natural conditions, where possible
- providing wetlands with water of appropriate volume and quality
- limiting further fragmentation and reconnecting wetland systems
- preventing or limiting catchment activities that impact upon wetlands
- protecting the cultural heritage and spiritual significance of wetlands
- rewarding wetland managers who improve the condition of wetlands
- promoting the importance of wetlands to the community.

Policy and Guidelines for Aquatic Habitat Management and Fish Conservation Update (NSW DPI, 2013)
These policies and guidelines focus on promoting compliance with legislation relating to fish habitat conservation and management. NSW DPI considers these policies and guidelines when assessing proposals for developments or other activities affecting fish habitats. General provisions include:

- Fish and their aquatic habitats are important natural resources, and impacts on these resources must be assessed, in all development and planning procedures, using a precautionary approach.

- Terrestrial areas adjoining freshwater, estuarine and coastal habitats should be carefully managed in order to minimise land use impacts on these aquatic habitats. As a precautionary approach, foreshore buffer zones at least 50 m wide should be established and maintained, with their natural features and vegetation prescribed, and
- Riparian buffer zones are measured from the top of bank for Class 1-3 waterways.

2.6 Other plans

In addition to the planning mechanisms mentioned, development along the Murray River is also guided by:

- The Basin Plan (2012)
- Draft Murray River Regional Strategy (2009)
- NSW Murray Biodiversity Management Plan (2012)
- Murray Catchment Action Plan 2013-2023

2.6.1 The Basin Plan (2012)

The Basin Plan is a requirement of the Commonwealth *Water Act 2007* and guides the management of the Murray Darling Basin. It provides a coordinated approach to water use across the four Basin states – Queensland, NSW, Victoria and South Australia.

Under the Plan, water use is limited at environmentally sustainable levels by determining long term sustainable diversion limits for surface- and groundwater resources. The Basin Plan includes a number of sub-plans and requirements, including:

- an environmental watering plan to optimise environmental outcomes for the Basin
- a water quality and salinity management plan
- requirements that state water resource plans need address in order to be accredited A mechanism to manage critical human water needs
- requirements for monitoring and evaluating of the implementation of the Basin Plan.

2.6.2 Draft Murray Regional Strategy (2009)

The Draft Murray Regional Strategy was released for public comment in 2009, but was not finalised or formally adopted due to the change of government in March 2011. Nonetheless this draft strategy has been used to guide local council strategies and SI LEPs along the Murray River. The purpose of the draft strategy was to present the NSW Government's vision for the region encompassing the ten local government areas along the Murray River, and guide sustainable growth and development. The draft Strategy was also the first step in the repeal of the MREP2 the intent being to transpose planning provisions of the REP into a strategic planning instrument to guide growth.

The draft Strategy had the following aims:

- Bringing a strategic approach to land use planning in the Murray Region that would serve until 2031.
- Protecting and managing the sensitive riverine environment of the region's major waterways.
- Cater for housing demand, prepare for an aging population and ensure an adequate supply of employment land.
- Reinforce the role of Albury as the region's major centre while managing growth aspirations in other centres.
- Ensuring tourism is facilitated in appropriate locations.
- Protect the rural landscape and natural environment by managing urban sprawl through strategic land use allocation.
- Developing a positive relationship with Victoria on cross-border issues.

- Ensure the land use planning system responds to changing circumstances and ensures preparedness for growth.
- Recognise, value and project the heritage values of the region.

The draft strategy introduced the model LEP provisions for development on riverfront areas and river-based developments. These provisions contained 40m and 100m setback requirements which were based on the advice from government agencies including OEH, DPI Water, DPI Fisheries NSW and the MDBA and consistent with the existing setbacks contained in local environmental plans in the region. In the drafting of the provisions, it was not the intention to allow flexibility or variation to the prescribed setback distances, except where infill development opportunities exist in an urban setting (see Section 3.3).

2.6.3 NSW Murray Biodiversity Management Plan 2012

The Murray Boating Management Plan identifies priorities for efficient and effective investment in terrestrial biodiversity management across all tenures and land uses in the NSW Murray catchment. Information contained in the Murray Boating Management Plan has been used to inform the new Murray Catchment Action Plan (see below), and other NSW Government and Australian Government strategies.

2.6.4 Murray Catchment Action Plan 2013-2023

Local Land Services are required to develop regional strategies to inform the development of local land services across the regions. Until these strategies are developed the Catchment Action Plans (CAPs) developed previously by Catchment Management Authorities will remain in place.

The Murray CAP was developed with extensive stakeholder and community input in 2012, and provides a 10-year strategic plan which includes programs to improve the health, productivity and resilience of regional landscapes and communities. The primary goals of the Murray CAP are:

- Viable, capable and culturally rich communities.
- A healthy and biodiverse environment with connected ecosystems that are understood, valued and respected.
- Diverse and profitable local economies built on sustainable and adaptive businesses and production systems.
- Capable and empowered communities with supportive leadership.
- Landscapes and communities adapted to climate variability and long-term climate change.

3 Issues

A number of common issues emerged during the course of the information gathering phase for this study. These centred on the common themes which are discussed below:

- science
- setbacks and buffers
- urban development
- flooding
- environmental watering
- climate change
- tourism and recreation
- constraints to funding and capacity.

It is acknowledged that there are other issues not discussed below with relevance to riparian management. These have not been addressed in detail in this report because they were not raised during the consultation process.

3.1 Science

In many respects the Murray River is a well-studied system, with a body of information available about its values and associated threats. There are, however, some key areas where the science to support policy decisions and/or address public perceptions is lacking or being questioned. This can result in policy decisions around planning issues not being based on the best information which in turn may deliver sub-optimal outcomes.

"Good news stories" resulting from scientific studies are often poorly communicated. This includes poorly communicating the science used to support policy decisions which can result in a lack of understanding about decision making processes and low public support for policy. This is a common problem across all fields of science, whereby scientific communication is focused on publication in peer reviewed journals, not broad communication in accessible language to the general public.

Persistent gaps in scientific knowledge have been consistently reported through consultation along the Murray River. These include:

- flooding (mapping of extent, behaviour, risk)
- contributing causes of bank erosion e.g. what impact does high speed boating have on bank erosion?
- cumulative impact of multiple developments e.g. proliferation of moorings, ribbon development and associated infrastructure such as jetties
- uncertainty about the effects and necessary responses to climate change.

The inability to provide scientific certainty around these issues also undermines scientific credibility across areas where good science is available to support decisions. For example:

- Poor communication of the scientific justification behind river setback distances contributed to Council's angst when the 40m and 100m setback distances were introduced in the SI LEP model clauses, and Council's perception was that arbitrary distances were being imposed on them. It is noted however, that all Councils already had similar or greater, river setback distances in their penultimate planning instruments.

- Local inaccuracies in some environmental overlays (e.g. Key Fish Habitat Areas) have undermined their credibility as a useful tool for Councils and resulted in some resistance to their adoption.

3.2 Setbacks and buffers to urban development

3.2.1 What are setbacks and buffers?

For the purposes of this review a setback is defined as 't*he distance which a building or other structure is 'set back' from the river from an identified reference point'*. A 'setback' differs from a 'riparian buffer' in that the buffer implies or requires native vegetation to be present in order to provide the full suite of benefits. In analysing the implications to planning and development along the Murray River, buffers and setbacks have been considered together throughout this review.

3.2.2 Review of literature on setbacks and buffers

There is strong scientific evidence to support the application of river front setbacks to protect riparian values, including:

- environmental values: water quality, biodiversity, in-stream values (aquatic), riverine corridor, floodplain, wetland and catchment
- cultural heritage values: historic sites, Aboriginal sites, archaeological sites, cultural values
- scenic and landscape amenity values: riverine landscape character, open space, recreation and tourism, and
- economic values: grazing, water quality and supply, recreation and tourism, infrastructure and services, timber harvesting and agriculture.

A number of studies indicate various minimum riparian buffer widths are required to support particular management objectives or to maintain specific aspects of landscape function. DIPNR (2005) provided the following information from a 1992 literature review called '*The Importance of the Riparian Zone in Water Resource Management*':

- NSW Department of Agriculture in 1991 stated that a 40m buffer of native vegetation can almost completely stop silt entering watercourses.
- NSW DPI Fisheries in 1986 stated that a 30m buffer of native vegetation is required to protect freshwater habitat.
- Victorian Department of Conservation and Environment in 1990 stated that a 30m buffer is required for watercourse protection from sediments, fertilisers and other pollutants.
- A study by Kelly and Barry in 1986 shows a 50-60m wide vegetated area is required to protect watercourses (this is a practical modification from their 80-100m estimates for long term retention of wildlife).

International literature reveals similar recommendations for river front setbacks (typically incorporating vegetated buffers within the setback), to achieve certain environmental functions to protect water quality and aquatic habitat values. Wegner (1999) collated information from 140 references to establish a legally-defensible basis for determining riparian buffer width, extent and vegetation, and concluded:

- A 30m vegetated buffer is sufficiently wide to trap sediments under most circumstances, although buffers should be extended for steeper slopes.
- In most cases 30m buffers should provide the width necessary for reducing nitrate concentrations depending on local hydrology, soil factors, slope and other variables with 15 m buffers sufficient under many conditions.
- 10-30m native forested riparian buffers should be preserved or restored along all streams to maintain aquatic habitat.

- That for riparian buffers to be most effective, some related issues must also be addressed. These include reducing impervious surfaces, managing pollutants on-site, and minimising buffer gaps.

A review by Jontos (2004) found recommended widths vary across the scientific literature. This information was summarised to recommend riparian buffer widths as per **Table 3**.

Table 3: Recommended widths of buffer zones (Jontos 2004)

Buffer function	Description	Recommended width
Water Quality Protection	Buffers, especially dense grassy or herbaceous buffers on gradual slopes, intercept overland runoff, trap sediments, remove pollutants, maintain water temperature and promote ground water recharge. For low to moderate slopes, most filtering occurs within the first 10m, but greater widths are necessary for steeper slopes, buffers comprised of mainly shrubs and trees, where soils have low permeability, or where Nitrogen Phosphorus and Sediment loads are particularly high.	5 to 30m
Stream Stabilisation	Buffers, particularly diverse stands of shrubs and trees, provide food and shelter for a wide variety of riparian and aquatic wildlife	10 to 20m
Riparian Habitat	Riparian vegetation moderates soil moisture conditions in stream banks, and roots provide tensile strength to the soil matrix, enhancing bank stability. Good erosion control may only require that the width of the bank be protected, unless there is active bank erosion, which will require a wider buffer. Excessive bank erosion may require additional bioengineering techniques.	30 to 500m +
Flood Attenuation	Riparian buffers promote floodplain storage due to backwater effects, they intercept overland flow and increase travel time, resulting in reduced flood peaks.	20 to 150m
Detrital Input	Leaves, twigs and branches that fall from riparian forest canopies into the stream are an important source of nutrients and habitat.	3 to 10m

Land and Water Australia (Price et al 2005) provide guidance on minimum riparian buffer widths which are similar to the minimum distances indicated by the literature as summarised in **Table 4**.

Table 4: Recommended minimum riparian widths by Land and Water Australia (2005)

Management objective	**Recommended minimum width to achieve objective**
Improve water quality	5 -10m
Reduce streambank erosion	5 - 10m
Maintain natural light and temperature levels	5 - 10m
Provide food inputs and aquatic habitat	5 - 10m
Provide habitat for fish	5 - 30m
Provide terrestrial habitat	10 - 30m
Manage agricultural production	5 - 10m

Landscape functions of rivers are also driven by scale. There is generally a strong correlation between stream order, stream size and landscape function (Hansen, B et al 2010). The Strahler stream ordering

system is used to define a particular location in the stream channel network. The Strahler stream order concept is illustrated schematically in **Figure 2**. The setback that applies to a waterway at a particular location depends on the position of the site in the stream channel network. Setback distances therefore typically vary in relation to stream order with narrower setbacks being established for small (first order) streams and larger rivers (e.g. fifth order) usually requiring wider setbacks**.**

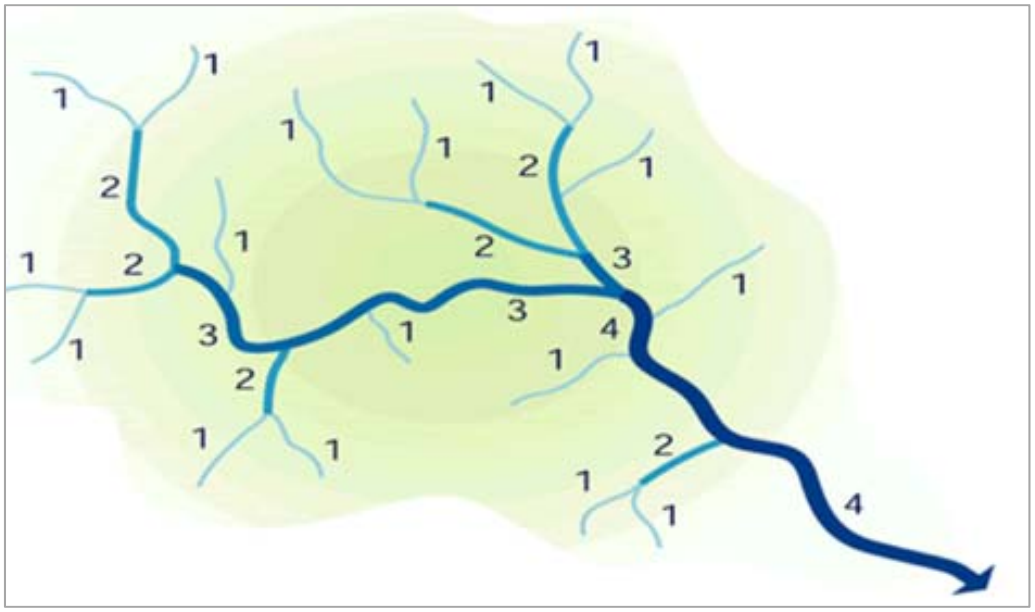


Figure 2: Strahler stream order network

A proportionate increase in setbacks and riparian buffers with higher stream order is justified in terms of the increasingly important landscape functions (such as maintaining water quality, encouraging healthy ecosystems and minimising erosion) that larger river riparian corridors help maintain. In tropical areas, setbacks and riparian buffers may be even larger, reflecting different hydrological regimes and landscape connectivity. **Table 5** compares two recommended riparian buffer distances for temperate rivers against recommendations for tropical river systems.

Table 5: Riparian buffers and stream order

Stream order	Riparian buffer		
	Temperate Rivers NSW (DIPNR 2005)	Framework for Biodiversity Assessment (OEH 2014)	Tropical Rivers Northern Territory (NRETAS 2010)
Unmapped / 1st order	20m	10m	25m
2nd order	20m	20m	50m
3rd order	30m	30m	100m
4th order	40m	40m	100m
5th order and higher	40m	40m (6th order streams are 50m)	250m

N.B.: Riparian buffer distances relate to one side of the watercourse

3.2.3 How is a setback distance calculated?

Using the definition provided in Section 3.2.1, a setback is calculated from a defined reference point. The most appropriate and effective reference point to calculate a river front setback is the 'high bank', or as it is sometimes referred to, the 'top of bank' (see Section 3.2.4).

In a planning control and regulatory environment where a consistent minimum mandatory benchmark is required, it is not practical to apply different setbacks along the river to achieve different management objectives or protect different aspects of riparian function without corresponding objectives being reflected by the zone objectives. As such, in order to achieve consistency, the application of uniform or standardised setbacks is appropriate to protect basic river functions from development while also allowing most river processes.

This approach was adopted for the SI LEPs, informed by consultation with government agencies including OEH, DPI Water, DPI Fisheries NSW and the MDBA, and review of councils existing setback provisions (see Table 6). During the drafting of the Murray Regional Strategy 2009, the OEH advised the DP&E that the minimum distance for setbacks along the Murray River should be 100m, with 200m the preferred distance. It was determined that a 40m setback would apply to urban areas and a 100m setback would apply in rural areas to protect most or all riparian functions from impacts associated with development.

From the consultation undertaken as part of this project, these setbacks do not restrict or unduly affect the operation of different land uses along the river, including residential, rural and recreational land uses. These standardised setbacks are delivered through defining where the high bank is located in any particular section along the river and the various geomorphological scenarios that exist in the Murray riverine environment. It is critically important that existing setbacks are retained along the Murray River (and its anabranches), to protect people, property and the environment.

3.2.4 What is the high bank?

There is inconsistency in determining what constitutes the 'high bank' with different methods being applied across the councils visited and interviewed as part of the consultation process for this study. Adoption of the high bank principle remedied various interpretations that had been attempted in the past (e.g. weir pool height) and it provided greater consistency with the established convention of cadastral boundaries, which for the most part, are already based on the 'high bank'.

The development of the SI LEP Model Clauses necessitated a consistent method of defining the river bed and banks. Such an approach was required to ensure the setback distances specified in Model Clauses were measured consistently. For example, previously there had been differing practices, some measuring from the bank defined by the average river pool height and some measuring setback distances from within the river channel below the bank.

On the advice of the OEH (during the drafting of the Murray Regional Strategy 2009), the 'high bank' principle was adopted to remove conjecture over finding the 'take off' point (reference point) for river front setbacks and provide a consistent method of defining river bed and banks. The high bank principle adopted was consistent with the definition of 'highest bank' in the *WM Act* as found in the definition of *'waterfront land' which* means:

> *(a) the bed of any river, together with any land lying between the bed of the river and a line drawn parallel to, and the prescribed distance inland of, the **highest bank** of the river, or*
>
> *(a1) the bed of any lake, together with any land lying between the bed of the lake and a line drawn parallel to, and the prescribed distance inland of, the shore of the lake, or*
>
> *(a2) the bed of any estuary, together with any land lying between the bed of the estuary and a line drawn parallel to, and the prescribed distance inland of, the mean high water mark of the estuary, or*

(b) if the regulations so provide, the bed of the coastal waters of the State, and any land lying between the shoreline of the coastal waters and a line drawn parallel to, and the prescribed distance inland of, the mean high water mark of the coastal waters, where the prescribed distance is 40 metres or (if the regulations prescribe a lesser distance, either generally or in relation to a particular location or class of locations) that lesser distance. Land that falls into 2 or more of the categories referred to in paragraphs (a), (a1) and (a2) may be waterfront land by virtue of any of the paragraphs relevant to that land'.

The adoption of the 'high bank' definition to define the river bank, as opposed to the limit of the pool height in the river channel, is facilitated by the cadastre, where survey practice finds the high or highest bank for the purposes of establishing title. This procedure is long established by the Registrar-General for determining natural boundaries, and makes it simple for Councils to map setbacks using GIS (LPI 2015).

Further, SI LEP drafting resulted in the application of 'W' or Waterway zones covering the cadastral based river channel, measured from high bank to high bank. The high bank is represented as 'HB' across a variety of stylised valley cross sections in Figures 3-7.

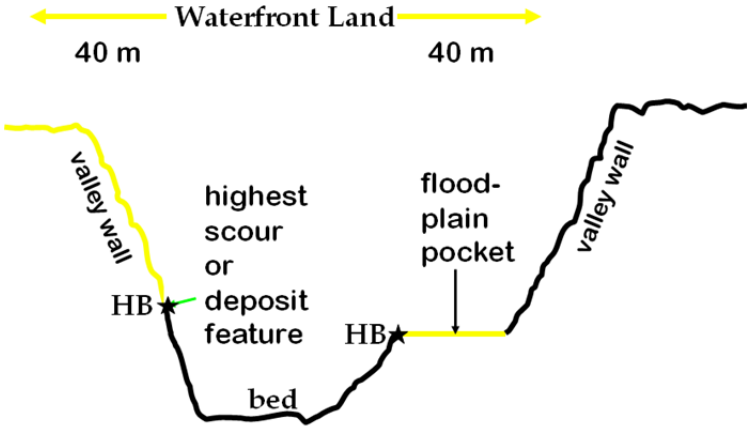


Figure 3: Stylised cross section of a definition of waterfront land typical of the river above the Hume Weir and gorges to the mountains (e.g. Tumbarumba and Albury LGAs)

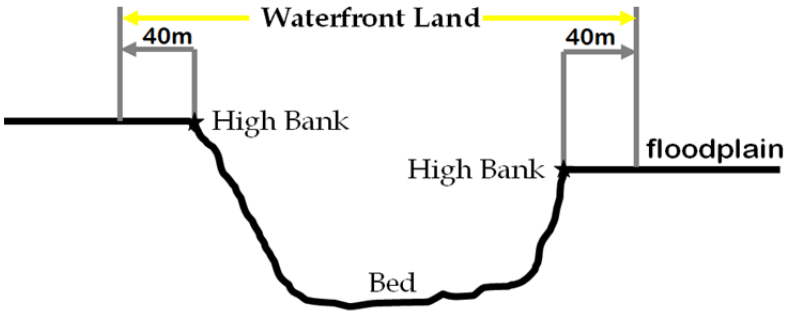


Figure 4: Stylised cross section of a definition of waterfront land typical of the river in partly confined and bedrock controlled environs (e.g. below the Hume Weir)

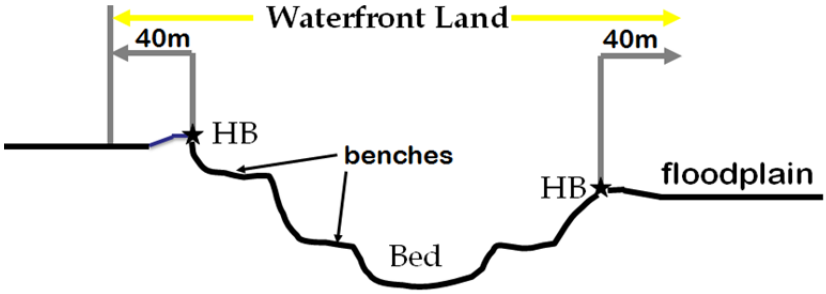


Figure 5: Stylised cross section of a definition of waterfront land typical of the river in an alluvial valley with continuous channels, meandering, and low sinuosity (e.g. Corowa)

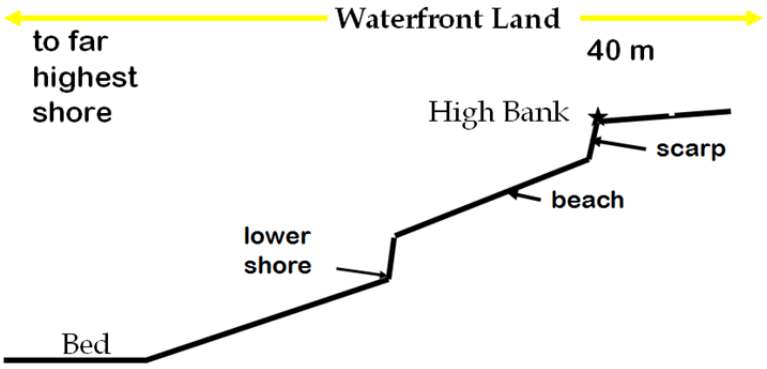


Figure 6: Stylised cross section of a definition of waterfront land typical of an anabranching river (e.g. Moama)

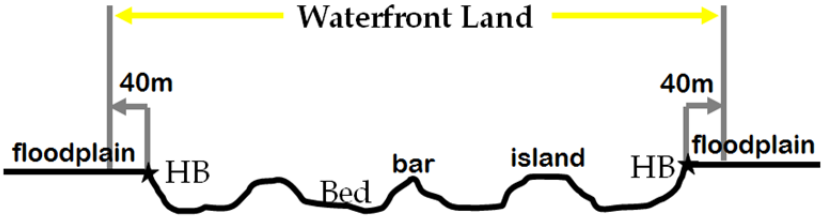


Figure 7: Stylised cross section of a definition of waterfront land typical of a Lake or regulated weir (e.g. Wentworth)

There are some historic titles along the River which adopt the *Ad Medium Filum Aquae*[3] principle (literally, the 'middle thread of the river'). Even in these cases the adoption of the 'high bank' principle means determining setbacks is practical and straight forward.

[3] Where the boundary of a parcel extends to the centreline of the stream (either by adopting an existing centreline definition as set out in the base plan or through a successful claim of *Ad Medium Filum Aquae*) the new plan must define both banks and the centreline of the stream. Two areas must be shown for the parcel (one bounded by the bank and one bounded by the centreline) (NSW Registrar General).

3.2.5 Planning controls for setbacks and buffers

Setbacks in Local Environmental Plans – Dwellings

During the drafting of the Murray Regional Strategy 2009, a section 117 Direction was prepared requiring councils to include the prescribed 40m and 100m setbacks in their SI LEPs. Most councils included the setback provisions in their SI LEPs that broadly, though not strictly, conformed to the model provisions (see **Table 6**).

Table 6: Comparison of historical and current Murray River development setbacks

LGA - LEP dates	Previous LEP setback	Current LEP setback
Albury – 2000, 2010	100m	40m – Zone R5 or an urban release area 100m Zones RU1, RU2, RU4, E2 and E3
Balranald – previous, 2010	Operated under an old Interim Development Order	40m – Zone RU5 100m – Zone RU1, RU3 and RU4
Berrigan – 1992, 2013	100m	40m – Zone R5 and RE2 100m – Zone RU1 and E3
Corowa – 1989, 2012	100m 400m for any building in Zone 7(a)	40m – Zone R1 R2, R5 and B2 100m – Zone RU1, RU3 and E3 Has a variable riverfront building line mapped in LEP
Hume – 2001 Greater Hume – 2012	100m from the Murray River 40m from any other watercourse (excl. Murray River) Above 1 in 100yr flood level of Murray River (Rural Environment) zone	40m –Zone R2, R5 and RU5 100m – Zone RU1, RU3, RU4, W1 and W2
Murray – 1989, 2011	60m	40m – Zone RU5, R1, R2, R5, SP3 and B2 100m – Zone RU1, RU3 and E3
Tumbarumba – 1988, 2010	None	None
Wakool – 1992, 2013	100m	40m – Zone RU5, Zone R1, R5, B2, B6, IN1, RE1, RE2 and SP2 100m – Zone RU1, RU3 and E2
Wentworth – 1993, 2011	30m	40m (with variable setback in some areas e.g. 30m Riverton Farm development – clause 7.9) Has a variable riverfront building line mapped in LEP
MREP2	Set well back from bank of the River Murray	

Note: Tumbarumba LGA was not included in the Draft Murray Regional Strategy 2009

Current LEP provisions (post draft Murray River Regional Strategy 2009) have modified the model setback provisions in terms of the equivalent definitions and zoning, but not in respect of setback distances (although Tumbarumba Shire has no setback provisions). It is not clear whether any particular review processes or overarching requirements for consideration were applied in reaching the variation in setback provisions currently in place through LEPs, i.e. what process Councils went through in applying the setbacks in zones other than those specified in the model clauses. It should be noted that during consultation some Councils expressed that there was a need to 'just get the new LEP finalised', while some appear to have negotiated their way to a reduced setback (from 400m to 100m) without strategic justification.

The SI LEP model clauses trigger few development applications (DA's) i.e. less than 10 per year per LGA on average. This low frequency indicates the provisions do not represent over-regulation - particularly given the sensitivity and importance of the Murray River system. The perceived prohibitive nature of the river front development clause is generally disliked by councils and land developers looking to utilise riverfront urban development precincts to attract economic growth and design lot layouts adjacent to the river foreshore. However, the impact of setback provisions on such development outcomes is limited and given the significance of the river for current and future users, it is considered appropriate.

During the drafting of the Draft Murray Regional Strategy 2009, consideration was given to an option for Councils to develop their own setbacks (i.e. apply a setback less than the standard 40m and 100m distances). This is still an option for Councils. Justification for a reduced setback requires councils to demonstrate how the proposed river setback satisfies the objectives of the current model clauses, as well as indicate what measures would be implemented to ensure compliance with the setbacks including but not limited to:

- Details on how the reduced setback would meet objectives such as maintaining and improving water quality, protecting the environmental values of rivers, protecting the stability of the bed and bank, and limiting the impacts on natural riverine processes and navigability.
- Variation in response to circumstances and topography (mapping would be expected to provide a detailed survey of the river bank, the extent of flooding, vegetation and other riverine habitat, as well as existing development and structures).
- Justification in terms of setback design. Setbacks would need to be of adequate distance to ensure design parameters were met such as not increasing erosion, no new development located on outside of river bend, location an appearance of structures to be compatible with surrounding area, no adverse effect on riverine, flora or fauna habitat, not adversely effecting drainage or flow patterns.

The inclusion and retention of setback provisions in LEPs is strongly supported as they provide the most effective mechanism for consistently protecting riparian values along the Murray River.

Ancillary development

The referral of ancillary development (development ancillary to a constructed dwelling) within the prescribed 40 m setback, occurs more frequently than DAs related to setbacks, and it appears less targeted and efficient. Consultation indicates these ancillary development triggers and referrals are often confused (or combined in people's minds) with the setback provisions. Current development controls within the 40 m setback area complicate (or restrict) development associated with existing dwellings e.g. house extensions, sheds, and pools. Development must be located behind the building setback, except for development which is defined as functionally dependent on the river. This prevents 'development creep' and modification of development into inappropriate land uses (e.g. converting existing outdoor decks into habitable spaces) within the prescribed setback.

Setback variations

Setback clauses for riverfront development in LEPs were developed by the DP&E as a means to limit inappropriate development along the riverfront. It was not intended for there to be a mechanism for variation to setback clauses.

There is precedent in law which calls into question this approach. The Court of Appeal in *Lowy vs The Land and Environment Court of NSW & ORS (2003*)) – on appeal from the NSW Land and Environment Court, held the view that the LEP special provisions are able to be varied by State Environmental

Planning Policy No. 1 – Development Standards (SEPP 1). In *Lowy*, the Court established the provisions could be deemed subject to SEPP 1 consideration but did not go on to determine the merit of the case. SEPP 1 provisions have been replaced by Clause 4.6 of SI LEPs (SEPP 1 provisions remain in place for any land which is currently deferred from SI LEPs).

There may be divergence in judicial opinion in the area of variation to development standards and it is a highly litigated subject. It is noted however that the *Lowy* decision pre-dates the SI LEP program and for this reason, it would be expedient for the DP&E to specify, redraft and communicate that the model setback clauses are a prohibition. This would provide a more definitive position and remove any basis for litigation. However, as the model provisions already operate successfully, the legal costs and additional resourcing of such action needs consideration.

Most councils are supportive of a consistent approach to setbacks as it also prevents competition between LGAs for housing and tourism development and investment. Regardless, councils can review and redraft building setbacks as part of Planning Proposal preparation. The transparency and consistency in riverfront development across the region provided for by DP&E's position on the model provisions are justified given the environmental, social and economic significance of the Murray River and the overwhelming public interest in its protection, i.e. the public good outweighs private gain. There also appears broad inter-agency support for this position from the OEH, DPI Water and the MDBA who assisted the DP&E in drafting the model river provisions to warrant the label of a 'whole of government' approach.

Assumed concurrence for setback variations

On the 18 July 2001, the Director-General of the then Urban Affairs and Planning, partially revoked councils assumed concurrence delegation for variations to riverfront setbacks along the Murray River. This revocation did not apply to Wentworth or Balranald Councils.

This partial revocation resulted in councils retaining assumed concurrence delegation only for the erection of a building or carrying out of work where the development does not encroach any further into the prescribed riverfront setback area than the existing building line. This partial revocation resulted in councils requiring concurrence from the DP&E for any new development (other than those specified) which sought to vary the prescribed riverfront setback requirements as contained in LEPs. This is approach is considered appropriate and provides a consistent approach to development along the river.

Regional challenges

The extent of where the setback provisions impact on desired development outcomes appears limited and given the significance of the river, setbacks are considered the most appropriate mechanism to manage development along the river. A challenge in developing setbacks for the Murray River lies in the variable nature of the river along its length. Whilst all agencies (state and national) are highly supportive of the objectives of the model setback clauses, there are divergent views about applying a consistent setback distance (for both urban and rural zones) along the river.

One view is that consistent planning rules along the entire length of the river are not appropriate because of the different geomorphology, historical and existing uses and management practices on the river. However, variable setback distances could introduce inequities and could influence property markets in an unfair and disadvantageous manner. Allowing the development and application of 'local setbacks' based on a merit based system relies on local authorities acting in the interests of the whole river, which can be difficult particularly when they are generally influenced by local needs and demands.

If councils were to develop 'local setbacks' (specific to an individual LGA), this would need to be done via a rigorous process and subject to the approval of the DP&E to ensure both environmental and other (social, economic) considerations are accounted for in a regionally appropriate manner. Considerations for such an approach are provided above (under *Setbacks in Local Environmental Plans – Dwellings*).

On balance, consistent setback distances are considered the most appropriate and practical means of achieving the objectives of the model clause which are well supported across the entire region.

3.2.6 Protection and restoration of buffers

The required extent of any vegetated riparian buffers will depend on the distances/areas needed to protect or restore the existing vegetation to achieve connectivity to the floodplain and larger patches of remnant vegetation.

Some public open spaces are restored along the river typically due to an empowered or determined resident. Given the relatively small area urban frontage occupies along the river, the impact of providing riparian buffers in new developments will be negligible at a whole of river scale. Existing development and urban areas are therefore not priorities for restoration of native riparian vegetation.

In NSW remnant native vegetation is protected by the *Native Vegetation Act 2003* and the *Native Vegetation Regulation 2013*. Riparian areas on 'Prescribed Streams'[4] are also defined as Category B State Protected Land under the *Native Vegetation Conservation Act 1997* (NVC Act). While the *Native Vegetation Act 2003* regulates clearing of live native vegetation, the clearing of dead native vegetation or exotic vegetation on state protected land (SPL) is still regulated by the NVC Act. This legislation does not however apply areas zoned for urban use.

Some Councils have local Tree Preservation Orders to protect significant trees including within urban zoned lands. It is considered however that without consolidating land ownership along the river (as per Victoria's 60m Crown Land Reserve), incremental fragmentation of the riparian vegetation via activities associated with private land development and use will continue.

3.2.7 Long term management considerations

The establishment of river setbacks has generated specific management issues, including:

- Who is responsible for management of this riparian land?
- Who pays for their maintenance?
- Who assumes bushfire risk reduction responsibilities?
- What activities can be conducted on these areas and by whom?
- Managing public access and safety of riparian buffers especially where they adjoin urban and recreational areas.

Resolution of such management issues requires further investigation and consultation with councils, government agencies and the community. The detailed investigation and resolution of such issues falls outside the scope of this project.

[4] The Restrictions on the Removal of Trees on New South Wales Watercourses booklet provides a comprehensive list of all prescribed streams (RestrictionsOnTheRemovalOTreesOnNSWwatercourses.pdf)

3.3 Agency referrals

Provision of the MREP2 (Part 3, clause 13) outline the consultation requirements for any specified development. In theory this is useful for councils in determining which agencies should be consulted as part of a development assessment. However, these provisions are now considered anachronistic by many councils, as the clause refers to consultation with agencies which no longer exist, or have changed names (some agency names listed are outdated by more than 10 years). This has contributed to frustrations associated with the MREP2. Councils do not have clear guidance when determining which agency requires consultation for particular developments.

During consultation it was highlighted that there is an issue with the number of seemingly unnecessary referrals being forwarded to agencies (triggered under the provisions of the MREP2). For example DPI Fisheries are referred DAs that do not trigger the Fisheries Management Act 1994 as the proposed development doesn't relate to instream works e.g. jetties, pontoons, and retaining walls. Similarly, DPI Water also receives approximately 50-60 referrals a year from the MREP2 provisions that don't require approval under the WM Act.

Under the current planning framework each individual project has to be assessed on its individual merits in isolation from what else is happening up or down stream. A mechanism for consideration of cumulative impact is missing. Any review of the current MREP2 should seek to adopt a strategic approach to development along the river that takes a regional (whole length of river) approach.

In reviewing the MREP2, the existing river based development clauses should not be altered. However, there is considerable opportunity for state agencies to develop compliance codes for ancillary developments for river based development which would improve:

- community support for development processes
- assessment times
- application and ancillary costs and considerations
- ability of development to meet the objectives of the clause.

For example pump house construction is common, subject to land title restrictions on their location, and could significantly benefit from inclusion as a development type, under complying development controls.

3.4 Infill development

Along the Murray River there are parcels of land which are vacant (without a constructed dwelling onsite) zoned for urban land uses and are located within the prescribed 40m river setback.

Consultation and GIS analysis of LEP zoning layers has indicated this situation is of very limited extent. For example, in Murray Shire there are only three lots zoned urban within the 40m setbacks that are not developed. Furthermore, there is only approximately 90 hectares of vacant land zoned for residential purposes (R1, R2, R5, RU5) along the entire Murray River that is located within the 40m setback area.

It is understood that DP&E has informed councils that infill development can be facilitated in urban zoned areas where the building line of the immediately adjoining properties is used as the setback. This advice needs to be formalised through a protocol (such as a Practice Note or similar) to ensure there is transparency in decision making.

3.5 Exempt and complying development

Currently, exempt development is not excluded from occurring on riverfront land, however Clause 1.19(1)(e)(ii) (Codes SEPP) clearly prohibits complying development types specified under the General Housing Code and Rural Housing Code, from "*being carried out on land identified within an environmental planning instrument as being within a river front area".*

To further increase the applicability of complying development for land located along a river, it is recommended that the Codes SEPP be reviewed to remove the prohibition of Clause 1.19(1)(e)(ii) applying to the entire parcel of identified land. For example, a control that only prohibits complying development being carried out on the part of the land affected by the exemption (i.e. the prescribed setback area) could be inserted, meaning the exemption would then only apply to the land within the 40m or 100m riverfront area, not the entire lot provided there was not clearing of native vegetation/environmental impact. Clear examples include but are not limited to: letterboxes, disabled access ramps, flagpoles, installation of hot water systems and internal alterations. As such, there is scope for more development types to be considered as complying development, where conditions relating to the construction and ongoing management of the development can be implemented via development standards and conditions of consent (contained in Schedules 6 and 7 of the Codes SEPP).

During consultation, it was also identified that the exempt development code could be further expanded to include a number of other common development types, such as pump houses, boat ramps and pontoons. Specific development criteria would need to be developed for these development types, with input from a number of State agencies, including DPI Water, DPI Fisheries and OEH. Concerns were also raised during consultation with Councils around the ambiguity of the use of the word 'minor' for some development types, such as 'Waterway structures – minor alterations'. This term is highly subjective, difficult to interpret and may result in development that is not 'minor', causing significant impacts on the river and the surrounding landscape.

3.6 Ribbon development

Ribbon development occurs when a line of buildings or structures, extend along a road or river, where development is generally unplanned, ad-hoc and not continuous (resulting in 'broken ribbons'). This type of development occurs for several reasons; however ribbon development along the Murray River has occurred primarily to capture residential amenity and private riverfront access. Linear urban development along the river edge often intensifies the bed and bank, aquatic and riparian impacts commonly associated with urban development. Further low density or rural residential living within or adjacent to riparian lands will result in the proliferation of allotments and encroachment, undermining riverine/environmental integrity.

There is a market pressure for living on the lower reaches of the NSW part of the Murray River. This affords an economic premium and lifestyle advantages. There is limited data in various rural land use studies pointing to this type of land release demand (e.g. Wentworth). It is understood anecdotally, that some of this pressure arises from crown land restrictions on development along the river in Victoria and as such people seeking residential properties with river frontages must develop in NSW. Conversely there is low demand for private development in Albury City riverfront areas with only ~70km of river frontage.

There is no reliable data around oversupply or degradation of amenity and corresponding property values. In some cases there is anecdotal evidence of individuals having houses on the NSW bank and working and generally integrating with larger communities in Victoria (e.g. Moama and Echuca,

Buronga/Gol Gol and Mildura). This was not reported as an issue in Corowa, Mulwala, Barooga and Tocumwal.

New developments or changes to existing developments can often lead to:

- removal of riparian vegetation reducing corridor functionality and buffering capacity between land based activities and the river
- reduction in habitat extent and quality
- disruption of natural temperature and water flow regimes
- bed and bank erosion
- soil disturbance including the loss of the soil seed bank
- degradation of aquatic ecosystems
- increased nutrient load depending on fertiliser use and effluent disposal
- increased pollution loads
- increased water extraction (stock and domestic entitlements)
- increased hard stand (non-permeable surfaces) and concentration of runoff
- loss or damage to Aboriginal cultural heritage.

Note: the impacts listed above are not only relevant to ribbon development. These can occur as a result of all river frontage development.

There is a real risk that allowing ribbon development along the river bank will eradicate the amenity first sought by residents. There are also cumulative environmental impacts associated with moorings and jetties, retaining walls, boat ramps and riparian and aquatic habitats resulting in sterile zones of the river. This will ultimately affect the premium residents have paid for such land.

By limiting foreshore ribbon development and protecting riparian/environmental values, councils are supporting riverine amenity and landscape values, ensuring existing property premiums are maintained or increased, decreasing the cumulative impacts on the river via ancillary infrastructure and potentially, reducing emergency and disaster recovery costs.

Strategic planning has already been carried out in most local government areas, which has followed the principles of keeping urban development compact, with new release areas generally located within and adjacent to existing development.

3.7 Climate change

The NSW and ACT Regional Climate Modelling (NARCliM) Project has produced an ensemble of robust regional climate projections for south-eastern Australia that can be used by government, business and the community to plan for the range of likely future changes in climate. In addition, the NSW Government has prepared the *NSW Climate Impact Profile* (2010) to provide an assessment of projected biophysical changes across the State and regional profiles on the potential effects of climate change on natural hazards. These profiles describe the anticipated climate change effects for the Riverina-Murray region.

The MDBA has highlighted that climate change will affect rainfall, stream inflow and water storage throughout the Murray-Darling Basin, but that the effects will be felt differently across various regions. There is considerable uncertainty about the likely impacts of climate change to the Murray River and surrounding region. Currently, the magnitude of this risk is unknown.

The *NSW Climate Impact Profile* (2010) describes the predicted changes to the Murray River and surrounding regions as:

- hotter climate
- decline in total annual rainfall, with a shift from winter to summer rainfall dominance
- substantial declines in stream inflow (due to decreased rainfall and spring melt)
- substantial reductions in plant growth and cover are likely, with resulting impacts to erosion regimes
- increased severity of flooding in urban streams
- widespread changes to natural ecosystems, with wetland and riverine communities worst affected.

There will be widespread implications of climate change, which will impact all sectors of the community, including agriculture and associated irrigation. It is difficult to predict how the projected changes in climate will translate to changes in behaviour in individual sectors and if/how these will be inter-related. Most directly relevant to the planning controls discussed in this report are the predictions that flooding behaviour and water availability are likely to change. However, according to the *NSW Climate Impact Profile*, change in the risk of riverine flooding to property cannot yet be determined. This document does flag the likelihood of flood studies needing to be updated over time.

One of the key difficulties in assessing the impacts of climate change is the inter-related nature of impacts and flow on effects. As the *NSW Climate Impact Profile* highlights, the frequency and intensity of flood-producing rainfall events is likely to increase. However, the actual result of such rainfall depends on the condition of the catchment including, soil moisture (likely to be drier) and water levels in reservoirs (likely lower).

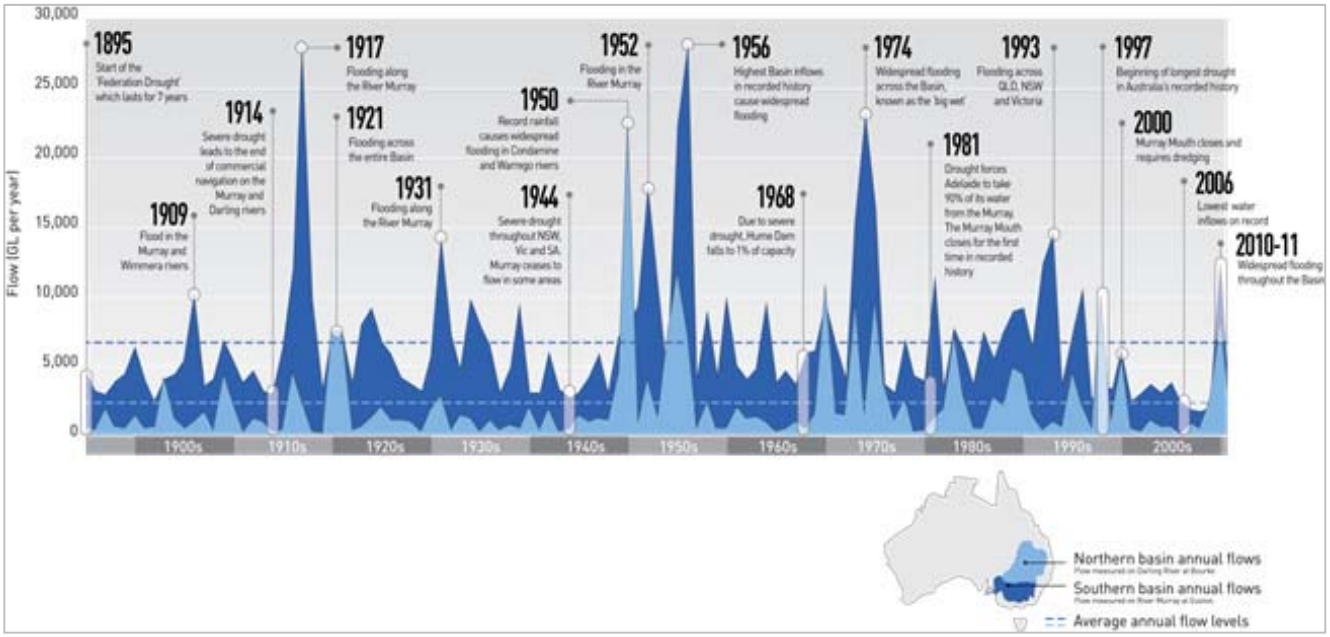
The effects of climate change on rainfall, stream inflow and water storages will directly affect both the water needed and the water available for all users. Given the caps now placed on water extraction by the Basin Plan, allocation of water resources under climate change scenarios will be challenging. Overall, however, the primary need for large volumes of water is still likely to be driven primarily by agricultural and environmental requirements. Whilst urban needs will remain a critical element of the water allocation, they are likely to continue to remain low in an overall sense.

3.8 Development on the floodplain

3.8.1 Flood risks

Large scale flooding is a rare event, however, when it does occur the consequences are severe. It is important to note that the impact of any flood event is dependent on many local and event specific factors. For this reason it is critical that risks be properly considered through the development of Flood Risk Management Plans (FRMP). The historical inflows that lead to floods (and droughts) are illustrated below.

Figure 8: Surface water inflows into the Basin (c/o MDBA)



Councils in the central region of the Murray River generally receive significant forewarning of major flood events (i.e. 3-6 weeks) with current technologies providing accurate estimates of flood heights and timing. This allows the community to prepare for floods in advance and minimise the risk to life, with asset protection being the primary focus. Whilst better technology allows for greater forewarning, development on the floodplain is not supported.

The nature of flooding is different along the river depending on the river geomorphology and flood mitigation measures in place e.g. levees. The effectiveness of these structures depends on their design and on-going maintenance. Future effectiveness of such structures also relies on appropriate consideration of their location, design levels (including appropriate freeboard above the design flood event (FPL)), condition and upkeep when assessing future development proposals i.e. will the development proposal be protected by the levee in its current state?

There are differences in the extent and severity of local flood events generated by a combination of unregulated and regulated system flows, and flooding from the now highly regulated channel of the Murray River. For example, the predictability and advanced warning of flood that residents in Wentworth receive is a consequence how regulated the river has become.

The link between development and flood risk is most pronounced in urban areas. Historically, most farmers have located rural infrastructure and farm assets outside of flood prone areas. Historical urban development within flood prone areas has resulted in a legacy portfolio of assets which are highly vulnerable to damage from flood events.

Flood events typically require emergency and disaster management responses, which come at a considerable cost and present safety risk to emergency response personnel. The risk to life and assets

from flooding is potentially severe. The risk is dependent on the nature, timing, extent and severity of flooding, as well as the adequacy of the response.

In the 2009/10 financial year, the Commonwealth's contribution for natural disaster relief and recovery arrangements was approximately $1 billion, which was matched by state contributions.[5] It is also likely that the insurance market's response to these changes will be higher premiums or refusal of cover for residents in flood liable land and greater scrutiny by local councils in determining development applications and putting forward gateway applications.

3.8.2 Flood studies and planning

The Floodplain Development Manual stipulates that responsibility for managing flood risk lies with Councils, with the development of Floodplain Risk Management Plans as an important step in the Floodplain Risk Management process (see **Figure 9**). A key challenge for Councils along the Murray River is prioritising and funding the development of the works/studies required to prepare these Plans.

Many of the Councils along the Murray River do not currently have flood studies. At the time of writing, Albury and Deniliquin shires were the only two LGAs progressing flood risk planning, with Albury being at the risk management planning phase and Deniliquin having their flood study on public exhibition. Discussions with OEH indicated that a number of councils/towns downstream of Mulwala are in varying stages of developing FRMPs, including Barham, Murray Downs, Tooleybuc and Wentworth. These are due to be completed within two years. Moama has completed their FRMP, and will look to review and upgrade in future. Tocumwal and Barooga (Berrigan Shire Council) and Balranald and Euston (Balranald Shire Council) have currently opted out of the floodplain management program despite efforts promotion and support by OEH.

Issues impacting on Council willingness and capacity to develop flood risk plans as set out in the Floodplain Development Manual include:

- some Councils did not see the relevance of undertaking such a process given either the geomorphology and/or highly regulated nature of the river
- lack of funding and/or resources was an issue
- one Council officer reported significant opposition to undertaking this work from the local Council, due to concerns that it would unduly restrict development.

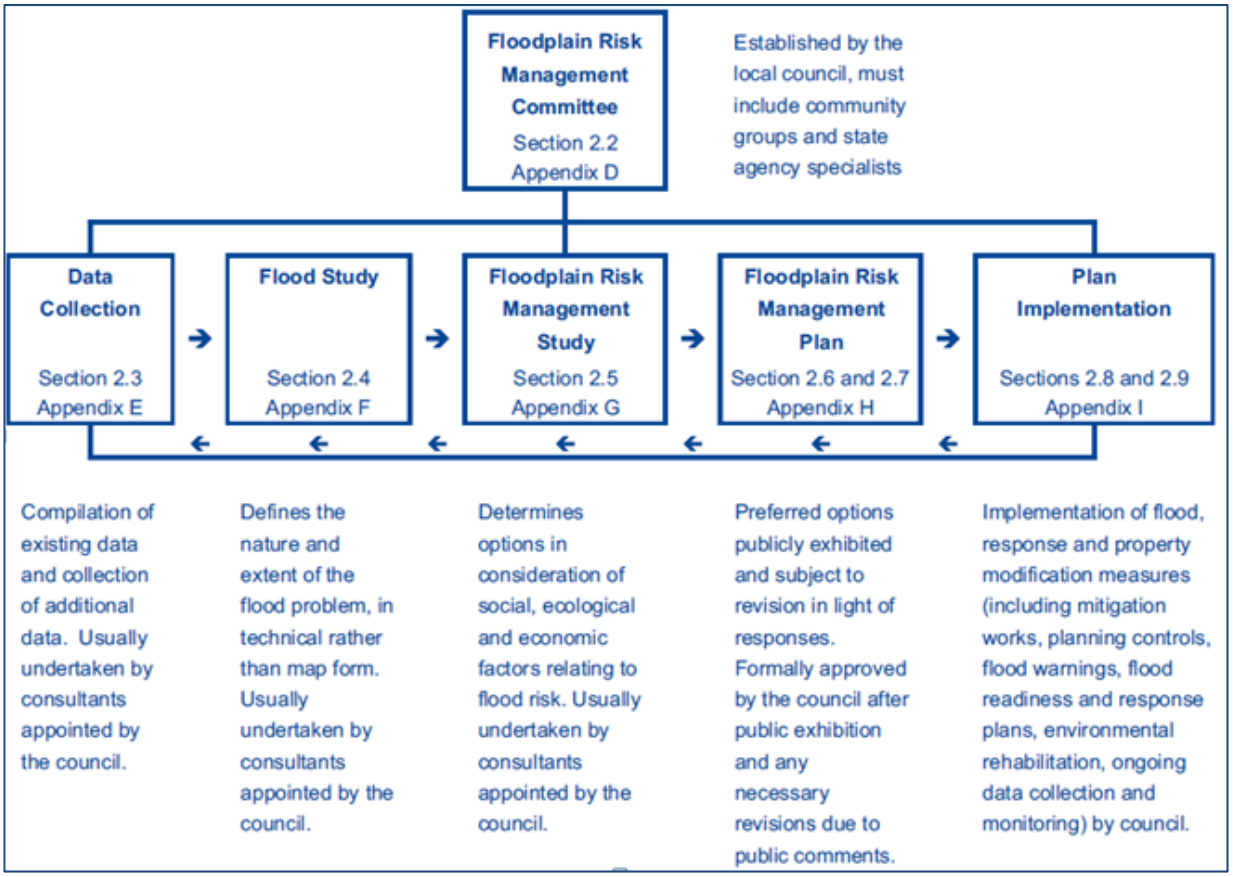


Figure 9: Floodplain Risk Management process

Whilst a lack of resources was an identified issue, councils should be made aware of support available from state agencies e.g. OEH. Albury City Council reported a positive experience in terms of the support they were receiving during their Floodplain Risk Management Plan formulation process. Also, the MDBA has high resolution LiDAR data used to model environmental flow releases and flow paths so as not to impact on residents, communities or infrastructure. Such data sets should be used to review risks, floodways, flood planning levels (FPLs) including probable maximum floods (PMFs) and freeboards. State agencies such as the OEH or DPI Water are considered appropriate conduits for this information to pass between federal and local government agencies.

All councils along the Murray River have adopted the SI LEP model clauses for flood planning[6], which is a considerations clause allowing development on land within or below the 'flood planning level' (defined as the 1:100 ARI flood event plus 0.5 m freeboard), subject to council being satisfied it meets a number of requirements. These requirements include compatibility with flood hazard levels, alterations to flooding regimes, risk to life, environmental effects and social/economic costs to the community.

[6] with the exception of Wakool, which have a minor difference of applying the clause to 'flood liable' land, rather than the 'flood planning level' as per the model clause

The amount of information on flood behaviour and the 1:100 ARI is variable across the LGAs. Some councils (e.g. Wentworth) use historical flood levels as a benchmark for managing flood risk. The lack of robust and consistent quality data compromises the capacity of the SI LEP clauses for flooding to prevent development in flood prone areas in the manner intended.

Instead of LGA-wide strategic planning and evidence-based decision making around flood risk, single developments are considered on a site-specific basis. This is contrary to both the Floodplain Development Manual and consultation undertaken for this study, which both recognised that private or site specific flood plans prepared for individual developments are often ineffectual. Despite the Floodplain Development Manual recommending that such site specific assessment should not be used as the basis of development consent, this seems to be the case in the majority of areas.

Such decision making has also been used during state agency consideration of rezoning applications. The s117 direction to not approve planning proposals (rezonings) on flood liable land can (and has been previously) altered by the Minister. In such cases, the local or site specific consultant's report is used to argue the point and is considered valid in the absence of more holistic floodplain risk management plans. The cumulative impact of such decisions is significant in potentially exposing more private and associated public assets to the impact of flood.

It should be acknowledged that development on flood prone land may be possible in some circumstances where appropriate mitigation measures are in place. In some areas, excluding development on flood prone land may have restricted all development, hence levees have been built. In such areas, consolidation and concentration (infill) development is more prudent and economically responsible.

The importance of flood planning has also been recently highlighted at a national level. The first principle in the *National Strategy for Disaster Resilience* (COAG, 2011) is that effective, risk-based land management and planning arrangements and other mitigation activities are developed and implemented. One of the priority outcomes of the national strategy is that the risks that disasters pose to communities are understood (mapped) and mitigated through appropriate land-use and strategic planning.

3.9 Environmental watering

The Commonwealth *Water Act 2007* contains a requirement for an Environmental Watering Plan (under s22) which provides a framework for environmental watering within the Murray-Darling Basin. One of the Basin Annual Environmental Watering Priorities for 2014-15 is to improve the connectivity of the River Murray system, via the delivery of water as a longitudinal pulse(s) from the Hume Dam to the Murray mouth in South Australia[7]. The timing and delivery of environmental water depend on the prevailing conditions throughout the water year.[8]

Environmental water delivered to the Murray River during 2013-14 has helped to improve the condition of the system[9]. However, there are a number of issues and risks that need to be addressed:

[7] http://www.mdba.gov.au/what-we-do/environmental-water/environmental-watering-priorities/priorities-14-15
[8] *ibid*
[9] *ibid*

- Environmental flows have the potential to increase flooding in certain areas, including those inundated at flood levels that were previously infrequently inundated due to regulation and water management practices (e.g. 1:3, 1:10 year events). This has significant potential to increase flood risk not only existing properties, but also those that may be rezoned in the future. This is particularly relevant given the lack of knowledge of most councils about the flood patterns at an LGA-wide scale and reliance on site-by-site assessments.
- There is currently limited understanding amongst some affected parties as to the process for delivery and managing the impacts of environmental watering events (relative to other sources of water). This process will be clarified in the MDB Plan "Constraints Management Strategy" expected in mid-2016.
- The environmental risks of the water program are associated with poor implementation of the watering plan. This risk is considered low, as the program is overseen by the Commonwealth Water Holder and River operators and implemented by specialised agencies / groups.
- There is an administrative risk of the water program, in that it must be implemented under the *Water Act 2007*. NSW has obligations under this legislation to implement the Basin Plan, and therefore the administrative risk is also considered low.
- There is the perception that environmental watering is creating problems for local tourism due to flooding of infrastructure and lack of water availability at key times of year (for example peak tourist seasons). The real magnitude and impact of these risks and needs to be ascertained.
- The risk to assets from flooding due to environmental watering depends on the location of those assets and the year-on-year watering regime. The MDBA has recognised this risk and is putting measures in place to address it (e.g. considerations of buy-back, flood easements, compensation).

The Murray Darling Basin Authority is responsible for the Basin-wide environmental watering strategy, which is reviewed at least every five years in consultation with stakeholders. As part of this review, it is suggested that the MDBA address how the above issues, resulting from increased environmental watering can be managed in future instances.

3.10 Tourism and recreation

3.10.1 Tourism

Tourism is one of the key industries underpinning the Riverina-Murray Region's economic base and is a driver of local economies.[10] Most of the region's tourism is based around natural assets and recreational opportunities such as the Murray River. As a result the majority of tourist infrastructure is concentrated along the river system.[11] Tourists generally have significant expectations about how they will be able to use and interact with the river as part of a tourism experience.

Existing planning controls

Tourism and recreational activities on water are subtly controlled with application of Zone W2 Recreational Waterways adjacent to urban development zones. GIS analysis of LEP zoning layers indicates a negligible amount of land directly fronting the river is zoned specifically for tourism uses (SP3 Tourism Zone~0.6km). Approximately one quarter of the length of the river is zoned E1-3 (environmental zones) and RE1 (public recreation).

[10] Background discussion paper on MMRGP – Economy (DP&E 2014)

[11] Background discussion paper on MMRGP – Economy (DP&E 2014)

Generally, councils receive few DAs for large scale tourism facilities such as caravan parks, with more DAs received for ancillary tourism infrastructure such as boat ramps, mooring, pontoons, etc. For example, Wakool Shire Council receives ~12 mooring DAs per year, but very few other tourism-related DAs. This indicates the need for a review of the approvals processes and mechanisms for assessing and approving ancillary tourism infrastructure rather than considering this as a sector based issue.

Tourism Management Plans

The Murray Regional Tourism Board prepared a *Destination Management Plan* in 2012 which identified the Murray River as a key tourism opportunity, and detailed a series of projects aimed at improving the tourist experience along the river. In addition to this, larger councils also have resources to develop local tourism strategies and experiences e.g. Albury City Council envisage a tourist trail that will extend from the Wonga Wetlands up to the Hume Dam (some portions are already built, with a Tourism Product Development Masterplan developed to support increased tourist visitation).

Tourism Tensions and pressures

Declining health and amenity of the Murray River is a key risk to the tourism industry. A healthy and functioning river is what attracts people to the region. There is a risk that the pressure on the river relating to visitation and use becomes so great that the drawcard values are diminished i.e. the river is 'loved to death'. Tourism pressure is highest over the summer peak season and during large events e.g. Wentworth ski event in November.

The perception of some State agencies is that tourism and recreation has a larger impact on the river than urban development. This considers both the impacts of the infrastructure associated with activities e.g. retaining walls, pontoons, posts and piling, ancillary structures for boat use, and the high intensity activities and uses e.g. boating and skiing activities on the river. The activities and infrastructure can negatively impact environmental values, bank stability, amenity and access. There is also potential for the cumulative effects as these impacts can compound with increasing development intensity over space and time.

Water availability and river heights are highly variable in upstream areas around Albury, Corowa and Greater Hume LGAs, due to irrigation system demands and the regulated flows required to meet these demands. There are negative consequences for tourism when the irrigation season finishes before key tourist periods (e.g. late Easter), as low irrigation demand means low flows and water levels which reduces recreational opportunities and visual amenity on the river.

Flooding can damage river based tourism infrastructure, much of which is council developed and owned. This means the cost of damage will ultimately be borne by the community as rate payers. There is also a perceived issue with increasing environmental flow releases causing increased frequency and duration of flooding and therefore increasing the potential maintenance and repair bill.

3.10.2 Boating and moorings

Boating is one of the key recreational and tourism uses along the Murray River. In the Riverina-Murray Region, boating activities include water skiing, wake boarding, house-boating, fishing and kayaking/canoeing[12]. There are approximately 45,000 NSW boat licences in the Riverina-Murray

[12] Regional Boating Plan Murray Riverina Region (Transport for NSW, 2015)

Region (representing 8.2% of licences in NSW). Given a large majority of residents and visitors in this region are from Victoria the estimates of recreational boat users indicated by NSW Boat Licence holders in the region will be a considerable underestimate of the total number of boat users operating on the river[13].

Risks and pressures

Boating creates a demand for ancillary infrastructure including mooring, marinas, jetties, boat ramps and pontoons (consistent with the frequency of DAs received by councils). The lack of strategic planning for boating infrastructure and river use poses risks to the environmental values of the river, user safety, enjoyment, amenity and access. This is particularly reflected in high use/demand areas such as Moama and Wentworth, where the unplanned nature of infrastructure has made the location and number of moorings difficult to determine the risks and pressures associated with this include:

- Risks are significantly greater in the areas of high usage and during peak times.
- River use for boating is seasonal with peak in summer and during organised events.
- Types of pressures are regionally different, with the highest boating use occurring in Deniliquin Council, and Wentworth and Murray Shire Councils.
- Mooring and boating issues occur at different scales of intensity along the river.
- Mooring pressure is highest in Moama-Echuca and Mildura-Wentworth which reflects usage patterns on the river.
- Perceived increase in bank erosion from wash, however there is no definitive science for this.
- Tension between aquatic habitat protection/restoration (e.g. re-snagging programs) and river user safety.
- Increased urban development along certain stretches of the River result in proliferation of in-water structures (e.g. moorings, jetties, pontoons). This increases cumulative effects of disturbance to bank/bed, reduced amenity, navigational/safety issues.
- No strategic marina policy in NSW to guide location, capacity and facilities of marinas (guidance for appropriately locating marinas at a local scale is provided in the EIS Guidelines Marinas and Related Facilities).
- Wake boarding and water skiing are big tourism drawcards in Deniliquin Council, and Wentworth and Murray Shire Councils. User conflict between those wanting passive recreation experience (e.g. kayaking, fishing) and those wanting active recreational experience (e.g. wake boarders, water skiers). Local councils receive complaints.
- The lack of planning, coupled with high demand increases the risk of moorings being sited inappropriately, waterway congestion and lack of opportunity for strategic siting of support infrastructure e.g. pump out facilities.

Existing planning controls and regulation

A two-step approval process applies to moorings located along the Murray River involving a licence from the Roads and Maritime Services (RMS) and a DA from Council, which is required to be referred to other state agencies under the MREP2. It is noted that in other areas of NSW a RMS licence is the sole requirement, reducing associated approval and processing times and application costs.

The current system under the MREP2 prevents the RMS from having a priority wait list for moorings in areas of high demand (e.g. Moama). This system is in place elsewhere in NSW (e.g. Sydney Harbour)

[13] ibid

and under it, the RMS re-allocates mooring licences as they are relinquished (there is also the ability to 'retire' moorings). This prevents trade in mooring licences and profiteering, such as that experienced in Murray Shire where licences are being sold for up to $200,000. It also allows the RMS to better regulate the number and location of moorings.

Mildura has a mooring management plan and priority wait list, however the biggest issues are associated with moorings around Moama-Echuca due to high demand and narrowness of the river. Wentworth-Mildura also experiences high demand for moorings however a wider river and generally better managed process, lessens the magnitude of the issue. The RMS is currently undertaking a review of moorings in NSW and the Maritime Management Centre (Transport NSW) is currently developing Boating Plan for the Murray-Riverina (and elsewhere) to address issues such as access, storage, infrastructure and safety (currently draft, final due in November).

Management and approvals for moorings on the Victorian bank of the Murray are complicated because they apply to boats in the river (NSW), but structures and land access in Victoria. This was a common issue for several councils, prompting some to develop local models for dealing with the complexities such as Wentworth. Whilst this provides a workable solution for individual councils it is not a process which can be systemically implemented across councils. The requirement for approval from Victorian agencies can also lead to significant delays, for example an application in Balranald Shire took two years for processing and approval.

There are also definitional issues in LEPs with the terms 'boat shed' and 'mooring'. In zones where moorings are not permitted but boat sheds are (e.g. RU1 in Wakool Shire), DAs are being lodged (and approved) for boat sheds, which in actual fact are moorings (boat sheds are defined as 'structure used for the storage and routine maintenance of a boat').

In contrast to the unnecessary duplication of approvals for moorings, approval for structures in the river e.g. wharves and pontoons, require a DA to be referred to the RMS. This ensures navigational advice is correct and appropriately considered.

Some agencies have reported tensions between an applicant's proposal, what is acceptable to local councils and what is permissible by state agencies in terms of in-river developments. This tension has led to confusion and frustration, as well as delays and increased DA costs. Draft development standards have been collectively drafted by state agencies (in 2009), refining and completing these may resolve some of these issues (see section 4.1.3 for further discussion).

3.11 Constraints to funding and capacity

There are limited resources available at all levels of government, both in terms of funding and the capacity to develop policies/plans and implement programs. Resources to assess development applications are also often stretched, particularly when there are multiple assessment agencies. At a local council level funds are limited by the size of the rating base and whatever supplementary funds may be obtained through state or federal government initiatives. In local governments with a small rate base (i.e. population) the ability to generate adequate funds is a critical issue.

State Government funding is limited, but currently available through:

- environment grants (also commonwealth funding available)
- boating and fishing licence obligations to return moneys collected to user facilities
- NSW Government for the development of floodplain risk management plans.

Many of the programs/procedures in place along the Murray River are multi-jurisdictional and require the cooperation of multiple agencies to effectively deliver outcomes. This increases the complexity and therefore the time taken to deliver outcomes. Councils also express the concern that policy and tools developed at a state level are often imposed on them, without adequate consideration, consultation or support. The tension with state government is complicated by the fact that councils are often reliant on the support of state agencies to deliver works and projects.

There are also limited resources for undertaking compliance and enforcement. Feedback received from some councils indicates only a very limited number of compliance checks were undertaken due to resourcing constraints. For example, the resources of the RMS for enforcement of boating rules (e.g. speed limits, safety equipment compliance) are stretched, with only three boating officers for the entire river.

Constraints to funding, resources and capacity-building are an on-going problem made worse as additional responsibilities/expectations are placed on local government without commensurate resources and support. The key risk from a lack of resourcing is that policy/programs are either not implemented or implemented poorly. Combined with limited capacity for compliance and enforcement the result is that the outcome of the policy/program is not delivered.

4 Options

This chapter presents options to address some of the issues confronting the Murray River, and seeks to address gaps and inadequacies in current planning processes. The options have been identified in consultation with agencies and councils. They include:

- streamlining development processes
- land use zoning
- management plans and strategies
- setbacks and buffers
- water resource planning
- community engagement and information
- funding and resources.

4.1 Planning principles and analysis criteria

The options in this chapter have been analysed according to widely accepted planning principles and criteria. To ensure planning controls contribute to making urban development along the Murray River economically, ecologically and socially sustainable, the following principles have been applied:

- Government planning and decision-making needs to be consistent and transparent.
- Improvements to the current planning processes need to be incremental, practical, cost-effective to implement and have majority community support.
- Development should have a net or beneficial effect (NorBE) on the environment, or improve or maintain environmental conditions.
- The environmental consideration of the whole river system should be prioritised over individual property rights. The Murray River waterway and much of the foreshore is a public resource and so further alienation or obstruction of this resource by or for private purposes is not supported.

The draft Riverina-Murray Regional Plan has the opportunity to outline the standard by which all planning decisions along the River Murray should be made, whether that is to utilise a s117 Direction or suitable instrument in the new planning regime. The following criteria are suggested to support this process:

(1) Principal LEPs and Part 5 determinations shall be prepared taking account of the following:
- *(a) The River Murray system as a significant economic, natural and cultural asset.*
- *(b) Development must minimise adverse impacts on the attributes and values of the riverine environment, including habitats and biodiversity, water quality and quantity, river system health and integrity, and scenic/landscape quality and amenity.*
- *(c) Development should protect and maintain the Region's significant economic and cultural assets, including agriculture, tourism and cultural heritage.*
- *(d) Future urban development is to be located to reinforce the role of existing settlements and in particular infrastructure, services and facilities provided in existing centres.*

Specifically these criteria need on-ground environmental protection thresholds for biodiversity, air quality, heritage and waterway health. Specific development measures are required such as:

- Protect riverine corridors and sensitive waterways as outlined in LEP provisions and overlays.
- Avoid additional risk in new developments on flood prone lands.
- Maintain or improve areas of regionally significant terrestrial and aquatic biodiversity (as mapped and agreed by the OEH). This includes regionally significant vegetation communities, critical habitat, threatened species, population, ecological communities and their habitats.
- Maintain or improve existing environmental condition for air quality.
- Maintain or improve existing environmental condition for water quality.

- Be consistent with the NSW Water Quality and River Flow Objectives prepared by the Office of Environment and Heritage
- Be consistent with catchment and storm water management planning (Local Land Services and Councils).
- Protect areas of Aboriginal cultural heritage value.
- Provide and facilitate public access to the river front in urban areas.

4.1.1 Concurrences and development standards

The NSW DPI - Water have previously drafted guidelines for complying structures on watercourses where planning consent from council and a permit prior to construction is required. The guidelines cover the following structures:

- boat ramps
- retaining walls
- moorings
- walkways and landings
- stairs on riverbanks.

The guidelines need to be agreed to and adopted by all NSW agencies and subsequently published in conjunction with a streamlined approval process. An amended version of the draft guideline controls is outlined below (additional development standards have been included):

Boat Ramps

Suggested development standards are:

1. *Preference for public boat ramps over private boat ramps. Within town centres, private boat ramps should not be permitted. The use of public boat ramps should be maximised.*
2. *Ramps are to be located on inside bends or on straight sections of a waterway. Boat ramps are not to be located on the outside bend of the river.*
3. *Natural slopes are to be used as opposed to deep excavations so as to minimise erosion impacts.*
4. *The ramp is to be at an angle greater than 90 degrees to the downstream flow. This will allow water to back into the ramp during high flows rather than flowing up the ramp at high velocities.*
5. *The ramp is to be tied into the bed and bank of the river to ensure minimal undercutting. This should be done by the use of a concrete apron into the bed and wing walls / aprons into the bank.*
6. *The ramp does not have an excavation depth greater than 2 metres.*
7. *All drainage should be directed to low flow water level by either a pipe or lined channel.*
8. *There is to be no native vegetation (including trees, shrubs, ground covers etc.) disturbance.*
9. *There is to be no impact of Aboriginal cultural heritage.*
10. *Appropriate measures to prevent soil erosion and the entry of sediments into the adjacent waterway must be undertaken.*
11. *No heavy machinery is to enter the River pre, during or post construction.*
12. *Operations are to be conducted in such a way that there is no diversion of the stream from the existing alignment.*
13. *Operations shall be conducted in such a manner as not to cause damage or increase erosion of the adjacent banks.*

A simplified illustration of the outer bend is shown below in **Figure 11**.

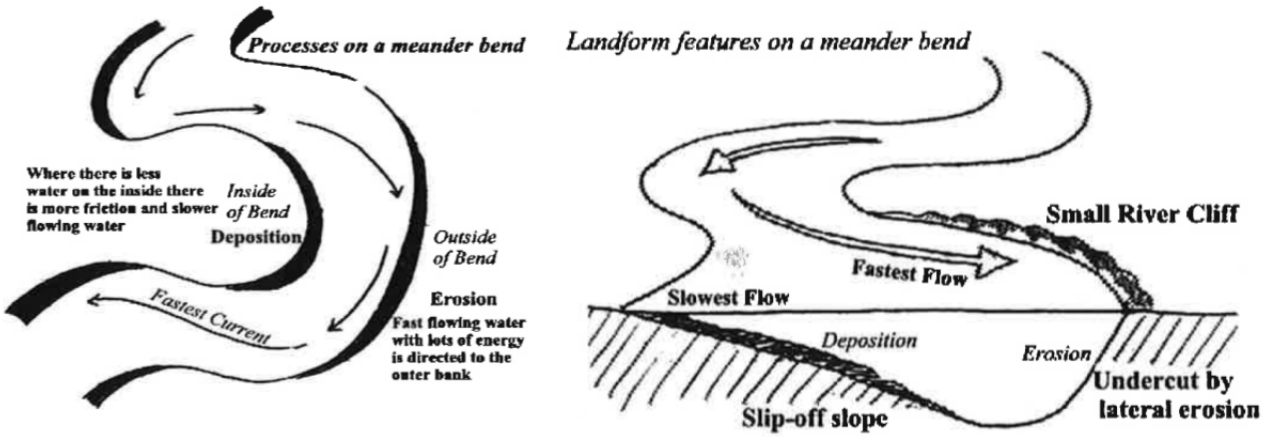


Figure 10: A simplified illustration of the outer bend

Retaining Walls on Waterways

Suggested development standards are:

1. *The wall is to be constructed no further than 500mm from the river bank.*
2. *'H' beams are to be excavated into the bed of the lake to a minimum depth of two times greater than the height of the wall.*
3. *Geotextile material is to be placed between the wall and the land so as water movement can occur freely but soil movement is hindered.*
4. *Clean fill is to be utilised between the wall and the land. There is to be no urban rubble or litter in the fill.*
5. *The wall is to be adequately tied into existing banks at a stable point or to adjacent works to prevent any under or back cutting from occurring.*
6. *The bottom panel of the wall is to be sunk into the bed of the lake so as undercutting is minimised.*
7. *An engineering certificate is to be provided if the wall is to exceed one metre in height (so as to confirm structural stability).*
8. *No natural drainage lines are to be altered.*
9. *No native vegetation (including trees, shrubs, ground covers etc.) is to be impacted.*
10. *There is to be no impact on Aboriginal cultural heritage.*
11. *Seepage from the immediate surrounding area is to be conveyed by pipe or lined channel to low water level and not be discharged above this level.*
12. *Any batters are to be constructed to a suitable grade (slopes should not be greater than 1 vertical to 3 horizontal). These batters are to be stabilised with suitable vegetation.*
13. *All works shall be undertaken with adequate measures to prevent soil erosion and the entry of sediments into the adjacent waterway.*
14. *No heavy machinery is to enter the River pre, during or post construction.*
15. *Operations shall be conducted in such a manner as not to cause damage or increase erosion of the adjacent banks.*
16. *Use of construction materials such as timber are preferred over alternatives such as concrete. The use of natural materials has less environmental impact.*

Moorings

Suggested development standards are:

1. *No more than one mooring per privately held title.*
2. *Compliant moorings are to occur in deep water or weir pools only.*

3. *The mooring is to be constructed at a stable point in the river i.e. at a site not prone to erosion.*
4. *Moorings are not to be located on actively eroding bends.*
5. *All works shall be undertaken with adequate measures to prevent soil erosion and the entry of sediments into the adjacent waterway.*
6. *There is to be no impact of Aboriginal cultural heritage.*
7. *No heavy machinery is to enter the River pre, during or post construction.*
8. *Operations are to be conducted in such a way that there is no diversion of the stream from the existing alignment.*
9. *Operations shall be conducted in such a manner as not to cause damage or increase erosion of the adjacent banks.*

Walkways/Landings

Suggested development standards are:

1. *Walkways and landings are to be hinged to the high bank of the waterway and floating so they can rise and fall with the water levels contained by the banks of the River and without creating erosion to the banks.*
2. *No natural drainage lines are to be altered.*
3. *No native vegetation (including trees, shrubs, ground covers etc.) is to be impacted.*
4. *There is be no impact on Aboriginal cultural heritage.*
5. *All works shall be undertaken with adequate measures to prevent soil erosion and the entry of sediments into the adjacent waterway.*
6. *No heavy machinery is to enter the River pre, during or post construction.*
7. *Operations shall be conducted in such a manner as not to cause damage or increase erosion of the adjacent banks.*

Stairs on river banks

Suggested development standards are:

1. *Stairs should not be cut into the bank.*
2. *Stairs should be fixed to the bank with minimal bank disturbance*
3. *No natural drainage lines are to be altered.*
4. *No native vegetation (including trees, shrubs, ground covers etc.) is to be impacted.*
5. *There is to be no impact on Aboriginal cultural heritage.*
6. *All works shall be undertaken with appropriate measures to prevent soil erosion and the entry of sediments into the adjacent waterway.*
7. *No heavy machinery is to enter the River pre, during or post construction.*
8. *Operations shall be conducted in such a manner as not to cause damage or increase erosion of the adjacent banks.*

In addition to these draft guidelines, consultation with agencies and councils has also highlighted that routine works on the bed and banks and within the setback areas could be included as complying development in the Codes SEPP 2008. Such an approach would need to be coupled with an overarching plan identifying where public recreational infrastructure is to be located along the Murray River. Such a plan would inform the specific development types which could be considered as complying development. This approach would build upon the existing exemptions for controlled activities under the WM Act and could extend to moorings. Further, the ISEPP provides an alternative approval pathway if Council are doing the works (depending on the scale).

Reviewing the existing provisions contained in the MREP2 could provide the opportunity to remove duplicative or unnecessary referrals, by placing requirements into other existing legislative frameworks. The following table (**Table 7**) provides an overview of existing legislation and the type of approvals issued under the applicable Act.

Table 7: Agency Approvals

Agency	Applicable Act	Type of Approval (existing provisions)
DPI Water	WM Act	Controlled activities approval within 40m of waterfront land
DP&E	State Environmental Planning Policy (Infrastructure) 2007	Flood mitigation works and waterway and foreshore management activities
DP&E	SEPP (Codes 2008)	Exempt or complying development (that is not located to land in a riverfront area as defined by an LEP)
DPI Fisheries	Fisheries Management Act 1994	Applies to works within rivers or waterbodies that might affect fish habitat or threatened species
OEH	National Parks and Wildlife Act 1974	For the assessment of impacts on Aboriginal cultural heritage values
OEH	Threatened Species Conservation Act 1995	Impacts on threatened species, populations or ecological communities (generally not including fish)
EPA	Protection of the Environment Operations Act 1997	Licensing of water pollution

While consultation and referral requirements are important, any future review of the MREP2, should seek to streamline all consultation and referral requirements to increase clarity and reduce unnecessary referrals. Where appropriate, consultation requirements should be retained. For example, the OEH has expressed interest in retaining consultation with them regarding developments that clear vegetation and disturb the bank (for potential issues associated with threatened species and Aboriginal Cultural Heritage). The OEH uses this as an opportunity, in addition to their concurrence role under the *National Parks and Wildlife Act 1974,* to reinforce councils responsibilities. During any review of the MREP2 it should be investigated if other more appropriate avenues exist for such means i.e. other mediums or ways in which agencies can enforce or track council compliance with legal responsibilities.

Improved efficiency in the planning system by removing duplicative or unnecessary referrals and concurrences may also be achieved through expanding complying development provisions. Moving third party referrals and concurrences (e.g. OEH, Fisheries, EPA) from DAs or complying development is possible.

One option is to keep the integrated development provisions of the EP&A Act (s91) but provide guidelines to proponents/applicants for triggers under the:

- *Fisheries Management Act 1994* (for works within rivers or waterbodies that might affect fish habitat or threatened species)
- *National Parks and Wildlife Act 1974* (for impacts on Aboriginal cultural heritage values)
- *Threatened Species Conservation Act 1995 (for impacts on threatened species, populations or ecological communities)*
- *Protection of the Environment Operations Act 1997* (for licencing of water pollution)
- *WM Act* (for controlled activities within 40m of a waterfront land).

Specifically the consultation undertaken to date, highlighted the potential for NSW Agencies to develop model development standards for:

- boat ramps, moorings and jetties
- retaining walls and steps and stairs (down the riverbank)
- pump houses (for stock and domestic supply and irrigators).

These development types have been highlighted as they are typically uniform in construction approach material and purpose. These development standards can be applied to each river type (e.g. designated ski area, natural, lock and weir, lake or irrigation channel). Section 1.19(e) of the SEPP (Exempt and Complying Development) may not be available for such works because of their integrated nature, however councils and agencies can refer to an agreed standard that would streamline the process.

NSW Fisheries is reluctant to include boat ramps and retaining walls as exempt or complying development types, unless there are stringent regulations and upfront/strategic identification of suitable sites prior to their inclusion as development types. There is the potential to investigate the application of standard development requirements and consent conditions (see Section 3.4 of this report). Additionally there is a risk of proliferation of private infrastructure with every house in a ribbon development with river frontage wanting a jetty. Contrary to this there has been a recent example where a grouped application for one shared jetty was received from five owners in Wentworth in a bid to be more cost effective.

Any proposed development standard would need 'whole of government' endorsement and include a threshold on application numbers.

4.1.2 Infill development

As discussed in Section 3.3, the DP&E will consider the development of new dwelling houses consistent with setback provisions established by previous development on immediately adjoining properties with existing dwellings located upon them. However, any variation to the prescribed setback distance for this purpose still requires discussion and agreement with the Department's regional office following Council consultation with the OEH and DPI Water, and any other required state agencies.

If adopting changes to each LEP clause for infill development, it is recommended that within existing R1 zones affected by the 40m standard setbacks, the existing building line be used as a 'default setback'. In this scenario, the existing SI LEPs clause would need to be amended. The following subclause could be added to clause (2) of the SI LEP model clause for river front development:

> *2) Despite any other provision of this Plan, development may only be carried out, with development consent, on the land in the river front area for the following purposes:*
>
> *(f) Development of a new dwelling within an existing R1 zone (prior to this clause) provided they are located no closer to the river bank than the building line established by the adjacent existing dwellings.*

The definition of 'infill' will need to be unambiguous to remove scope for inappropriate and unintended development. Whilst scope for construction of new residential dwellings in 'infill' situations is limited, (refer discussion Sect. 2.8), the extent to which the extension of existing dwellings as urban infill may add to cumulative impact issues in the riparian zone has not been quantified.

It is recommended that the term 'infill development' be defined in all SI LEPs. An option for a clearly worded definition of 'is already used by the Rural Fire Service and provided below:

> *Development of land by the erection of or addition to a building (or buildings) which does not require the spatial extension of services including public roads, electricity, water or sewerage and is within an existing allotment in a residential area.*[14]

4.1.3 Exempt and complying development

A review of the Codes SEPP (2008) should be undertaken to include additional development types such as pump houses, boat ramps and pontoons as exempt development. Consultation with State agencies including DPI Water, Fisheries and Office of Environment and Heritage should occur to determine appropriate development standards for exempt developments. As a central part of this process, a definition for the term 'minor' needs to be established by the DP&E's Policy Team. This definition should be included across the planning instruments, including local environmental plans, which reference this term.

Pending the outcome of the Codes SEPP 2008 review, it is recommended that standard conditions of consent be developed for complying development types (under the General Housing Code and Rural Housing Code) identified in a riverfront area, where practicable and appropriate, for example ancillary development (swimming pools, fences) and outbuildings.

Should the amendment to the Codes SEPP 2008 result in controls which only prohibit the construction of complying development on the part of the land affected by the exemption, not the whole parcel, there would be no need to develop additional standard conditions of consent. Both of these outcomes are likely to increase the amount of permissible complying development along the river without interfering with established riparian buffers and setbacks.

4.1.4 Multi-jurisdictional planning for in-water structures

There is a need to streamline and make consistent the development application/assessment process for in-water structures, particularly moorings, which currently requires consent from Victoria. There are several options that specifically relate to moorings and other in-water structures.

The proposed repeal of the MREP2 will assist in this regard by removing the need to refer DAs to Victorian agencies, where the activities are to be undertaken solely in NSW. However, moorings or other infrastructure that is anchored to the Victorian riverbank and extends into the river (i.e. NSW) requires approval from authorities in both states.

There are currently negotiated informal processes for streamlining assessments in operation in at least two NSW LGAs and their corresponding cross-border LGAs in (Wentworth with Mildura, Wakool with Swan Hill and Gannawarra).

There are a number of models that may be appropriate and will require further investigation, including consultation with local and state agencies in NSW and Victoria. Any potential legal ramifications would need to be determined as part of this negotiation. In order of preference the options are:

[14] RRS website: http://www.rfs.nsw.gov.au/plan-and-prepare/building-in-a-bush-fire-area/planning-for-bush-fire-protection/dictionary-terminology

1. Accreditation of respective (existing) state processes to assess and approve the component of the DA that is in the other state's jurisdiction e.g. a NSW Council would assess and approve the whole DA for a mooring tied to the Victorian bank under a process that is accredited by Victoria. This is similar in principle to the bilateral agreement process under the EPBC Act.
2. Separate assessment and approval of whole the DA by both NSW and Victorian agencies with the same approval decision and conditions. This would require mutual review, negotiation and agreement on approval decision and conditions by both states' agencies. A process for resolution of conflicting views/requirements would need to be developed.
3. Development of a specific (new) process for assessing moorings and in-water DAs that is agreed to by both states.
4. Negotiated local agreements between adjacent cross-border Councils as to how moorings and in-water DAs should be assessed. It is recommended there also be a process for review and endorsement by relevant state agencies to ensure planning and assessment requirements are being upheld.

Development of moorings is permitted with consent (in certain zones) in all LGAs along the Murray River and a licence from the RMS is also required. In some other jurisdictions across the state, only a licence from the RMS is required. Adopting a single RMS authority licensing arrangement for the development of moorings, (as is available in some areas of NSW- refer Sect.2.14.2, pp 44) model in the Murray LGAs would significantly reduce the cost, time and complexity of mooring DAs and would reduce the workload of Council staff, particularly in high boating-use locations.

Definitional loop-holes in LEPs are allowing mooring DAs to be approved in zones where they are not permitted. This loop-hole should be closed by ensuring a mooring cannot be defined as a 'structure used for the storage and routine maintenance of a boat', under the definition of a 'boat shed'. This will require the redrafting of definitions by Parliamentary Counsel, but could be as simple as adding "*but is not a mooring*" to the end of the definition of boat shed, for example:

> ***boat shed*** means a building or other structure used for the storage and routine maintenance of a boat or boats and that is associated with a private dwelling or non-profit organisation, and includes any skid used in connection with the building or other structure, but is not a mooring.

4.2 Land use zoning

4.2.1 Cumulative strategic assessment

Defining the location, extent and intensity of development and recreational activity on this already stressed river system has not been done as a systematic exercise for the whole river. The establishment of environmental thresholds for location, extent and intensity of urban development (as well as agricultural, industrial development and other land uses) would be a useful management tool in an overarching planning or strategy document such as the Regional Plan. These thresholds could then be considered in planning proposals, particularly rezonings. The onus could then be placed on the applicant to demonstrate how their proposal will be accommodated within the established environmental thresholds. This approach would enable the appropriate consideration of both singular and cumulative impacts of development.

4.2.2 Development on the floodplain

There are numerous reasons to support a position that future residential development on the floodplain should be prohibited. The planning system has the mechanisms to achieve planning outcomes through orderly rezoning whilst avoiding undue flood risk. The previous provisions of MREP2 need to be reaffirmed as they are clear in stating:

> *Where land is subject to inundation by floodwater, the following are to be considered:*
> *(a) the benefits to riverine ecosystems of periodic flooding*
> *(b) the hazard risks involved in developing that land*
> *(c) the redistributive effect of the proposed development on floodwater*
> *(d) the availability of other suitable land in the locality not liable to flooding*
> *(e) the availability of flood free access for essential facilities and services*
> *(f) the pollution threat represented by any development in the event of a flood*
> *(g) the cumulative effect of the proposed development on the behaviour of floodwater*
> *(h) the cost of providing emergency services and replacing infrastructure in the event of a flood.*

As such the development of FRMPs (see **Section 4.3.2**) is a high priority in order to provide robust supporting information for the existing s117 direction and the existing MREP2 guidance. Along the Murray River the ad hoc application of FRMPs and local decision making has increased the number of dwellings at risk of flood and placed a strain on emergency and insurance funding. The Regional Plan needs to be unequivocal in stating that new urban releases in high flood hazard areas and designated waterways are prohibited unless consistent with an adopted FRMP endorsed by OEH and DPI Water. The FRMP should be at a scale commensurate to the subject proposed rezoning site including the whole development area and any connected waterway, and including consideration of the cumulative impact of development on the floodplain.

A whole of government position should include that future residential planning proposals will not be supported or approved if land is identified as flood prone or if there is no FRMP for the proposed development area.

4.2.3 Overlays

Greater guidance is needed for councils on the use and/or implications of overlays. State agencies (DPI Fisheries and OEH, in particular) find the overlays very useful as a planning and development assessment tool. Consultation during this study revealed that some councils (both staff and Councillors) did not endorse the use of overlays. This opposition was a result of two main factors:

1. misunderstanding of the implications of overlays i.e. a view that if an area was encompassed within an overlay then development was prohibited
2. local-scale inaccuracies in mapping creating uncertainty and undermining the credibility of information in the whole overlay.

Addressing these issues should be reasonably straightforward. Misconception about the use of overlays requires further engagement, education and training. The DP&E in conjunction with other key agencies such as the OEH and DPI Fisheries, need to be working with Councils to explain the overlays, their value, their limitations how they were developed and how/why they should be used. These overlays then need to be enforced by planning controls.

Engagement with Council on overlays should extend to addressing the accuracy of information included in the mapping overlay. A large amount of work and consideration has been put into the development of overlays, but due regional scale of mapping, some local scale inaccuracies are inevitable. This should be explained to Councils, along with their options for managing the inaccuracies. Given that overlays are considerations clauses (not prohibitions) Councils can clearly take account of local inaccuracies in their assessment processes. If identified (and appropriately ground-truthed) early in the process, Councils should be able to provide applications with the advice that the overlay does not need to be considered in this particular instance. Ground-truthing and updates of overlay data would assist if resources and priorities allow.

4.3 Waterfront Management Planning

Developing robust strategies and plans to manage the waterfront is essential. It is recommended that the DP&E develop a waterfront management plan, similar to that required for 'controlled activity' approvals under the WM Act. This would be a comprehensive, multi-agency strategy which investigates the range of waterfront planning and zoning issues, uses and agreed responses and planning outcomes for management of the Murray River. This strategy should also highlight opportunities and management pressures associated with tourism and recreation.

4.3.1 Waterfront Management Plan

Where councils require amendments to the setback provisions and WM Act 'controlled activity' approvals, it is recommended that a waterfront management strategy be developed to dovetail into the above, River long 'whole of government' vision. This regulatory mechanism under the WM Act (see *Water Management (General) Amendment (Controlled Activity Approval Exemption) Regulation 2009*) has the ability to coordinate the objectives of the WM Act and EP&A Act.

Such a plan has the flexibility to look at the tourist, urban and settlement (rural residential) interfaces within the riverfront land areas and adjust planning approval mechanisms. The purpose of the strategy is to set the controls and outcomes for controlled activities occurring on waterfront land. Such changes are permissible under s39A of the *Water Management (General) Regulation 2004*. Any waterfront management strategy should aim to:

- allow exempt and complying development or development standards where appropriate
- protect existing native remnant buffers
- identify areas for meandering outer bends
- establish an ongoing funding mechanism
- integrate with future tourism and recreational strategies.

Currently this option also exists in the model provisions in the MREP2, however it does not remove the controlled activity requirements. The waterfront management strategy provides a regulatory mechanism to achieve both the outcomes and streamlined development process for larger scale landuse changes.

4.3.2 Floodplain risk management plans

The vast majority of planning and development-related issues surrounding flooding can be addressed via the development of FRMP for Councils along the Murray River. As indicated in the Floodplain Development Manual, FRMPs can eliminate the ad hoc decision making which has contributed to many present day flooding problems. A comprehensive waterfront management strategy should seek to further highlight the development-related issues regarding flooding and development on flood prone land.

Councils have the primary responsibility for developing and implementing FRMPs, however, there is considerable support available from state government agencies. Floodplain management grants are

administered by OEH and assistance provided under the program is usually at a 2:1 state to local government ratio. Funding applications can be made for both the development of FRMPs (including precursor flood studies) and the implementation of actions arising from these plans. Technical support and advice is available from a range of agencies during the development of plans.

In developing and implementing FRMPs, Councils will be able to do the following, thereby addressing a large number of the issues identified in this report:

- Understand the flood behaviour of the Murray River in their local area and clearly identify where flood prone lands are located.
- Strategically assess the location of future development (including both within current zones and re-zonings) with respect to flood risk.
- Use the outcomes of the plan to strengthen application of flood protection clauses in LEPs, and ensure there are adequate controls for development within the current flood zone i.e. is the 50 cm freeboard high enough.
- Remove the need for private or site specific flood plans to be prepared for individual developments.
- Ensure there is adequate protection and maintenance of existing levees, and determine the necessity for new flood protection structures/works.
- Ensure the local area has appropriate flood response mechanisms in place (e.g. emergency services, asset protection) that are aligned with local, state and federal government policy and advice (i.e. outcomes and recommendations of recent disaster response reviews).
- Identify areas where environmental flows will increase flood risk to assets and develop appropriate management responses.
- Developing FRMPs is consistent with NSW Flood Prone Land Policy It is also consistent with the outcomes and recommendations of recent strategies and reviews, which have analysed natural disaster responses, which include: *National Strategy for Disaster Resilience* - the risks disasters pose to communities are understood (mapped) and mitigated through appropriate land-use and strategic planning.
- *Building our Nation's Resilience to Natural Disasters* White Paper (Australian Business Roundtable for Disaster Resilience and Safer Communities 2013) - advocates for consistent frameworks for data collection and provision of regionally and locally relevant and accurate information, which is used for land use planning to promote effective pre-natural disaster resilience.
- *Review of the 2010–11 Flood Warnings and Response* (Victoria) (Comrie 2011) - recommended that enhanced and accessible flood mapping was updated to inform strategic planning and the community to ensure appropriate risk based decisions were taken.

Developing FRMPs also provides Councils with the mechanism and opportunity to engage with the MDBA to understand and incorporate environmental flows programs into flood studies and flood risk mapping. Whilst this step is not strictly included in the method for developing FRMPs in the Floodplain Development Manual, the future priorities around environmental watering programs provides an impetus to consider both ‘natural’ and ‘environmental’ watering related flood events.

The Victorian Flood Review (2010) recommended that the state establish standards for flood mapping to ensure they are kept contemporary and meet the purposes of landuse risk planning and emergency response. In doing so, maps should extend where appropriate to include Probable Maximum Flood, over a range of Annual Exceedance Probability levels and be explicitly linked to a stream gauge. OEH, DPI Water and the Commonwealth will work with DP&E to determine flood planning levels including

probable maximum floods and freeboards. Discussion around this activity has already commenced within OEH and with a focus on cross border Murray River issues.

4.3.3 Tourism and recreation strategy

Tourism and recreation should be considered and included in any waterfront management planning process as it is a key land use along the river, which generates significant economic activity for many local communities. Actively planning for many of the specific issues associated with tourism and recreational development and recreational use along the river will lead to greater community engagement in the planning process.

The primary aim of such a strategy would be to consolidate and locate tourism development and recreational activities in appropriate places along the River. Tourism and recreation should be considered as part of any waterfront management strategy, and should consider:

- Building on the existing Murray Destination Management Plan, local and regional plans, strategies and initiatives e.g. local water skiing events, Albury riverside tourist trail, Murray-Riverina Regional Boating Plan.
- Leveraging off the existing drawcards and facilities within the region e.g. boating in Murray and Wentworth Shires.
- Identifying areas of conflicting uses and develop measures to separate these, including providing incentives for consolidation of uses in specific areas (see example of ski zones below).
- Identifying appropriate areas for future tourism development considering zoning and re-zoning (differential and complementary between land and river), ribbon development, public access, amenity and flooding.

As part of a review of the existing tourism and recreation land uses and future opportunities, the waterfront management strategy should address:

- dedicated ski areas (hardstand) (see Section 4.3.4 below)
- dedicated passive zones with no moorings, speed restrictions
- community river side facilities
- linear trails
- house boat industry needs
- pump stations
- overnight moorings
- shopping (parking) supplies
- rubbish/waste disposal.

An appropriate planning setting for a tourism and recreation strategy may be as a supporting/subordinate plan to the Regional Plan.

4.3.4 Ski zones

Development of dedicated ski zones in certain areas of the Murray River (and other areas of the River Murray such as the Edward River) could be a key outcome of the tourism and recreation strategy. Alternatively, this could be a stand-alone initiative. There would be social benefit to these zones by providing appropriate infrastructure within and adjacent to the zones and minimising user conflict. This would be coupled with the environmental benefit of keeping impacts within a confined and manageable area and allowing protection and enhancement of aquatic habitats and bank stability in other areas.

Steps to developing dedicated ski zones could include:

- Identify areas suitable for use as a dedicated ski zone(s). Issues to consider would be current ski use and likely demand; availability of existing facilities (e.g. boat ramps); costs for any upgrades or environmental protection works, environmental values; erosion risk and river morphology; other users; safety and navigational hazards.
- Provide incentives for development and use of the dedicated ski zone. This could include accepting a trade-off between reducing environmental values (e.g. de-snagging) and providing improved user safety.
- Monitoring and research to determine if wakes are increasing erosion and if so, implement erosion control and prevention measures (e.g. retaining walls).
- Setting reduced speed limits up and downstream of ski zone to prevent skiing in adjacent areas. (this would require enforcement).

Consultation undertaken for this study revealed initial support for this concept among state agencies and council staff. It was suggested that a pilot ski zone be progressed to assess its effectiveness, both from an environmental and user perspective. The suggestion of dedicated ski zones also aligns with recommended 'action j' in the Regional Boating Plan Murray-Riverina Region (see Section 4.3.5).

4.3.5 Regional boating plan

Transport for NSW completed a Regional Boating Plan for the Murray-Riverina Region in 2015. This plan has highlighted many of the same issues and challenges that were raised during the consultation undertaken for this study. There are a number of actions and solutions proposed in this Plan that should be supported in a waterfront management strategy for the Riverina-Murray Region. These are listed below. Given that Transport for NSW developed the Regional Boating Plan, it would be logical for this agency to take the lead in implementing the actions listed below. Support from DP&E and councils would increase the likelihood of positive outcomes.

Recommended actions from the Regional Boating Plan Murray-Riverina Region that provide options for addressing issues identified in this report are (lettering corresponds to that in the Boating Plan):

e. *Work with councils and other agencies to improve the design and condition of existing boat ramps including car and trailer parking.*
f. Review opportunities to increase public tie-up areas in conjunction with providing amenities such as sewage pump-outs and toilets at strategic locations.
h. Work with councils, cross-border agencies and other partners to help deliver projects that support strategic growth in boat storage capacity in the region (i.e. moorings, marinas, private jetties).
j. Investigate opportunities across the State to partner with councils or other stakeholders to establish dedicated facilities, including the funding of appropriate infrastructure, where wake generating boating activity can be undertaken with minimal impact.

4.4 Setbacks and buffers

The approach to defining setback widths to protect people, property and the environment is based on a comprehensive review of existing legislation and policy, applicable literature and assessment of issues affecting the river. Setbacks have been proven to be an effective means to provide a balance between assisting to maintain river health and biodiversity objectives, whilst providing communities with river amenity and development opportunities for residential, tourist and recreation uses.

4.4.1 Determining river setbacks

The standard setback widths that currently apply to the Murray River apply only on the NSW bank of the river and are measured from a defined setback reference point (top of bank/ high bank point). The standard for the majority of the Murray River on the Victoria side is 60m. For other rivers within the

Region, setback widths apply to both sides of the bank and are measured using the same methodology for calculating the setback reference point.

The minimum standard setback widths that currently apply to riverfront areas in the Region are 40m for urban zones and 100m for rural zones. It is recommended that river setbacks should remain as follows:

- **Rural areas** - not less than 100 metres in all rural zones (Zones RU1, RU2, RU3, RU4, RU6)
- **Urban areas** - not less than 40 metres in urban zones (Zones R1, R2, R3, R4, R5 or RU5)

The reference point for calculating the start of a river setback is to be measured generally the top of bank/ high bank (break of slope from the river bank to surrounding land) of the waterway (See Section 3.2.4, Figures 3-7). A riverfront building line should be mapped and incorporated in local plans along all riverfront land, clearly showing the required setback for development within each local government area.

As discussed during consultation with agencies and councils, there is a level of inconsistency in determining what constitutes the 'high bank', with different methods being applied across the councils visited and interviewed as part of the consultation process for this study.

The provisions of the *WM Act* refer to the 'top of bank' to identify …"*the bed of any river, together with the land lying between the bed of the river and a line drawn parallel to, and the prescribed distance (40m) inland of, the highest bank of the river."* The Act method adopts a geomorphology or structural approach to defining waterfront land rather than a hydrological approach. The hydrological approach is not considered appropriate for inland rivers due to the high flow variability and increased potential for misinterpretation. On the Murray River, particularly on the floodplain, there can be multiple high banks, anabranches and/or oxbows etc. The DP&E adopts the definition of the "Murray River" as including the 'River Murray' to apply the provisions to all connected waterways.

Technology, such as LiDAR (which the MDBA have for the entire river) should be able to remove much of the conjecture regarding changes to 'top of bank' following high flow/flooding events e.g. on a migrating meandering outer bend. The consistency of this data requires further investigation. For parts of the river where weirs or other regulating structures have created an environment of very stable water levels, the historical geomorphic 'flood banks' and the associated definitions in the WM Act are not always considered the most appropriate.

As such, identification of the high bank is important as it forms the reference point which setbacks are then measured from. This provides a consistent approach in calculating a setback distance along the length of the river and allows for various geomorphological differences (which can affect the way a particular section of a river functions).

4.4.2 Variations to river setbacks in urban zones (Zones R1, R2, R3, R4, R5 or RU5)

In some circumstances river setbacks may be varied to facilitate infill development opportunities (see **Figure 11**). Variation to the standard minimum setback provisions should only be approved where the variation sought applies to a setback in an urban zone (Zones R1, R2, R3, R4, R5 or RU5) to facilitate infill development.

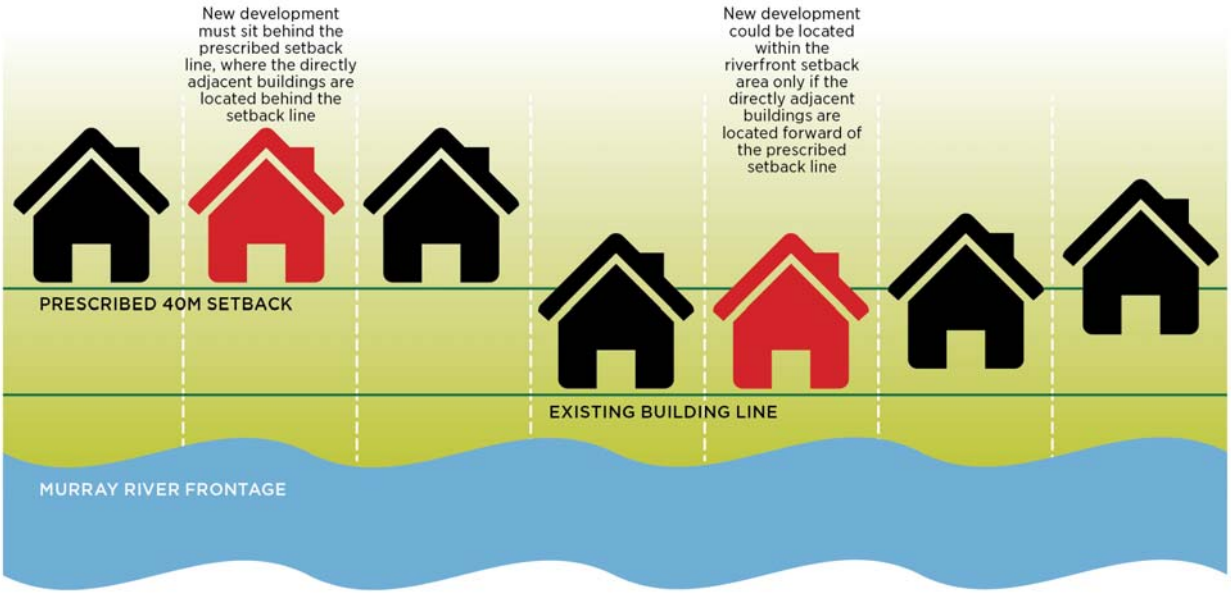


Figure 11: Example of setback variations for infill development

In considering a variation for infill development purposes, the following considerations should be mandatory:

- the immediately adjoining property setback distances – new developments are not to be located further forward than the existing neighbouring property setbacks.
- the building line of the immediately adjoining property (which may be located within the prescribed riverfront area). New developments are not to be located further forward of the existing building line of any neighbouring dwelling house.
- the location and appearance of structures – new structures should be compatible with the surrounding area;
- location of development – new development is not to be located on the outside of a river bend.
- adverse effects on the riverine environment, flora or fauna habitats and drainage or flow patterns – all effects as the result of new or altered development should be appropriately limited.

Currently, *Clause 4.6(8) Exceptions to Development Standards* does not expressly preclude variations to river setbacks. It is recommended that Clause 4.6(8) is amended by inserting reference to the relevant setback clause, to ensure that variations to setback clauses are prohibited, except to facilitate infill development opportunities. In addition, it is recommended that the standard model setback clause be amended to expressly permit, with consent, variation of the prescribed setback distance to facilitate infill development.

4.4.3 Variations to river setbacks in rural zones (Zones RU1, RU2, RU3, RU4, RU6)

In rural areas, unless otherwise mapped in Council's LEP, the 100m setback applies and should not be varied. Variations to riverfront setbacks in a rural zone can still be approved by the Department but only where adequate justification is provided to the DP&E, with support from the OEH and DPI Water. This additional planning step is consistent with requirements in urban zonings (i.e. communities are not being treated differently) and commensurate to the significance of the river.

It is recommended that the DP&E establish a uniform set of criteria for assessing planning proposals related to setback variations. These criteria would provide a more consistent and transparent process for assessment of planning proposals related to river setback variations. These criteria would also assist councils and developers to prepare complete and appropriate planning proposals for assessment. These criteria should be developed to consider matters such as:

- **Where is the variation sought?**
  Details of the location, subject zone and applicable minimum lot size.
- **Why is the standard being varied?**
  Details on how the reduced setback would meet objectives such as maintaining and improving water quality, protecting the environmental values of rivers, protecting the stability of the bed and bank and limiting the impacts on natural riverine processes and navigability.
- **What is the impact of the variation?**
  Details of the extent of the variation in response to specific circumstances and topography (mapping would be expected to provide a detailed survey of the river bank the extent of flooding vegetation and other riverine habitat as well as existing development and structures).
- **How is this variation justified?**
  Justification is required in terms of setback design. The varied setback distance should not contribute to increased erosion destruction of the bank have adverse impact on native vegetation or ecological habitats.

4.4.4 Assumed concurrence for setback variations in all zones

It is important that arrangements are in place to protect the riverine environment, particularly where buildings or works do not meet the prescribed riverfront setback standards and seek to encroach into the riverfront setback area. Arrangements should be applied equally across all land use zones as the potential cumulative impact of development along the Murray River is a matter of regional significance.

Consideration should be given to revoking the assumed concurrence delegations for variation to riverfront setbacks for all Murray River councils. As set out in the in the DP&E's 'Guide to Varying Development Standards' (2011), notification of assumed concurrence of the Director-General under clause 4.6(4) (and the former clause 24(4)) of the Standard Instrument (Local Environmental Plans) Order 2006) may be varied or revoked by written notice provided by the Director-General.[15]

Interim measures could also be considered, such as the revocation of concurrence delegations until such time as further work, such as a comprehensive Waterfront Management Strategy has been completed.

4.4.5 Geographic terms

The fine scale determination of the 'high bank' or 'top of bank' is only required in urban or commercial areas close to the river, i.e. on less than 1% of the river, where there is the need to show the setback and the cadastre or survey is unclear. In each case, a survey finds the top of the bank.

The current model provisions aim to protect the environmental functions of the river, provide amenity for its users and enable appropriate development opportunities. The current provisions should continue to be implemented in all river councils. Further guiding information in the form of a Practice Note for the

[15] Department of Planning and Environment, *Varying Development Standards: A Guide – August 2011*, page 8

various elements of river management, such as defining the bank, bed, channel, and information on the procedure for finding, and obtaining approval for variation to setbacks etc. should be prepared. Providing additional information on the changing context of the River Murray may be also be useful, along with the geographic terms of 'inside' and 'outside' bend. The DP&E should prepare this advice with the assistance of water resource agencies and utilising existing data and information including MDBA's LiDAR and river survey data.

4.4.6 Maintain existing vegetated riparian buffers

At a policy level the maintenance of existing vegetated buffers to the River Murray and the associated soil, water and ecological (aquatic and terrestrial) benefits are well established. The cost/benefit of this protection presents a prima facia argument for retention and maintenance of existing native vegetation.

4.4.7 Include more structures in the SI LEP riverfront development clause

From the consultation undertaken there are perhaps more 'structures' (e.g. stairways and access tracks, bike paths, walking tracks) related to recreation that could be included in clause 2 of the model provisions. This needs to be discussed with relevant water management agencies.

4.5 Water resource planning

The MBDA cites the Basin Plan as the main framework for adapting to climate change[16]. The Basin Plan provides a framework for adaptive management that allows state and local governments, industry sectors and individuals to modify how they use water so that levels of extraction are sustainable and the needs of water-dependent ecosystems are met in a changing climate. This will be achieved through:

- holding environmental water under secure entitlements
- annual water resource planning which regulates how much water can be extracted in a given season depending on rainfall, storage levels or flow conditions
- setting annual priorities for delivering environmental water to dependent ecosystems, such as developing long term environmental watering programs.
- allowing more efficient trade of water so that it can be used for its most productive purpose.

The MDBA also has an obligation to review the Basin Plan on a regular basis so that new information on climate variability and climate change risks can be reflected in our management practices. Given the various scenarios and associated levels of confidence on regional climate change impact, the most effective mechanism to appropriately addressing this issue is to ensure that the relevant elements of the Basin Plan are effectively implemented in NSW.

4.6 Community engagement and information

4.6.1 Encouraging behavioural change

The Commonwealth Government recently decided to change the Disaster Recovery Relief Fund by reducing the amount of funding and excluding some development types. This may result in broader behavioural change within the community, including reducing the desirability and development pressure on flood prone river front areas recognising that post flood support may not be available.

Reduced national funding arrangements and changing legislative backdrops will reduce the extent and/or ability for State Government to continue to fully protect councils and agencies from claims for

[16] http://www.mdba.gov.au/what-we-do/research-investigations/climate-change

damages. This pressure is likely to result in tighter development controls on future rezonings in order to cap the extent of current flood liabilities.

Furthermore, there appears to be an increasing reluctance on the part of insurance companies to insure properties within high risk areas, in particular within flood zones. Lack of insurance security and certainty about government 'bail out' is likely to act as a disincentive to those who would have previously been comfortable building within the flood zone. Such market-based drivers of change are likely to be much more incremental that government-driven policy changes, but nevertheless can be significant in the longer term.

Key to encouraging such changes is for government agencies to be proactive and take responsibility for informing communities about such changes in policy direction and their implications. Properly communicated scenarios that represent a win-win are likely to be well received.

4.6.2 Engagement on floodplain risk management plans

The Floodplain Development Manual outlines a process of stakeholder engagement that should be followed in the development of FRMPs. Strong collaboration and support from state agencies and the community will strengthen and streamline the process for developing these plans.

4.6.3 Engagement on environmental watering

Effective engagement with all stakeholders is an important element of addressing issues related to both flooding in general, and environmental watering more specifically. Recent analysis of how Australia addresses natural disasters has highlighted that the desired application of a resilience based approach is not solely the domain of emergency management agencies or government, but rather, it is a shared responsibility between governments, communities, businesses and individuals. Stakeholders at all levels, have a significant role in strengthening the nation's resilience to disasters, in particular known high risk areas such as floodplains.

The Environmental Watering Plan developed under the Basin Plan and as a requirement of the Commonwealth *Water Act 2007*, highlights the importance of 'localism' in delivering environmental water management and reform. The MDBA recognises that it needs to cooperate as effectively as possible with the Basin States' regional water management organisations and other Commonwealth agencies. The delivery of the Environmental Watering Plan could be further enhanced through engagement with the people who live in, work in and care for the Basin environment and by utilising their available skills, knowledge and local experience.

The nexus between localism and this study lies in the perception from some councils that environmental watering is creating problems for local tourism due to flooding of infrastructure and lack of water availability at key times of year. Another perception lies in the understanding that streambank scouring/erosion is caused by environmental watering. In reality such streambank impacts are caused by the annual management of bank full flows from Hume Dam to South Australia for almost an entire year to meet irrigation demand and to fill Lake Victoria when the Menindee Storage is empty.

Effective engagement between relevant Environmental Water Allocation Groups (EWAGs) and local agencies and other stakeholders will be key to determining if perceptions and realities are well aligned, and what ensuing actions are required. Affected stakeholders need to be engaged about the real and perceived risks from environmental watering. This should be led by the (EWAGs) and take account of the key principle of 'localism' as required in the Environmental Watering Plan.

4.6.4 Build trust in science

Agencies need to engage with the scientific community to better align management/planning information gaps with research i.e. co-establishing research priorities. Science can be further promoted by agencies (state and local) engaging effectively with the scientific community, both to disseminate results and to align management/planning information gaps with research. Cooperative development of research priorities benefits all concerned, in that the research and scientific investigations have real-world applicability. Demonstrating non-academic research partners and/or support is often also beneficial in securing research funding, thereby providing incentive to researchers to co-align priorities with those of government/industry.

Building trust in the use of science to underpin planning controls and decision making can be done through a variety of means. Examples include:

- Communicating/promoting good news stories e.g. where environmental watering has resulted in improved condition of the river.
- Providing stakeholders with robust information about the scientific justification for decisions (e.g. science behind setbacks).
- Working with local governments to correct inaccuracies in mapping products.
- Providing training and capacity building in the use of planning tools such as overlays.
- Leveraging off existing policy and funding arrangements to undertake studies e.g. Floodplain Risk Management Plans.

4.6.5 Riverbank erosion study and information

The issue of riverbank erosion and confusion around its causes is well discussed in the *Draft Riverina-Murray Boating Plan* (Transport for NSW 2014). The Plan highlights concerns from some river users that high speed boats are the primary source of riverbank erosion in some parts of the river. However, this conclusion has not been supported by empirical study, as there are many different causes of erosion. Prior to investing in measures to address erosion and/or restrict river usage, appropriate study into the causes of the erosion is required. This is highlighted in the Plan, along with an action to partner with councils and stakeholders to further explore and respond appropriately to the issue.

4.7 Funding and resources

4.7.1 Fit for the future reforms

Fit for the future is a reform program for local government throughout NSW. The intention of the reforms is to provide rural councils with legislative, financial and structural adjustments to improve performance into the future. The reforms seek to maximise opportunities to work together through formal arrangements such as Council mergers or new Regional Joint Organisations or less formal use of shared arrangements with neighbouring councils. At the time of writing, proposed mergers had been announced by the Minister for Local Government. These mergers will be referred for community consultation and review in early 2016.

Many Councils along the Murray River express common concerns and challenges with respect to development associated with the river. Opportunities to resolve these and work in partnership (e.g. to jointly fund studies or data collection) should continue to be explored during the fit for future reform process.

4.7.2 Better regulation

Streamlining and removing unnecessary duplication in process is a key element of effectively using resources. Further to this, policy makers at all levels of government need to recognise limited capacities and not create unsustainable policy environments or adopt/advocate for resource intensive options. This is relevant both at the ‘front end’ in terms of policy/plan/program development and also at

the 'back end' in terms of compliance checks and enforcement. These concepts are embodied in the NSW Government's Seven Principles of Better Regulation[17] and the requirement for Better Regulation Statements and/or Regulatory Impact Statements.

4.7.3 Incentives

Within the planning system there are few financial mechanisms to incentivise policy applicants to achieve policy outcomes. For example, would government consider waving licence fees if applicants pooled or shared riverfront development such as moorings or pontoons? Other incentives come through the use of code compliant development options, whereby applicants are spared a comprehensive approvals process when development is undertaken in accordance with prescribed standards.

As discussed above, on-going incentives to keep development away from the river are likely to arise over time as it becomes more difficult to develop on flood prone land.

4.7.4 Building on existing opportunities

The other key way to use resources more strategically is to leverage off existing programs and pool resources. An excellent example of this is the NSW Government Floodplain management grants, where a local investment will attract a twofold matching investment from the state. Other examples of current programs and/or pooled resources that could be leveraged off, which are relevant to this study include:

- the development of regional boating plans, led by the RMS, which have actions to address several of the boating related issues identified above
- environmental grants programs e.g. NSW Environmental Trust, National Landcare Program, Building Resilience to Climate Change program, which can be tapped into to fund programs to improve the ecological and environmental values of the river
- EWAGs, who coordinate the delivery of environmental watering and are made up of representatives from a number of agencies
- Regional Planning Networks, who can identify and address regional issues in a strategic and coordinated way and facilitate cooperation and networking at a regional level

4.7.5 Up-front investment

Stretched resources can be used more effectively by investing 'up-front' in key strategic actions that will alleviate on-going issues. Often, the up-front investment of time and resources may be discouraging, however, the benefits are likely to become apparent when evaluated against longer term gain. It will be up to individual councils and/or applicable regional groups to evaluate and decide whether the longer term strategic benefit of undertaking such actions is worth the up-front investment. Examples include:

- developing Flood Risk Management Plan vs evaluating every individual DA for flood issues
- preparing mooring management plans vs dealing with moorings on an ad hoc basis
- specifying that the river setbacks are not able to be varied by clause 4.6
- educating local stakeholders about environmental watering vs responding to on-going complaints about water levels.

[17] http://www.dpc.nsw.gov.au/__data/assets/pdf_file/0009/16848/01_Better_Regulation_eGuide_October_2009.pdf

4.7.6 User pays

Studies (including pilot studies) to understand key impacts may be funded via fees collected from users, thereby creating a link between use and outcomes. The NSW Recreational Fishing Trust provides a model for this, whereby money raised from the NSW recreational fishing fee is placed into the Trust and spent on a variety of activities including research. Another example could be to use funds from boat licences to fund investigations into wake related erosion.

If an urban development proposes to rely on the creation or extension of flood levee banks then ongoing maintenance and funding are to be incorporated into s94 contribution calculations so that financial and flood related impacts to neighbours and other dwellings (upstream or downstream) are address

4.7.7 Exemptions

Exemptions from rates and land tax for flood liable land need to be considered against increased costs and liability. The aim would be to exempt people owning flood liable land from such rates/levies/taxes as they are unable to "fully" develop the site, therefore providing an incentive not to develop. This analysis is beyond the scope of this report but a consideration for NSW Treasury and councils.

4.7.8 Funding for new setbacks

Where the setbacks have been (or will be) instituted, a funding and maintenance model needs to be established. A single source is unlikely, if the land is not privately owned (e.g. in council ownership). Multiple options exist through developer contributions, local government levies and rates, environmental grants, state government program funding, crown land management, user pays schemes, irrigation water revenues, and MDBA initiatives.

5 Recommendations

The following table summarises the 20 key recommendations from the report.

Table 8: Key Recommendations

Theme	Recommendations
Flooding	1. **Finalise Floodplain Risk Management Plans (FRMP) for all LGAs –** with the support of State agencies. 2. Develop **Floodplain Risk Management Plans (FRMP) for all LGAs which have not yet commenced the process** – with the support of State agencies. 3. **Update Flood Planning Area maps in LEPs** - using updated information from endorsed FRMPs. 4. **Update and implement new Flood Planning Levels -** (where necessary), using updated flood mapping from the FRMPs.
Urban Development	5. **Prohibit urban land releases in high hazard flood prone areas –** as identified in endorsed FRMPs. This prohibition will need to be drafted into s117 Directions (4.3 Flood Prone Land).
Buffers, setbacks and overlays	6. **Retain minimum river setback distances** of 40 metres for urban zones and 100 metres for rural zones in Local Environmental Plans. 7. **Amend the model river setbacks clause** (and those LEPs containing river setbacks clauses) to expressly include provision for infill development in urban areas and zones. 8. **Amend the model clause 4.6(8) (Exceptions to development standards)** to expressly preclude the model river setbacks clause from variation – except for variations for applying to infill development. 9. **Investigate the options for revocation of council's assumed concurrence** delegations in relation to the variation of riverfront setbacks. 10. **Prepare practice notes** or similar that detail the various elements of river management including: • changing context of the Murray River; • the definition of inside and outside bend; • application of 'high bank' and 'top of bank' definitions including: i. classification of the 'river geomorphologies' with specific high bank definition and ii. fine scale mapping of the 'high bank' within urban areas where cadastre information is insufficient.
Waterfront Management	11. **Develop a multi-agency Waterfront Management Strategy** – led by DPE, in conjunction with other state agencies for the River Murray. 12. **Align existing local tourism and recreation strategies** with the Murray Tourist Destination Management Plan. 13. **Investigate the opportunity to develop dedicated river use zones** – including high impact ski zones and low impact / passive use zones in areas where impact of respective activities can be minimised and/or are consistent with management goals for that river reach. 14. **Support the actions in the Regional Boating Plan Murray-Riverina Region** – including partnering on implementation if appropriate. 15. **Streamline approval process for moorings** – through development of supporting guidelines to expedite approvals process and investigating single authority/single approval process.

Theme	Recommendations
Government decision making	16. **Streamline complying 'bed and bank' and riverfront DAs** – through a development of construction guidelines to streamline the assessment approach. 17. **Review and update the DPI Water guidelines for complying structures on watercourses** in line with the amended controls contained in Section 4.1.1 of this report. 18. **Utilise existing programs and partnerships to leverage improved management outcomes** – implementing incremental change by building on existing work and partnerships to reduce duplication, improve efficiencies and share financial and human resources.
Science	19. **Build community awareness and understanding of river-related issues** – including 'good news stories' and 'accessible science' through local media. 20. **Support research into key issues** – including addressing key knowledge gaps. 21. **Interpret and implement climate risk adaptation measures** – from the Basin Plan and continue to update climate risk management measures as the Basin Plan is updated.

References

Australian Business Roundtable for Disaster Resilience and Safer Communities 2013. *Building our nation's resilience to natural disasters*

Benson, D. and Howell, J. 1994. 'The natural vegetation of the Sydney 1:100,000 map sheet.' *Cunninghamia* 3(4).

Comrie 2011. *Review of the 2010–11 Flood Warnings & Response: Final Report*

Council of Australian Governments 2011. *National Strategy for Disaster Resilience*. Attorney-General's Department.

Hansen, B, Reich. P, Lake, S & Cavagnaro, T, *Minimum width requirements for riparian zones to protect flowing waters and to conserve biodiversity: a review and recommendations: With application to the State of Victoria* Report to the Office of Water, Department of Sustainability and Environment April 2010 School of Biological Sciences, Monash University.

Jontos, R. 2004. 'Vegetative buffers for water quality protection: an introduction and guidance document.' *Connecticut Association of Wetland Scientists White Paper on Vegetative Buffers*. Draft version 1.0. 22pp.

Koehn, J.D., Brierley, G.J., Cant B.L. and Lucas, A.M. 2001. *River Restoration Framework*. Land and Water Australia Occasional Paper 01/01.

Northern Territory Department of Natural Resources, Environment, The Arts and Sport (2010) *Land Clearing Guidelines – Technical Report No 20*, Darwin. Northern Territory.

NSW Department of Planning 1998. *Managing Land Contamination: Planning Guidelines SEPP 55 – Remediation of Lands.*

NSW Department of Planning, Infrastructure and Natural Resources 2005; *The Importance of the Riparian Zone in Water Resource Management*:

NSW Department of Water, Environment and Natural Resources 2014. *Crown land along the River Murray* Fact Sheet.

NSW Land and Property Information, 2015 Registrar General Directions: Survey Definitions of Natural Boundaries;
http://rgdirections.lpi.nsw.gov.au/deposited_plans/natural_boundaries/survey_definition

NSW Office of Environment and Heritage (OEH, Framework for Biodiversity Assessment rules found at http://www.environment.nsw.gov.au/biodivoffsets/140675fba.htm, sourced in November 2015

Price, P., Lovett, S. & Lovett, J. (2005) *Managing riparian widths*, Fact Sheet 13, Land and Water Australia, Canberra

Victorian Department of Natural Resources and Environment 1996. *Mallee Parks Management Plan*.

Victorian Department of Sustainability and Environment 2003. *Forest Management Plan for the Floodplain State Forests of the Mildura Forest Management Area*.

Wegner, S. 1999. *A Review of the Scientific Literature on Riparian Buffer Width, Extent and Vegetation*. Office of Public Service & Outreach Institute of Ecology. University of Georgia.

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