CHAPTER 3.10 WETLANDS MANAGEMENT

1.0 INTRODUCTION

1.1 Objectives of this Chapter

The aim of this Chapter is to protect Wyong's natural wetland areas and facilitate the ecological functioning of all wetlands and maintain the significant conservation values of these environments for the benefit of present and future generations. The objectives of this plan are:

- To protect important wetland habitat and discourage development proposals that have the potential to fragment, pollute, disturb wetlands or diminish the environmental values of such areas
- To maintain the functions of low lying lands for the purpose of improving downstream water quality for the benefit of the Tuggerah Lakes and Lake Macquarie systems
- To encourage land use practices and environmental design measures that enhance the sustainability of wetland functions and values

1.2 Glossary

Note: Generally, the terms used in this Chapter have the same meaning as those terms are defined within the WLEP 2013. Where a term is defined within the WLEP 2013, it is not repeated here. The following additional terms are relevant to this Chapter:

clearing of native vegetation means directly or indirectly:

- killing, destroying or burning native vegetation; or
- removing vegetation; or
- injuring or substantially damaging vegetation in any other way.

dominated by wetland plant species means that 50% or more of the total foliage cover of the tallest stratum of vegetation comprises wetland plant species.

draining, also defined as **drainage** (LEP), which means any activity which alters the hydrological regime of any locality by facilitating the removal of surface or ground water. It includes the construction, deepening, extending, opening, installation or laying of any canal, drain or pipe, either in a locality or in such a manner as to encourage drainage of an adjoining locality.

ecotone means the gradational band of vegetation where wetland plants intermix with dryland plant species.

filling means changing the existing ground level by disposal of soil, dredging, refuse dumping or by any landfill method. This includes, but is not limited to activities which require the addition of fill to enable the construction or erection of buildings or structures, public utilities, pylons and roads.

foliage cover means the proportion of the sample site occupied by the vertical projection of foliage and branches of trees, shrubs or herbs.

map means the map marked "Development Control Plan - Wetlands (Map)".

tallest stratum means the tallest growth form of vegetation present that has an average foliage cover of 20% or greater.

underscrubbing means the cutting down of native trees (with a trunk diameter less than 75mm, measured 1.4 metres above the ground), saplings, shrubs or other understorey vegetation (except a cycad or mangrove) which is less than 3 metres high.

wetland means swamps, marshes, wooded wetlands and ponds which are subject to inundation for a long period of time. These areas may be freshwater or estuarine, where the frequency and level of inundation determines the type and productivity of the soils and the plant and animal communities. These environments must be readily identifiable as being dominated by wetland plant species.

2.0 GENERAL MATTERS FOR CONSIDERATION

2.1 Development within Wetland Management Areas

When assessing an application in an area covered by this DCP Chapter, Council will consider how well the proposal complies with the following objectives and requirements.

OBJECTIVE

- To protect the environmental values and functions of wetlands from the potential impacts of adjoining land uses

REQUIREMENTS

a Where development is proposed near a wetland, bands of natural vegetation, known as buffers, should be kept between the development and wetland. A diagram showing a buffer zone of non-wetland vegetation separating development from the wetland edge is shown at Figure 1. Buffers provide supplementary fauna habitat and vegetatively linked buffers may potentially facilitate the movement of fauna between areas, thus maintaining ecosystem function and genetic diversity. The width of the buffer zone depends on factors such as the existing vegetation type, surrounding land use, slope, potential for weed invasion and potential for nutrient impacts on the wetland. Specialist advice from suitably qualified people should be sought on the width and management of wetland buffers for development adjoining wetland sites.

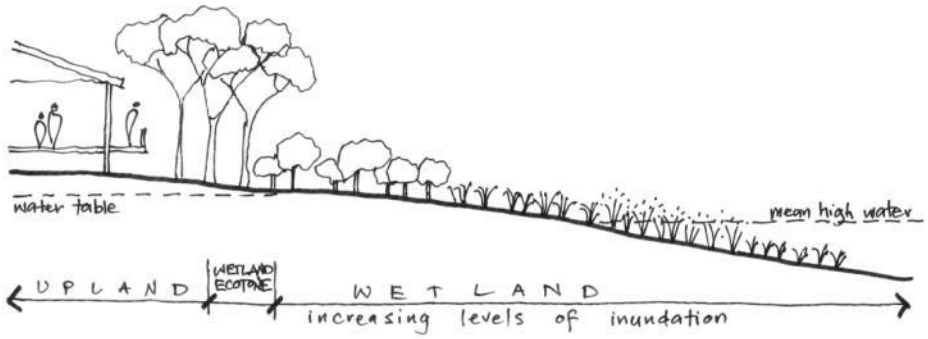


Figure 1 Buffer Zone of non-wetland vegetation separating development from the wetland edge

b Separate wetlands from development edges by the construction of a road or cycleway. This provides a hard management edge and firebreak to the wetland. Refer to the Urban Interface Area provisions within Clause 3.9 of Part 4 – Subdivision.

c Discourage the clearing of wetland boundaries and minimise disturbance to ecotones. Clearing and disturbance will only result in pushing the disturbed area further into previously undisturbed wetland vegetation, thus further impacting the wetland ecosystem.

d If grazing is to be conducted on land adjoining wetland areas, owners should be encouraged to fence the wetland and native vegetation to prevent intrusion by stock.

e Avoid separation of wetland habitat and retain existing wildlife corridors to increase habitat values. Where corridors are not linked, fencing of areas and/or supplementary planting of endemic vegetation is recommended to increase the long-term viability of the corridor.

f The development interface must be carefully managed in locations which border wetland communities. Berms, stilling ponds, filter strip and nutrient control facilities (WSUD elements) shall be developed downstream of urban areas to reduce nutrient and weed transport into downstream wetlands. Figure 2 shows a catch drain to direct surface runoff from urban areas to dispersion points. This reduces the potential for weed invasion and adverse hydrological changes to the wetland.

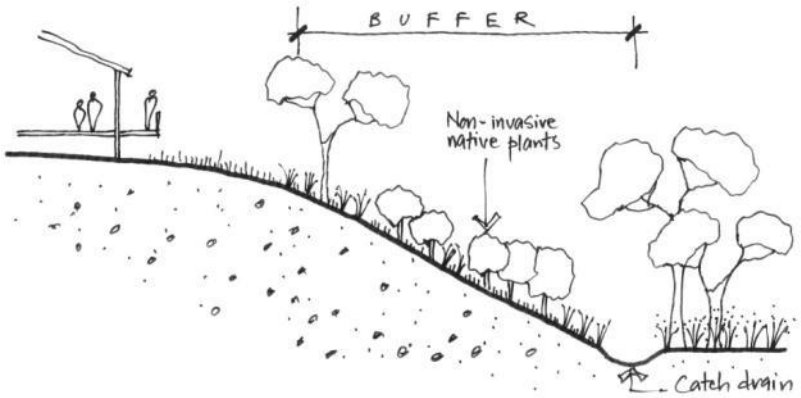


Figure 2 Catch drain to direct surface runoff from urban areas to dispersed points

2.1.1 Hydrology

Water is the major feature of wetlands. Changes to catchment hydrology can, in turn, change the frequency, timing and depth of inundation, resulting in changes to the characteristics of wetlands and ultimately changes to adjoining lands or those lands elsewhere in the catchment.

The encroachment of urban and rural areas into natural catchments areas has the potential to modify downstream surface and groundwater flows. This can be to the detriment of a number of water tolerant species which rely on groundwater flows, such as those that occur in swamp forest wetland types. The loss of these groundwater flows leads to the loss of swamp forests and ultimately favours dryland terrestrial plant species.

Unmitigated development can result in excessive stormwater runoff and reduced water quality which can significantly impact on downstream wetlands. Development in wetland catchments reduces groundwater infiltration and water quality, and increases the permanency and frequency of hydration. This can weaken the root structure of wetland trees, resulting in dieback. A diagrammatic representation of the effects of development in the wetland catchment is shown in Figure 3.

OBJECTIVE

- To maintain or restore the physical, chemical and biological processes existing in wetlands by minimising existing impacts on or exacerbating changes to hydrology from land uses in catchments

REQUIREMENTS

a When development proposals are being considered upstream of wetland ecosystems, proponents are to ensure that all likely changes in surface runoff and groundwater flows are adequately investigated and assessed. A catchment based approach to the management of stormwater runoff, is required in order to mimic as far as practicable pre-development hydrological conditions.

b Requirements may also exist under the Water Management Act 2000. Applicants may need to consult with the NSW Office of Water to9 obtain relevant approvals or licences.

c The type, employment and location of culverts, drains, and paved surfaces should be carefully considered, to ensure the maintenance of appropriate water flow regimes to downstream wetlands. Where possible, the use of natural drainage structures are preferred.

d Drainage works without appropriate environmental safeguards should be avoided, due to the potential impacts of falling or rising water tables. In some cases, falling water tables will cause the exposure of acid sulphate soils. This may cause water quality management problems or the formation of acid scalds which can kill vegetation and cause increased sediment runoff.

e Developments which are likely to have a significant impact on the hydrology of significant wetlands shall prepare a wetland management plan. This plan is to provide a comprehensive framework for managing environmental impacts including mitigation measures. The management plan should incorporate an environmental monitoring program encompassing relevant biological, physical and chemical parameters to detect any adverse changes in the health of the wetland ecosystem.

f In the event that mitigation measures do not work satisfactorily, the management plan needs to clearly indicate the commitments given by the proponent to rectify the problem. The commitments should contain the following elements:

i Who will deal with the issue?

ii How will they deal with it?

iii In what timeframe will they deal with it?

iv Who will they report these actions to?

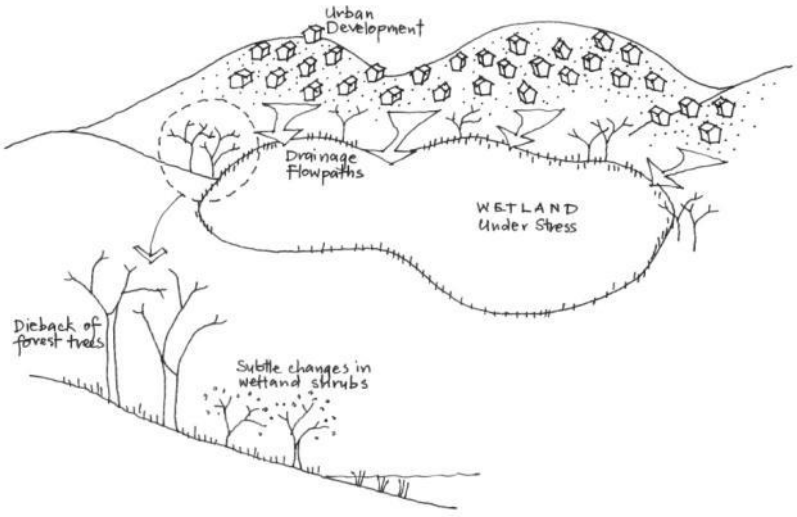


Figure 3 Effects of unmitigated development in the wetland catchment

2.1.2 Water Quality

Stormwater pollution can lead to the nutrification of habitat for wetland dependent flora and fauna which rely on the healthy functioning of wetlands for their survival. The most at risk are wetlands within catchment areas which are subject to development pressures. Discharge of sediment is the greatest concern during the urban development construction phase, whilst discharge of nutrients are of a greater concern after the land has been developed.

OBJECTIVE

- To ensure water entering into natural wetlands is of sufficient quality so that wetland conservation values and functions are not compromised

REQUIREMENTS

a Drain construction and utility provision shall avoid excavation through wetlands.

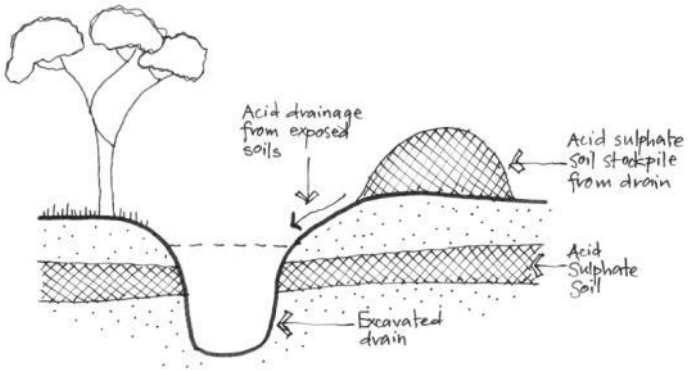


Figure 4 Impacts of exposing acid sulphate soils

b Acid sulphate soils (ASS) are often present within low lying wetland areas. Works that are likely to expose acid sulphate soils, should be carried out with extreme caution, as excavated acid sulphate soils can leach highly acidic drainage waters which scald soils, which are then difficult to revegetate (as shown in Figure 4 above). The Department of Planning and Infrastructure have provided data to Council identifying (ASS) Risk classes, which should be used to determine the likelihood of ASS. If ASS are present on site, a detailed and site specific ASS management plan should be prepared. Applicants should have regard to Clause 7.1 of the WLEP 2013 and the Acid Sulfate Soils Map.

c A dispersed discharge of stormwater into a wetland is preferable to a concentrated flow regime. Create sheet flow conditions to avoid concentrated discharge into a wetland. Figure 5 below shows how stormwater from a surface drain can be dispersed using embankments.

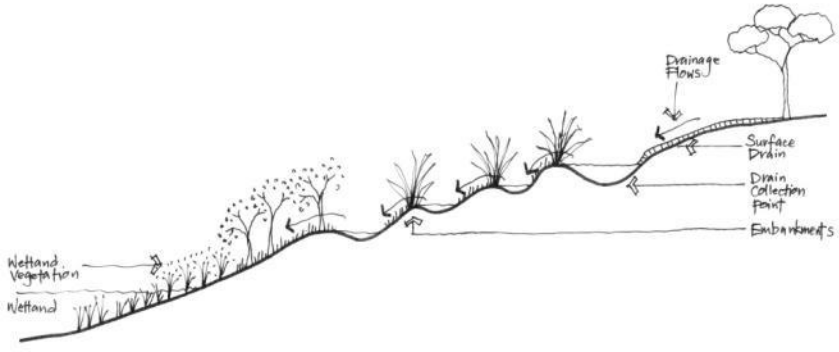


Figure 5 Embankments are used to disperse stormwater from a surface drain

2.1.3 Bushfire Hazard Reduction

Whilst fire has the potential to be used in wetland management to reduce the build up of combustible material its use as a management tool should not be considered without detailed knowledge of the environmental effects of fire on fire sensitive wetland flora and fauna.

OBJECTIVE

- To conserve biological diversity and ecological processes by giving consideration to appropriate fire management regimes and permanent hazard reduction techniques in wetland environments

REQUIREMENTS

a The use of permanent fuel hazard reduction measures, such as building setbacks, fuel hazard radiation zones and fire trails shall be favoured as a hazard reduction technique in areas adjoining urban development rather than broad area burning for the purpose of reducing fuel loads.

b All wetland areas should not be subject to broad area burning, with a mosaic burning approach adopted. Areas left unburnt (habitat refuges) should be provided if an area is to be subjected to hazard reduction burning.

c Burning of wetland areas shall have regard to the sensitivity of wetland plant and animal communities and the natural frequencies and intensities of fires in such environments at different times of the year.

d Owners of wetland areas will not be permitted to carry out burning activities without obtaining appropriate authorisation and should consider relevant provisions of Bushfire Management Plans which have been prepared for Wyong Shire pursuant to Section 41A of the Rural Fires Act, 1997.

e Any proposal for bushfire hazard reduction should have regard to those management plans pertaining to that particular wetland area. In those areas where hazard reduction is considered as an appropriate management option, the hazard reduction should be conducted in accordance with the prescriptions identified in the management plan.

2.1.4 Visual, Social and Cultural Values

Many wetlands possess scenic qualities which contribute to the landscape character of the area and provide social and recreational values important to local communities.

OBJECTIVE

- To preserve the aesthetic, social and economic values of wetland areas

REQUIREMENTS

a The impact of disturbance on wetlands has the potential to reduce the values and long-term viability of wetlands. Types of disturbances on wetlands include: direct (i.e. clearing, infilling, etc) or indirect: (i.e. inappropriate location of development in the vicinity of wetlands). In the latter, careful placement of development using landscape screening measures, sympathetic building placement, natural colour schemes and non-reflective materials can be implemented to reduce the impacts on wetlands.

b Maintain floodways and high hazard flood liable lands, and functions of low lying lands for nutrient cycling and sediment filtering by restricting development.

3.0 WETLAND MANAGEMENT AREAS

Some wetland areas are subject to protection by State Environmental Planning Policy No 14 - Coastal Wetlands (SEPP 14). Developments in or near wetlands protected by this Policy may be defined as "Designated Development" by SEPP 14, or by the Environmental Planning and Assessment Regulation 2000. Many other significant wetland areas in Wyong Shire are also protected by the E2 – Environmental Protection Zone under the WLEP 2013. In this Chapter, these lands are identified as Wetland Management Areas.

3.1 Development within a State Environmental Planning Policy No 14 Wetland Area

Certain development within SEPP 14 areas (clearing, filling, draining or the construction of levees) are defined as "Designated Development" and applications are required to be accompanied by an Environmental Impact Statement (EIS). Applicants are advised to refer to the details of this policy and to seek and address the requirements specified by the Director-General of the Department of Planning and Infrastructure.

The maps attached to this Chapter show the approximate coverage of State Environmental Planning Policy No 14 - Coastal Wetland areas in Wyong Shire. Information regarding the location of State Environmental Planning Policy No 14 boundaries should be obtained from the 1:25,000 map series held by the Department.

3.2 Wetland Management Areas

The accompanying Maps identify Wetland Management Areas, covering a range of low lying and wetland buffer areas which maintain water quality in downstream environments and maintain the ecological integrity of wetland, river and lake systems in Wyong Shire. Proper consideration of development within Wetland Management Areas relies on an understanding of the functions and values that the site performs within the landscape.

An evaluation chart (Appendix A) has been prepared to assist in the identification of conservation values and functions performed within different parts of the landscape which are identified as Wetland Management Areas. These matters should be addressed by applicants who are undertaking development within any area identified on the Wetland Management Area Maps.

3.3 Application For Development Within Wetland Management Areas

a All Development Applications for works within Wetland Management Areas must be accompanied by a Statement of Environmental Effects (SEE). The Statement of Environmental Effects shall provide:

i an assessment of the sites geomorphologic characteristics and established wetland conservation values and functions the land may perform or contribute having considered the Evaluation Chart contained in Appendix A to this Chapter;

ii the developments relationship with the Wetland Management objectives provided in Section 2 of this Chapter;

iii a detailed description of the development including any environmental safeguards and mitigation measures;

iv a vegetation survey and map (defining the wetland boundaries);

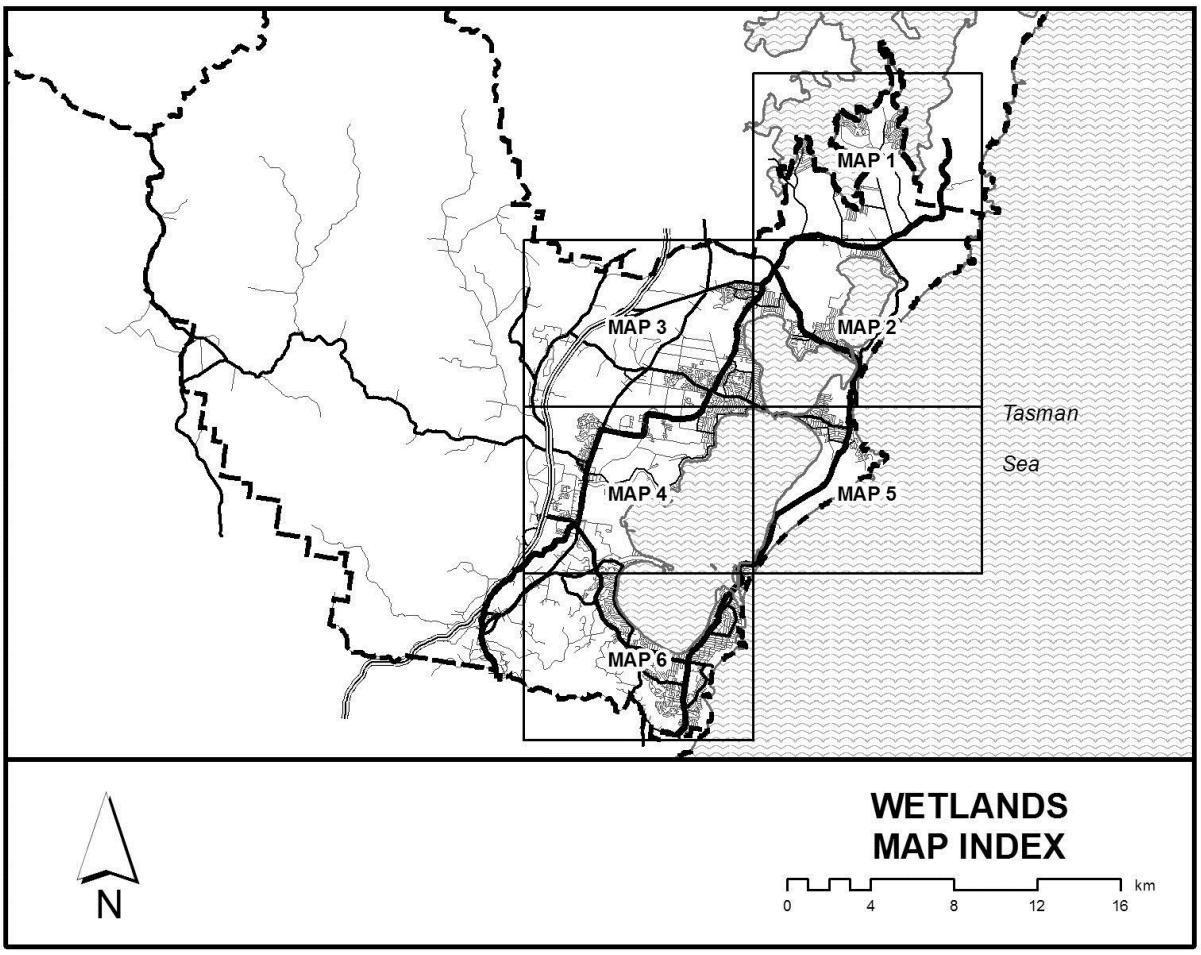
v the environmental effects of the proposed development including, (but not limited to), the effect of the proposed development on:

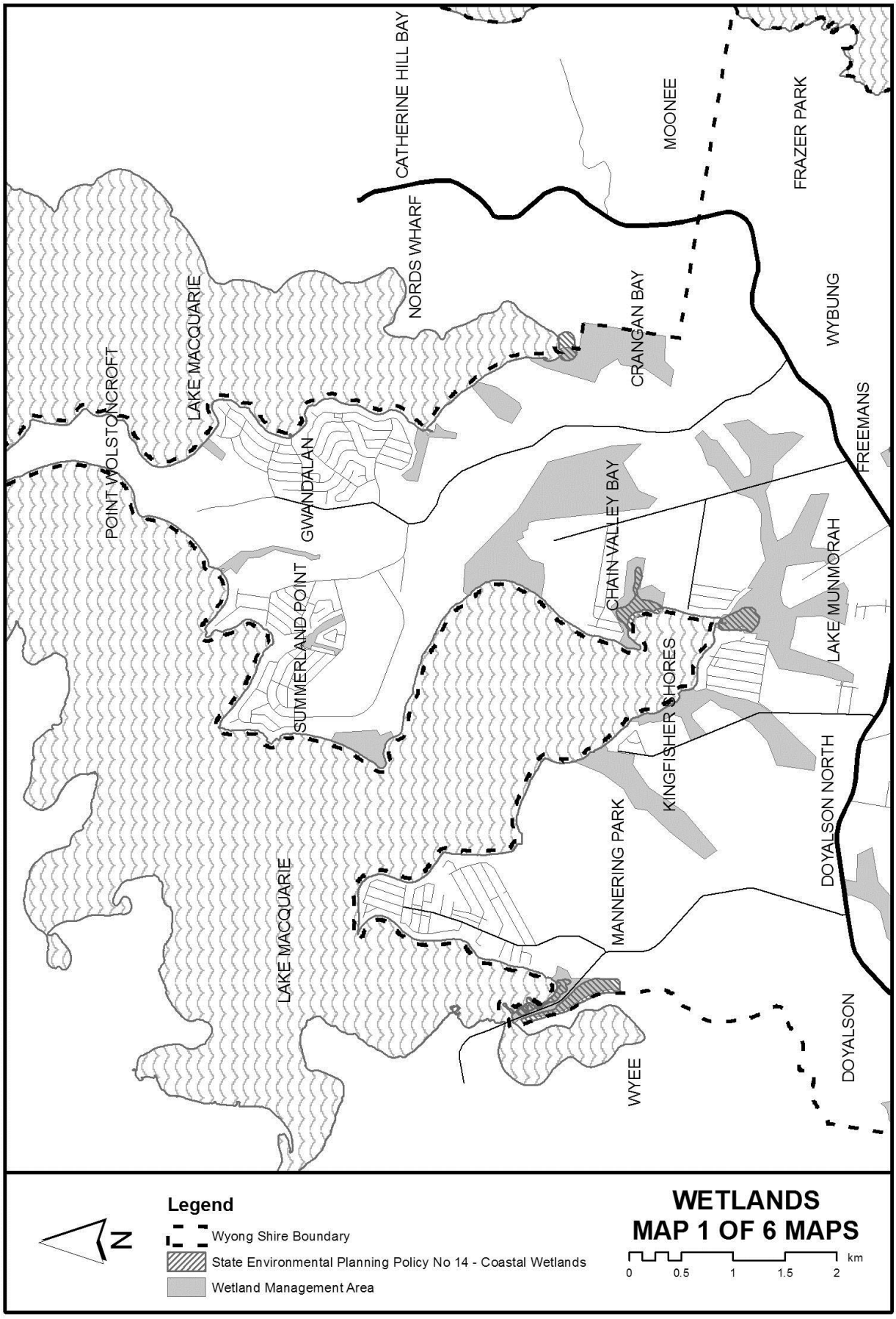
- the growth of native plant communities;
- the survival of native wildlife populations;
- the scenic value of the area;
- the surface and groundwater characteristics of the site on which the development is proposed and of the surrounding area, including water quality; and

vi cumulative impacts resulting from a number of activities with similar impacts interacting with the environment in the same catchment;

vii the on-going environmental management commitments to the site, including any monitoring program and environmental management plan.

3.4 Wyong Shire Wetland Maps

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POINT WOLSTONCROFT
LAKE MACQUARIE
GWANDALAN
FREEMANS
CHAIN VALLEY BAY
SUMMERLAND POINT
LAKE MUNMORAH
KINGFISHER SHORES
DOYALSON NORTH
MANNERING PARK
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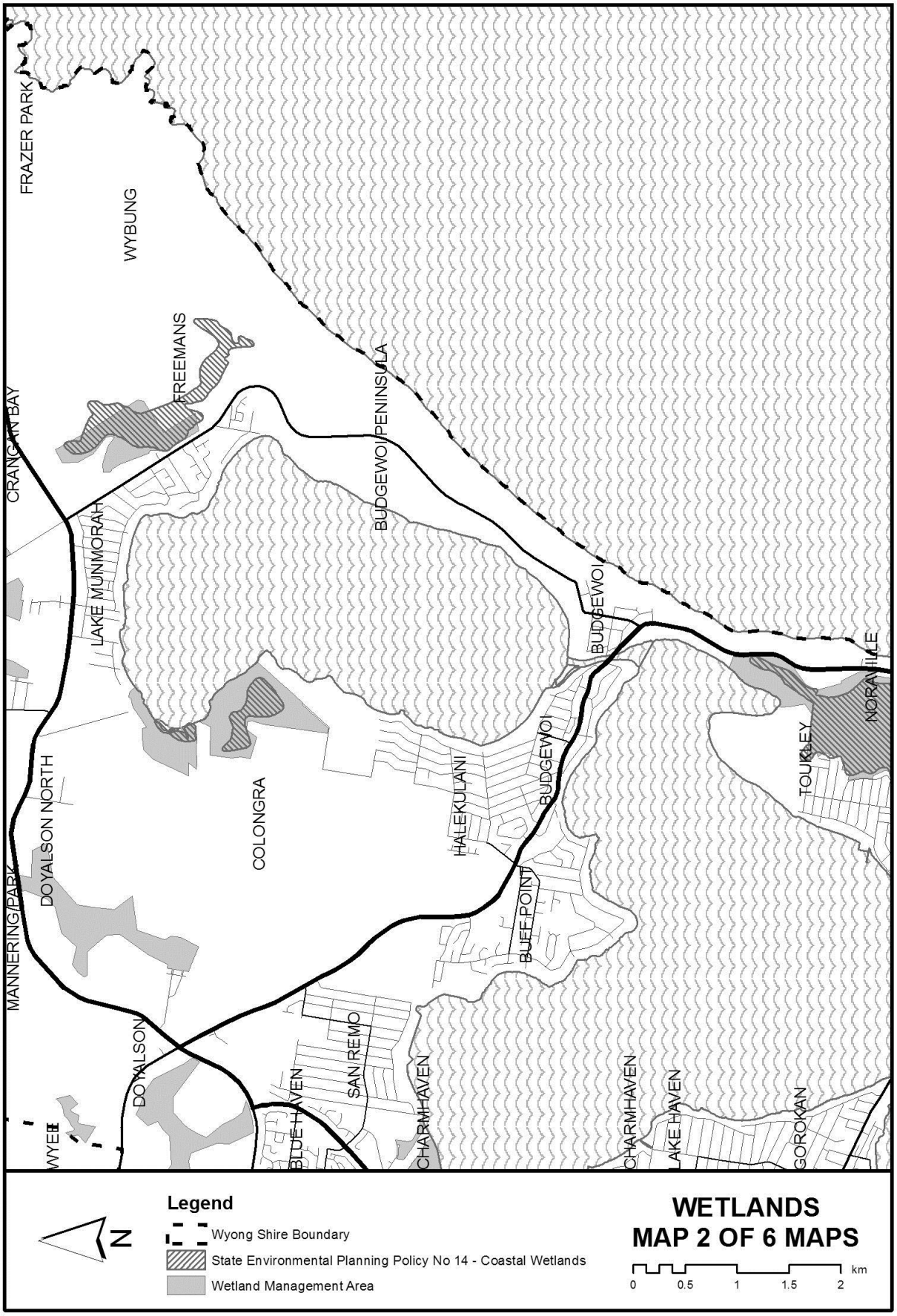
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DOYALSON NORTH
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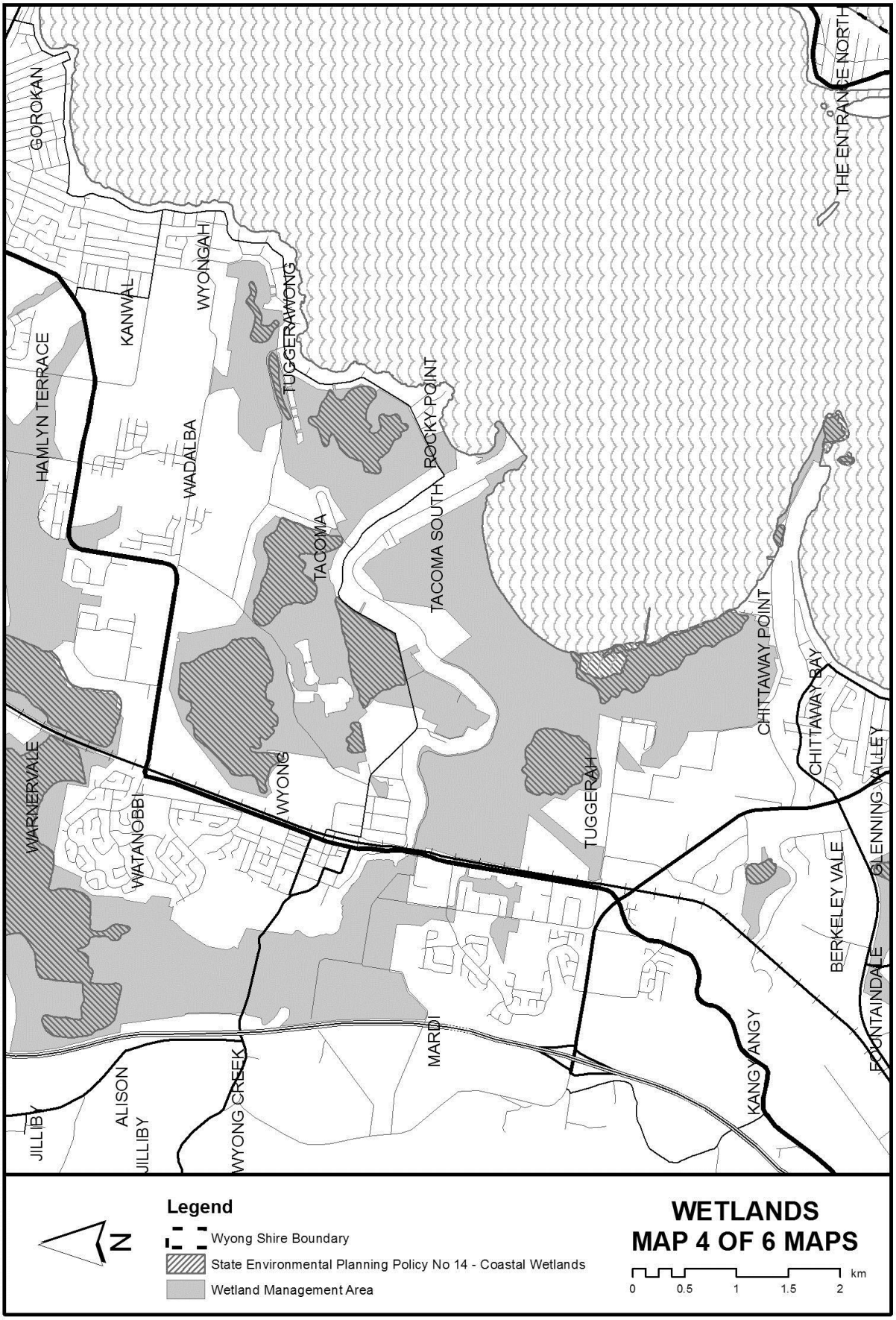
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CHITTAWAY BAY
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WARNERVALE
WATANOBBI
WYONG
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BERKELEY VALE
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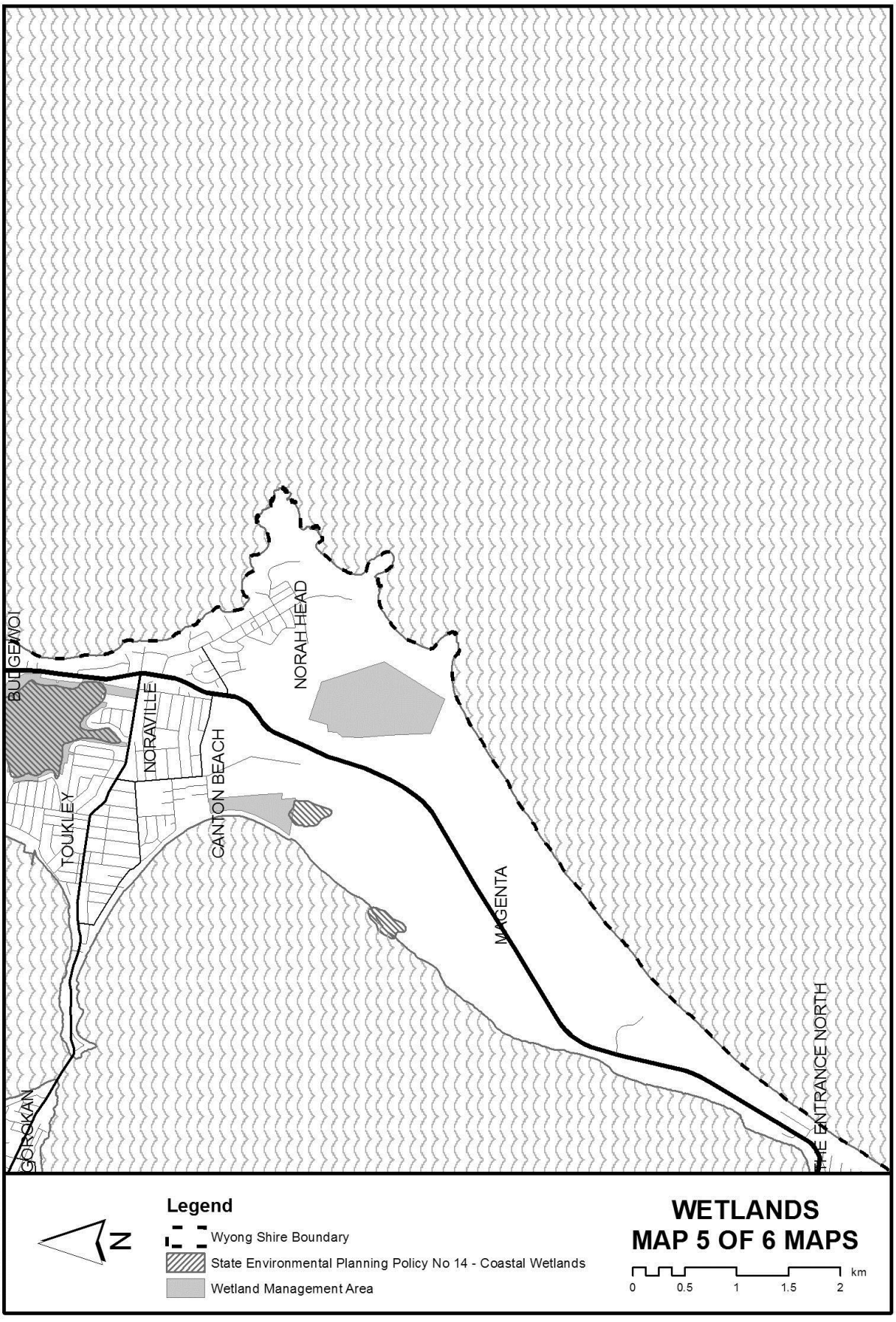
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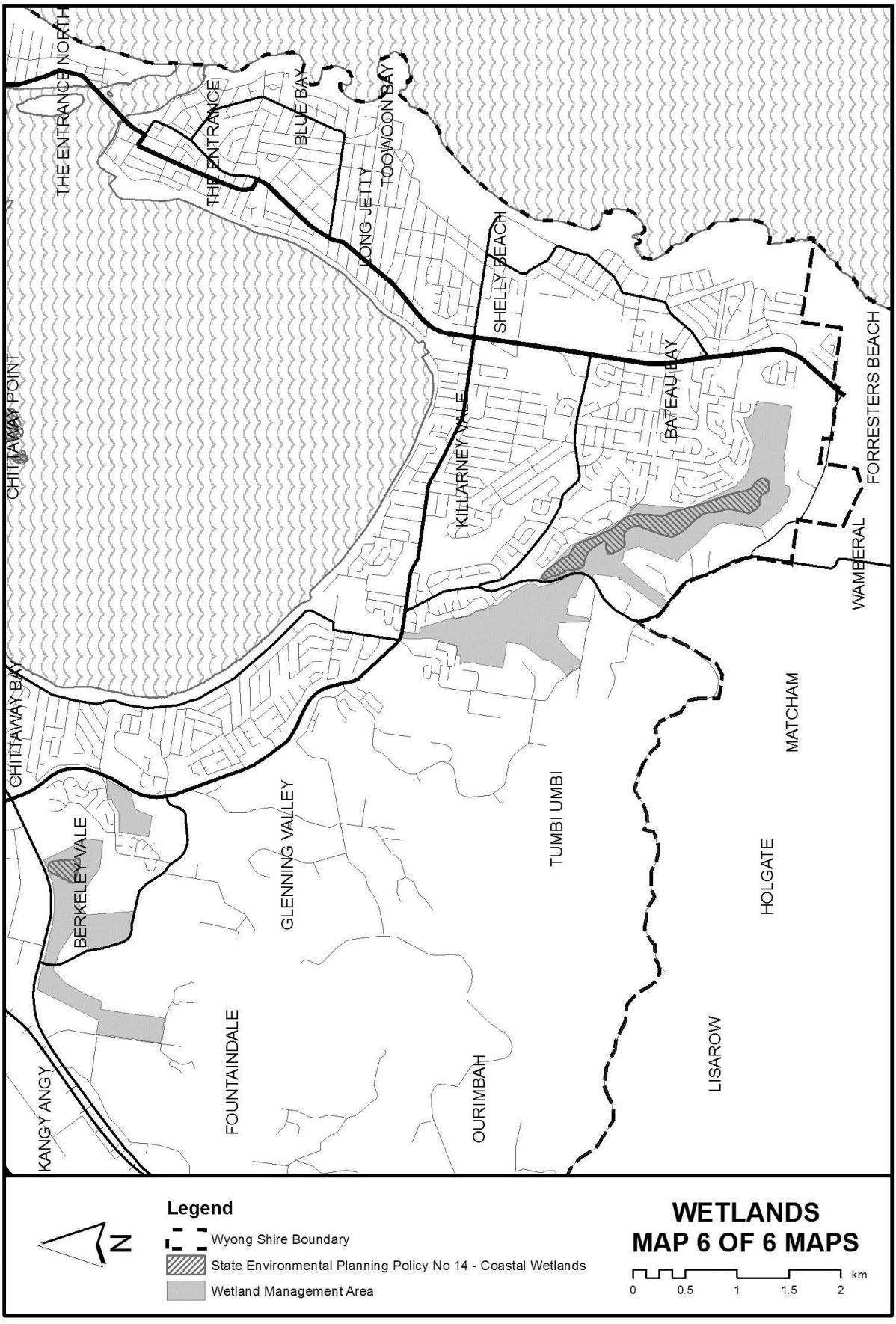
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APPENDIX A WETLAND EVALUATION CHART

Values and Functions	Attributes	Element Assessment
Nutrient Cycling and Sediment Filtering	**Surface and vegetation roughness** is an influential factor in floodwater velocity, as increasing amounts of sediment (nutrients attached to soil particles) are deposited under low velocity conditions.	▪ Woody vegetation with shrub understorey has the highest value for sediment removal, however, reedlands/rushlands have a higher biochemical capacity to treat nutrients (higher value). ▪ Woody vegetation with grassy understorey (moderate value). ▪ Pasture/grasslands (lower value).
	Flooding - extent, regularity and depth of flooding are important factors which influence the nutrient cycling and sediment filtering value of land.	Floodways and floodplains which are regularly inundated by low velocity floodwaters have higher values than areas which are inundated less frequently and have high velocity floodwaters.
	Land slope and shape are important factors .	▪ Drainage depressions, for example ancient riverflow paths and billabongs - highest value. ▪ Landslope less than 2% frequently contain waterlogged soils and wetland plant communities. These areas also occur on drainage lines and floodplains. Silt deposition occurs freely on such floodplains and areas immediately adjacent to floodways where water velocities decrease or mix with stored water. ▪ Landslope between 2-4% (moderate importance). ▪ Slopes greater than 4% have less importance as they create higher velocity flows and have a lower capability to collect silt and nutrients (low value).
	Relationship of the area to land use.	Wetland Management Areas which are located downstream of land uses which have the potential to generate higher pollutant loads are likely to provide a more substantive role than lands which are located in catchments with low pollutant generation characteristics (eg. natural bushland).

Values and Functions	Attributes	Element Assessment
Wetland Buffers	Lands identified by the wetland management area often play an important role in buffering wetlands or smaller wetland remnants.	A diversity of wetland buffer issues and considerations exist within wetland management areas, some of these functions are outlined below: ▪ The wetland areas contain non-wetland vegetation in areas adjacent to core wetland habitat. The management of these areas is often crucial in maintaining conservation values within core wetland areas. ▪ The width of the buffer zone depends on a number of factors, such as vegetation type, intensity of surrounding land uses, potential for weed invasion, slope and management strategies. ▪ Low lying areas, such as remnant areas of wetland vegetation in drainage depressions often provide important buffering functions for downstream areas.
Core wetland areas are generally zoned E2 – Environmental Protection and some areas are also affected by State Environmental Planning Policy No 14 – Coastal Wetlands. A number of other smaller wetland types or modified ecosystems have important conservation values.	Some of the wetland types which occur within the wetland management areas are: ▪ Large areas of wetland habitat ▪ Remnant wetlands ▪ Drainage lines ▪ Wet meadows ▪ Drainage depressions	**Large Areas of Wetland Habitat** These areas are protected by the E2 – Environmental Protection Zone under WLEP 2011. **Remnant Wetlands** Wetland vegetation which is less than one (1) hectare in size generally occur in wetland management areas. These small wetlands also possess a number of conservation values which must be considered in the development process. **Drainage Lines** Wyong Shire's floodplains often contain drainage channels which contain narrow bands of wetland or riparian vegetation. These bands of vegetation often play an important role in providing habitat linkages between isolated areas of wetland vegetation. **Wet Meadows** Wet meadows resemble pastures and are characterised by the presence of poorly drained soils. These areas may have contained wetland vegetation which has been converted to pasture by historic agricultural pursuits. Extensive areas of wet meadow are included within the Wetland Management Areas. These areas frequently occupy low lying positions in floodplains and provide important feeding areas for wetland birds. **Drainage Depressions** Wyong's floodplains contain channel-form remnants of past flow paths or temporary lagoons. These lands often contain small wetlands which provide habitat for amphibians and have some value for wetland birds.

Values and Functions	Attributes	Element Assessment
Conservation Values	Some of the attributes which are important in defining the conservation value of lands within the wetland management area include: ▪ Alteration ▪ Special features ▪ Representativeness ▪ Biological diversity and habitat importance	**Alteration** The conservation value of a wetland can be reduced by human modifications such as clearing, grazing, excessive nutrient or sediment input. These types of disturbance should be identified in order to provide information on the degree that the wetland has been altered. **Special Features** ▪ Habitat or likely habitat of endangered or threatened plants and animals ▪ Whether the wetland is classified as an Endangered Ecological Community ▪ Presence of animal or plant communities which are regionally or locally uncommon ▪ The wetland plays a role in filtering runoff flows from the catchment before entering environmentally sensitive areas **Representativeness** The extent to which the particular wetland community occurs locally and its conservation status. **Biological Diversity and Habitat Importance** The biological value of the wetland depends on many factors such as the size of the wetland, length to width ratio, proximity to other areas of vegetation, diversity of flora and fauna.