Byron Shire Development Control Plan 2014

Chapter C2

Areas Affected by Flood

BYRON SHIRE COUNCIL

Contents

Maps

Figures

Tables

Document History

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C2.1 Introduction

C2.1.1 Purpose of this Chapter

The purpose of this Section is to identify requirements relating to development on **flood liable land** that is appropriate to the degree of flood hazard on that land.

C2.1.2 Objectives of this Chapter

The Objectives of this Chapter are to:

1. Support and implement the objectives and provisions of Byron LEP 2014 relating to development on land at or below the relevant **flood planning level**.
2. Provide a holistic approach to managing development on **flood liable lands**;
3. Ensure development maintains the existing flood regime and flow conveyance capacity;
4. Consider the future projected impacts of climate change on the floodplain in accordance with Council's adopted Climate Change Strategic Planning Policy;
5. Reduce the impact of flooding and flood liability on individual owners and occupiers;
6. Reduce public and private losses resulting from flooding;
7. Encourage the development of and use of land in a manner compatible with the flood hazard.

An underlying principle of this Chapter is that any new development or modifications to existing development should always, as far as practical, result in an improvement to the existing flood risk and in no circumstances should the flood risk be made worse.

C2.1.3 Application of this Chapter

The planning provisions of this Chapter apply to all land at or below the **future flood planning level**. The **flood planning matrix** (Table C2.1) contains more specific information about the nature and types of development controlled by this DCP Chapter.

C2.1.4 Planning Objectives and Development Controls

The provisions of this Chapter are based on a range of control measures in relation to particular development/building types. Development proposals must be consistent with the planning objectives for the Chapter. Such consistency is typically demonstrated by compliance with the identified development controls, although there may be circumstances

where an alternative to the application of a development control is consistent with the planning objectives. Such alternatives will be considered with regard for risk management.

C2.1.5 Relationship to Byron LEP 2014

This Chapter provides more detailed development controls to enable the effective implementation of the following clauses in Byron LEP 2014:

Clause 6.3 Flood planning

Clause 6.4 Floodplain risk management

C2.1.6 Climate Change and Flood Planning

The Byron Shire Council Climate Change Strategic Planning Policy ('Policy') sets out Council's accepted climate change parameters to inform the decision making process for strategic, infrastructure and operational planning. The flood planning provisions in this Chapter have been developed having regard to the overall framework of that Policy.

C2.1.7 Relationship to other Chapters in this DCP

This Chapter needs to be read in conjunction with Chapters D1 Residential Development in Urban and Special Purpose Zones, D2 Residential Accommodation and Ancillary Development in Rural Zones, D3 Tourist Accommodation, D4 Commercial and Retail Development, D5 Industrial Development and D6 Subdivision, for development on land at or below the **future flood planning level**. The provisions in this Chapter prevail over the provisions of other Chapters, unless otherwise specified, where there is an inconsistency.

C2.1.8 Background Information

Council has carried out a number of Flood Studies, the latest of which are set out in section 2.3.1.

The studies for Belongil Creek, Marshalls Creek and Tallow Creek have all acknowledged climate change and Council's Climate Change Strategic Planning Policy, but have been based on different climate change parameters.

The above studies along with Council's Climate Change Strategic Planning Policy are the principal reference documents for implementing the provisions of this Chapter.

C2.2 General Assessment Criteria

1. Council will not consent to any development on land at or below the **flood planning level** if there is sufficient suitable area on that land above the **flood planning level** on which to carry out the development.

2. Where the development is on land below the **flood planning level**, floor levels of any buildings must be constructed at or the above the **flood planning level**. Council will not support filling beneath the building footprint of the proposed development unless it

is demonstrated that it will not adversely impact on the floodplain. Filling outside the building footprint generally will not be permitted, other than for driveways and/or pedestrian pathways immediately adjoining the walls of the building.

3. Where extensive additions are proposed to lightweight buildings (e.g. timber, fibro) the applicant should consider redesigning the whole building to comply with current flood planning controls.

4. The adaptability of the development in the face of climate change will be considered as part of the development process. Adaptable developments have the ability to be designed to the **Projected 2050 Flood Planning Level** instead of the **Projected 2100 Flood Planning Level** in most instances.

C2.3 Development Controls

The following steps should be taken to ascertain the flood planning controls relating to development on land at or below the **future flood planning level**:

Step 1 Consider the applicable Flood Study for the catchment in which the land is situated, in relation to flood hazard and floor level requirements (Section C2.3.1).

Step 2 Consider the specific Flood Planning provisions for the type of development and flood hazard as set out in the **flood planning matrix** (Table C2.1 below).

Step 3 Consider any special requirements or standard designs for particular localities (Section C2.3.5).

Note: If no applicable study exists (Step 1 above), applicants shall refer to the relevant flood planning requirements set out in Council's Climate Change Strategic Planning Policy and in Section C2.3.2 and Section C2.3.5 below (as applicable); then return to Step 1 upon completion of a study.

A flow chart illustrating the process for determining flood planning controls on land at or below the **future flood planning level** is included at the end of Section C2.3.1 below (Figure C2.1).

C2.3.1 Applicable Flood Study

The following catchment-based flood studies are relevant:

1. Belongil Creek Catchment

   a) Belongil Creek Flood Study (2009)

      i) includes Byron Bay township and industrial estate, West Byron and Sunrise estate. The extent of the Belongil Creek catchment is shown in Map C2.1.

   b) Belongil Creek Floodplain Risk Management Study & Plan (in preparation)

APPLICATION:

Until such time as the *Belongil Creek Floodplain Risk Management Study & Plan* is adopted, the following climate change scenarios in the Belongil Creek Flood Study (2009) shall apply:

- 2050 Climate Change scenario shall be used for the 2050 Climate Change planning horizon.
- 2100 Climate Change scenario shall be used for the 2100 Climate Change planning horizon.

2. Brunswick River Catchment

a) Brunswick River Flood Study (1986)

i) includes Mullumbimby and Brunswick Heads. The extent of the Brunswick River catchment is shown in Map C2.2.

Note: this document does not include a climate change assessment; refer to Council's *Climate Change Strategic Planning Policy* for **flood planning level** methodology and requirements.

b) North Byron Coastal Creeks Flood Study (in preparation)

i) includes Mullumbimby, Brunswick Heads, Ocean Shores, New Brighton, South Golden Beach and Billinudgel.

ii) the study area for the North Byron Coastal Creeks Flood Study combines the Brunswick River, Marshalls Creek and Simpsons Creek catchments. The extent of the North Byron Coastal Creeks catchment is shown in Map C2.3.

c) North Byron Coastal Creeks Floodplain Risk Management Study & Plan (planned to commence in future)

APPLICATION:

Until such time as the *North Byron Coastal Creeks Flood Study* is adopted, the **Projected 2050 Flood Planning Level** applies as follows:

- where the site of the development is at or below 4m AHD, an additional 0.4m shall be applied to the estimated 1 in 100 year flood level, in addition to the normal 0.5m freeboard.
- where the site of the development is above 4m AHD, the estimated 1 in 100 year flood level shall be used, together with the normal 0.5m freeboard .

3. Marshalls Creek Catchment

a) Marshalls Creek Floodplain Management Plan (1997)

b) Tweed – Byron Coastal Creeks Flood Study (2010)

c) Tweed – Byron Coastal Creeks Flood Study BSC Climate Change Assessment (2010)

i) includes Ocean Shores, New Brighton, South Golden Beach and Billinudgel. The extent of the Marshalls Creek catchment is shown in Map C2.4.

d) North Byron Coastal Creeks Flood Study (in preparation)

i) refer to Brunswick River catchment

APPLICATION:

Until such time as the *North Byron Coastal Creeks Flood Study* is adopted, the following climate change scenarios shall apply:

- 2050 Climate Change scenario shall be used for the 2050 Climate Change planning horizon.
- 2100 Climate Change scenario shall be used for the 2100 Climate Change planning horizon.

4. Tallow Creek Catchment

a) Tallow Creek Flood Study (2002)

b) Tallow Creek Floodplain Risk Management Study and Plan (2009)

i) includes Suffolk Park, and the estates of Byron Hills and Baywood Chase. The extent of the Tallow Creek catchment is shown in Map C2.5.

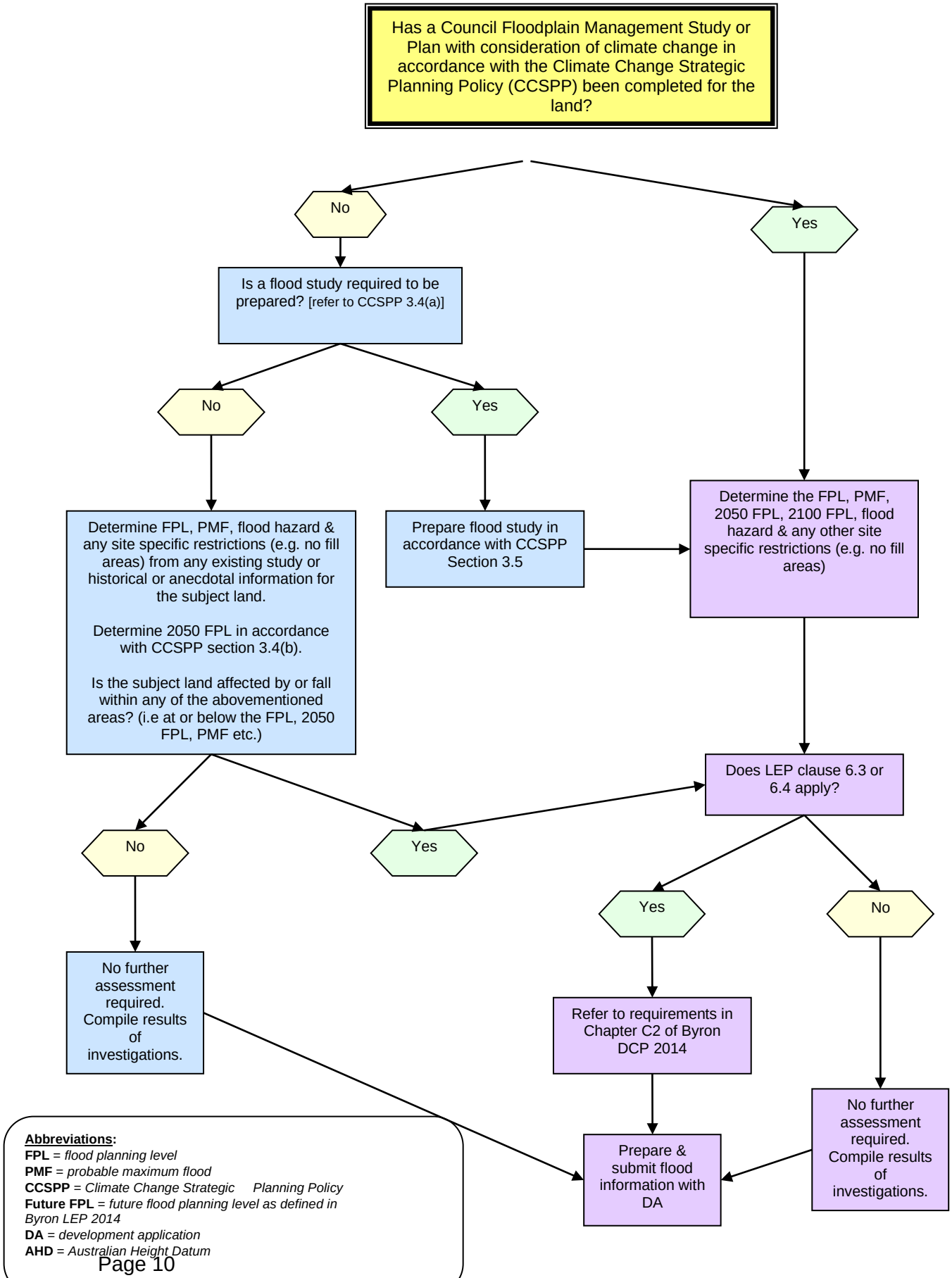
ii) applies until superseded by a more current flood study and management plan for this catchment:

APPLICATION:

In the absence of more updated flood mapping for this catchment, the following climate change scenarios in the *Tallow Creek Floodplain Risk Management Study and Plan* shall apply:

- 2050 Climate Change scenario shall be used for the 2050 Climate Change planning horizon.
- 2100 Climate Change scenario shall be used for the 2100 Climate Change planning horizon.

Figure C2.1 – Flow chart illustrating process for determining flood planning controls on land at or below the future Flood Planning Level



C2.3.2 Minimum Floor Levels

1. The finished floor level of **habitable rooms** must be above the relevant level defined by the **flood planning matrix**. Analysis and certification by a suitably qualified structural engineer will be required where the finished floor level of enclosed 'non-habitable' rooms is more than 1.0 metre below the 1:100 year flood level.

2. Developments in **new release areas**, certain rezoning proposals, **critical facilities** and **special purpose facilities** requiring a longer flood planning horizon are generally required to achieve the **Projected 2100 Flood Planning Level.**

3. New dwellings in existing residential areas are generally required to achieve the **Projected 2050 Flood Planning Level**. Adaptable building design is encouraged so that dwellings on piers, posts, columns or piles can be raised in future to accommodate climate change. Where concrete slab on ground is necessary the slab level shall be finished at least 300mm above the surrounding ground, as well as achieve the **Projected 2050 Flood Planning Level**.

4. Commercial and Industrial floor levels are generally required to achieve the **Projected 2050 Flood Planning Level**. Where this cannot occur, Council will consider flood proofing and emergency storage above the **Projected 2050 Flood Planning Level** to minimise damage that may occur during flooding (refer to sections C2.3.4 Flood Proofing and C2.3.5 Special Provisions).

C2.3.3 Flood Planning Matrix

The **flood planning matrix** below sets out general planning requirements for "low / intermediate" and "high" hazard flood categories. The flood affectation or hazard of a property or part of a property may change when considering climate change.

To satisfy the provisions of the LEP, developments must not only demonstrate compliance with the *Primary Constraints* in the **flood planning matrix** but must also demonstrate compliance with the *Additional Constraints*. The primary constraints relate to land to which LEP clause 6.3(3) applies (i.e. land at or below the **flood planning level**), while additional constraints relate to land to which LEP clause 6.3(4) applies (i.e. land at or below the **future flood planning level**).

The **flood planning matrix** will not prevail over any special provisions set out in Section C2.3.5.

Table C2.1 – Flood Planning Matrix

CONTROLS	DEVELOPMENT / BUILDING TYPE	Primary Constraints[1] Existing Climate Flood Hazard Categories			Additional Constraints[1] Future/Extreme Event Flood Hazard Categories	
		No Hazard	**Low/Intermediate Hazard**	**High Hazard**	**2100 Climate Change Planning Horizon - 100 Year Low/Intermediate Hazard**	**2100 Climate Change Planning Horizon - 100 Year High Hazard**
Land Use	Development in **New Release Areas**, unless separately defined below	N/A	SF2		SF2	SF2
Suitability & Fill Level	Development in all other areas unless separately defined below	N/A	SF1		SF1	SF1
	Non-Habitable Building or Room (e.g. shed, carport, garage, toilet, laundry, shelter, etc)	N/A	SF1	SF1	SF1	SF1
	Emergency Services **Critical Facilities** Site (Hospitals, etc.)	N/A	SF3a		SF3a	
	Other **Special Purpose Facilities** (School, etc.)	N/A	SF3b		SF3b	
Floor Level	Development in **New Release Areas** unless separately defined below	FL3	FL3		FL3	FL3
	Development in all other areas unless separately defined below	FL2	FL2		FL2	FL2
	Dwelling Additions, except in **New Release Areas**	N/A	FL4		FL4	FL4
	Non-Habitable Building or Room (e.g. shed, carport, garage, toilet, laundry, shelter, etc)	N/A	FL1		FL1	FL1
	New **Critical Facilities** (Hospitals, etc.) or **Special Purpose Facilities** (School, etc.)	FL3a	FL3a		FL3a	

Table C2.1 – Flood Planning Matrix

CONTROLS	DEVELOPMENT / BUILDING TYPE	Primary Constraints[1] Existing Climate Flood Hazard Categories			Additional Constraints[1] Future/Extreme Event Flood Hazard Categories	
		No Hazard	**Low/Intermediate Hazard**	**High Hazard**	**2100 Climate Change Planning Horizon - 100 Year Low/Intermediate Hazard**	**2100 Climate Change Planning Horizon - 100 Year High Hazard**
Building Components	All	N/A	BC1		BC1	BC1
Structural Soundness	Ancillary Building (e.g. shed, carport)	N/A	SS1	SS1	SS1	SS1
	Other Building	N/A	SS1	SS2	SS1	SS1
Flood Effect	Development in **New Release Areas**, unless separately defined	N/A	FE2		FE2	FE2
	Development in all other areas unless separately defined below	N/A	FE2		FE1	FE2
	Alterations and Additions, Non-Habitable Building or Room (e.g. shed, carport, garage, toilet, laundry, shelter, etc)	N/A	FE1		FE1	FE1
	Other Developments (road raising, etc)	N/A	FE3	FE3	FE3	FE3
Evacuation & Access	Development in all other areas unless separately defined below	N/A	EA1		EA1	EA1
	Development in **New Release Areas**, unless separately defined	N/A	EA2		EA2	EA2
	Critical Facilities (Hospitals, etc.)	N/A	EA3a		EA3a	
	Other **Special Purpose Facilities** (Schools, etc.)	N/A	EA3b		EA3b	

1. **Refer to relevant flood study for definition of hazard categories**

Table C2.1 – Flood Planning Matrix						
CONTROLS	**DEVELOPMENT / BUILDING TYPE**	**Primary Constraints[1]** Existing Climate Flood Hazard Categories			**Additional Constraints[1]** Future/Extreme Event Flood Hazard Categories	
		No Hazard	**Low/Intermediate Hazard**	**High Hazard**	**2100 Climate Change Planning Horizon - 100 Year Low/Intermediate Hazard**	**2100 Climate Change Planning Horizon - 100 Year High Hazard**
N/A	Controls Not Applicable					
	Unsuitable Land Use - Not considered suitable for development					
CONTROL MEASURES						
SF1	**LAND USE SUITABILITY & MINIMUM FILL LEVEL** Consider for development subject to the controls below. No minimum fill level required.					
SF2	Consider for development subject to the controls below. For new residential, commercial and industrial release areas, the minimum fill level to be greater than or equal to the 1:100 ARI (average recurrent interval) flood event plus projected climate changes allowances for the year 2100					
SF3a	Consider for development subject to the controls below. Where possible Emergency Services should be located on land currently flood free during the **PMF** event. Where practical the minimum fill level should be greater than or equal to the existing climate **PMF** flood level.					
SF3b	Consider for development subject to the controls below. Council to give consideration on the benefits of using the development during and after a flood emergency. existing climate **PMF** flood level.					
FL1	**MINIMUM FLOOR LEVEL** All floor levels to be greater than or equal to the 5% AEP flood level.					

Table C2.1 – Flood Planning Matrix

CONTROLS	DEVELOPMENT / BUILDING TYPE	Primary Constraints[1] Existing Climate Flood Hazard Categories			Additional Constraints[1] Future/Extreme Event Flood Hazard Categories	
		No Hazard	**Low/Intermediate Hazard**	**High Hazard**	**2100 Climate Change Planning Horizon - 100 Year Low/Intermediate Hazard**	**2100 Climate Change Planning Horizon - 100 Year High Hazard**
FL2	All floor levels to be greater than or equal to the ***Projected 2050 Flood Planning Level*** (FPL2).					
FL3	All floor levels to be greater than or equal to the ***Projected 2100 Flood Planning Level*** (FPL3).					
FL3a	If practical, all floor levels to be greater than or equal to the ***Projected 2100 Flood Planning Level*** (FPL3), so that these buildings will be available for accommodation / storage during and after a flood emergency.					
FL4	Floor levels to be as close to the *minimum floor level* above (FPL2) as practical and not less than the floor level of the existing building being extended if the existing floor level is less than or equal to the minimum floor level. If the extended weatherproof area exceeds 50% of the existing weatherproof area, the extension is treated as a new building. The extended weatherproof area is measured as the cumulative area of any previous extensions plus the proposed extension. If building is identified as being suitable for voluntary house raising scheme, Council to discuss potential house raising with owner.					
BC1	**BUILDING COMPONENTS** Buildings to have **flood compatible material** below the relevant ***flood planning level*** according to development/building type. Refer to Flood Proofing Section.					
SS1	**STRUCTURAL SOUNDNESS** No structural soundness requirements for the force of floodwater, debris & buoyancy. Must still comply with Building Code of Australia requirements.					
SS2	Engineers report to prove that structures subject to a flood up to the 100 year event can withstand the force of floodwater, debris & buoyancy.					
FE1	**FLOOD EFFECT** No action required					

Table C2.1 – Flood Planning Matrix						
CONTROLS	**DEVELOPMENT / BUILDING TYPE**	**Primary Constraints[1]** Existing Climate Flood Hazard Categories			**Additional Constraints[1]** Future/Extreme Event Flood Hazard Categories	
		No Hazard	**Low/Intermediate Hazard**	**High Hazard**	**2100 Climate Change Planning Horizon - 100 Year Low/Intermediate Hazard**	**2100 Climate Change Planning Horizon - 100 Year High Hazard**
FE2	The flood impact of the development to be considered by Council, with Council having the right to request an engineer's report (see FE3 below)					
FE3	Engineers report required to prove that the development will not result in adverse flood impact elsewhere					
EA1	**EVACUATION/ACCESS** Council to provide information on flood evacuation strategy					
EA2	Site specific Flood Evacuation Strategy be developed consistent with Council / SES overall Flood Evacuation Strategy.					
EA3a	Emergency service site - should have good access up to the **PMF** and preferably not cut-off from the main residential area(s). Council to evaluate suitability of site in this respect.					
EA3b	If site to be used during and after a flood emergency (see FL3a above), should have good access up to the **PMF** and preferably not cut-off from the main residential area(s).					

C2.3.4 Flood Proofing

1. **Flood Compatible Material**

Materials located below the relevant level defined by the **flood planning matrix** must be capable of resisting damage, deterioration, corrosion or decay taking into account the likely time the material would be in contact with flood water and the likely time it would take for the material to subsequently dry out.

2. Services

Services and related equipment, other than electricity meters, must not be located below the relevant flood planning level defined by the **flood planning matrix** unless they have been designed specifically to cope with flood water inundation. The location of electricity meters is regulated by the electricity supply authority.

Unless the electricity supply authority determines otherwise, electrical switches must be placed above the relevant level defined by the **flood planning matrix**. Electrical conduits and cables installed below the relevant level defined by the **flood planning matrix** must be waterproofed or placed in waterproof enclosures.

3. Enclosures

Any enclosure located below the relevant level defined by the **flood planning matrix** must have openings to allow for automatic entry and exit of floodwater for all floods up to the relevant level defined by the **flood planning matrix**.

C2.3.5 Special Provisions

1. CBD infill development

For infill development in a commercial centre, change of use and additions to existing commercial premises, the current floor level (compatible with the footpath level) can be retained. However buildings must comply with section C2.3.4 Flood Proofing.

2. New Brighton, South Golden Beach and Billinudgel

Dwellings in this area are subject to frequent low level flooding.

Refer to Councils Marshalls Creek Floodplain Management Plan (1997) for land that cannot be filled. Preferable building type is on piers, with car parking located under, and with under floor area to remain clear of infill construction. The area shall not be used for storage, nor infilled at a later date.

3. Tallow Creek Flood Study Catchment (Map C2.5)

This study found that buildings / dwellings should be 0.5m above the 2100 Climate Change flood levels.

Refer to the Tallow Creek Floodplain Management Plan (2009) for land that cannot be filled. Preferable building type is on piers, with car parking located under, and with under floor area to remain clear of infill construction. The area shall not be used for storage, nor infilled at a later date.

4. Bangalow

Council does not currently have any adopted flood studies or management plans for Bangalow. Where development is proposed on land that is or may be considered at or below the **flood planning level**, the applicant will be required to submit a report using local flood information to satisfy the provisions in the **flood planning matrix**. In some instances a professional Civil / Hydraulic Engineer (with qualifications suitable for admission as a corporate Member of Engineers Australia) will be required to prepare this report or a flood study (Refer to Section B3.2.3 of Chapter B3 Services for further guidance).

Local flood information could be anecdotal flood heights (i.e. highest recorded flood height) or flood studies carried out for previous rezoning or large development applications.

5. Basement **Car Parks**

Any basement **car park** shall incorporate design elements (e.g. ramps etc) or automatic mechanisms (e.g. hydraulic barriers etc) to prevent the ingress of flood waters. The design elements or mechanisms are to comply with at a minimum the **Projected 2050 Flood Planning Level**. The basement shall also include facilities for the pumping of water in the event of failure, or larger flood events.

6. Rural Areas

Council does not hold plans or records for flooding in most rural areas, other than in the defined catchments (refer to Section C2.3.1). In certain rural areas, floodplains may be steep and narrow, and are liable to rapid flood inundation with little warning.

In the absence of current flood information, persons proposing new developments in rural areas near rivers, streams and gullies that could be flood liable should seek out and use reliable local historical information. Catchment flood studies may be required to establish design flood levels, flow rates for structural design, and to assess the potential impact of the development on local flood behaviour. Refer to Section B3.2.3 of Chapter B3 Services for further guidance.

Where development is proposed on rural land that may be considered **flood liable land**, the applicant will be required to submit a report using local flood information, establishing the levels on the site equivalent to the **Projected 2050 Flood Planning Level** in relation to any dwelling, residential, tourist or commercial project. In some instances a professional Civil / Hydraulic Engineer (with qualifications suitable for admission as a corporate Member of Engineers Australia) will be required to prepare this report or a flood study.

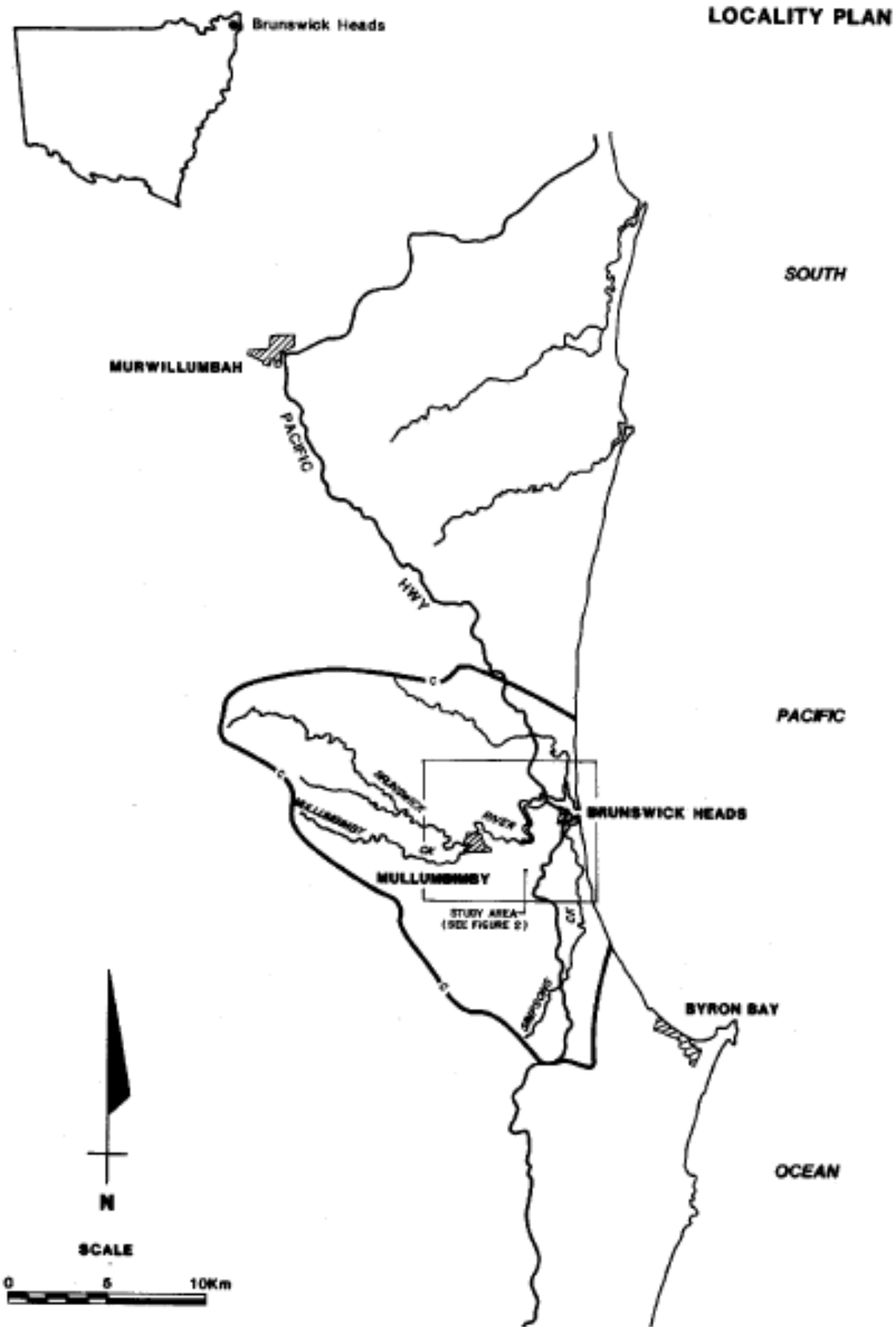
The floor level of any **dwelling** shall be at or above the **Projected 2050 Flood Planning Level** while the floor level for other types of development will be determined on a case-by-case basis.

Map C2.1 – Belongil Creek Flood Study Area Locality Plan

Figure 1
Locality Plan

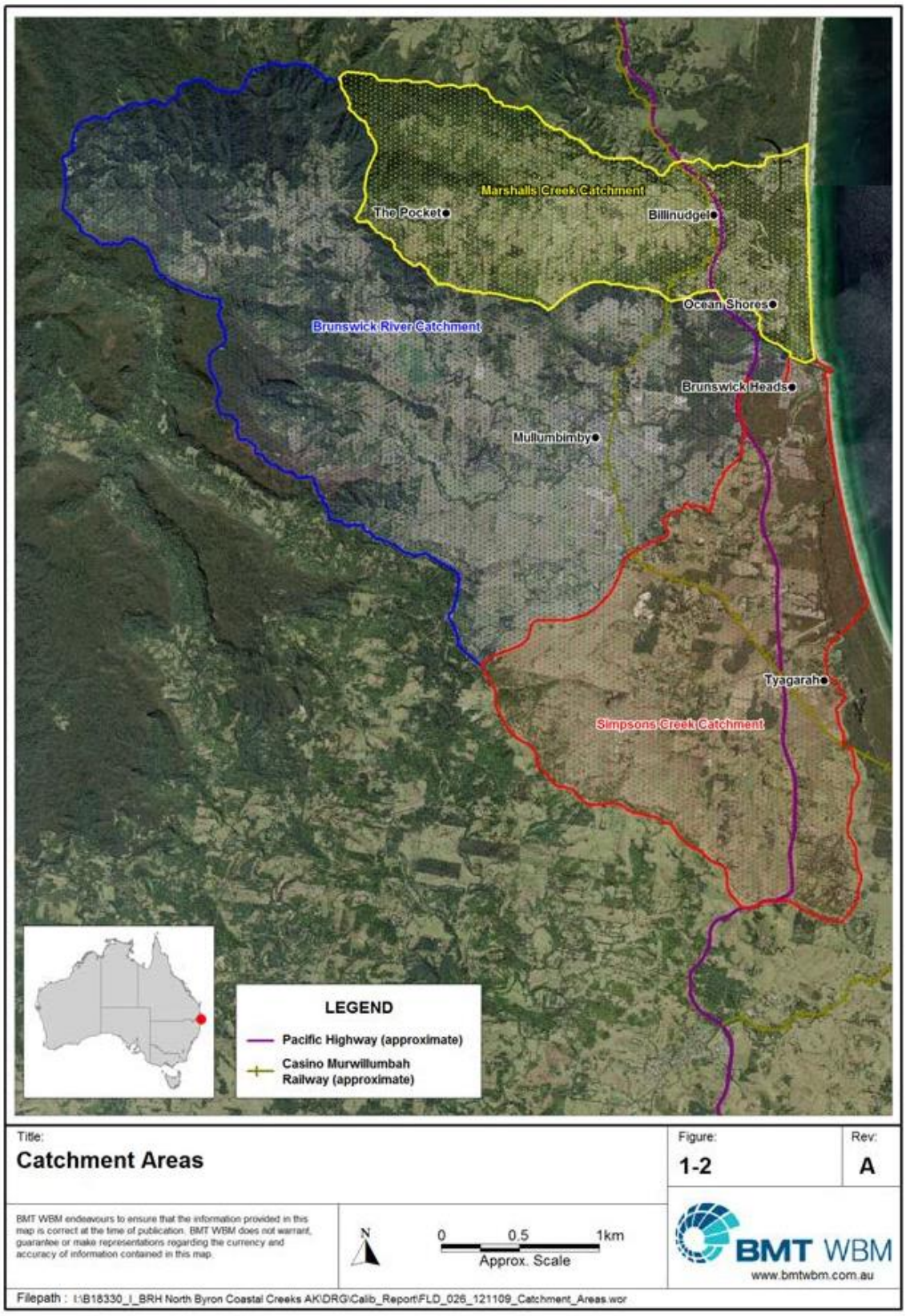
Source: Belongil Creek Flood Study (2009)

Map C2.2 – Brunswick River Flood Study Area Locality Plan



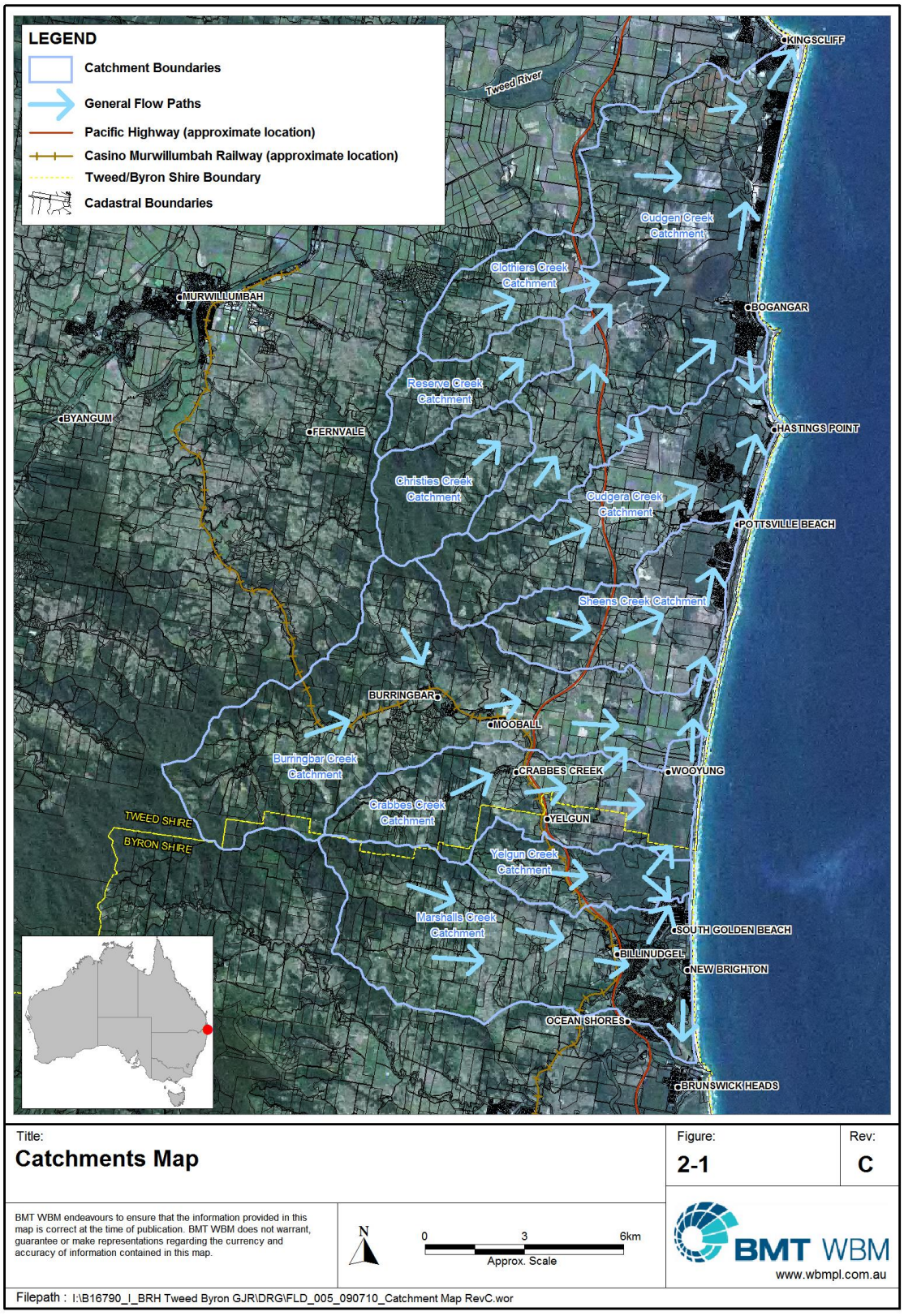
Source: Brunswick River Flood Study (1986)

Map C2.3 – North Byron Coastal Creeks Flood Study Area Locality Plan



Source: North Byron Coastal Creeks Flood Study - Model Calibration (2013)

Map C2.4 – Marshalls Creek Flood Study Area Locality Plan



Source: Tweed – Byron Coastal Creeks Flood Study (2010)

Map C2.5 – Tallow Creek Flood Study Area Locality Plan

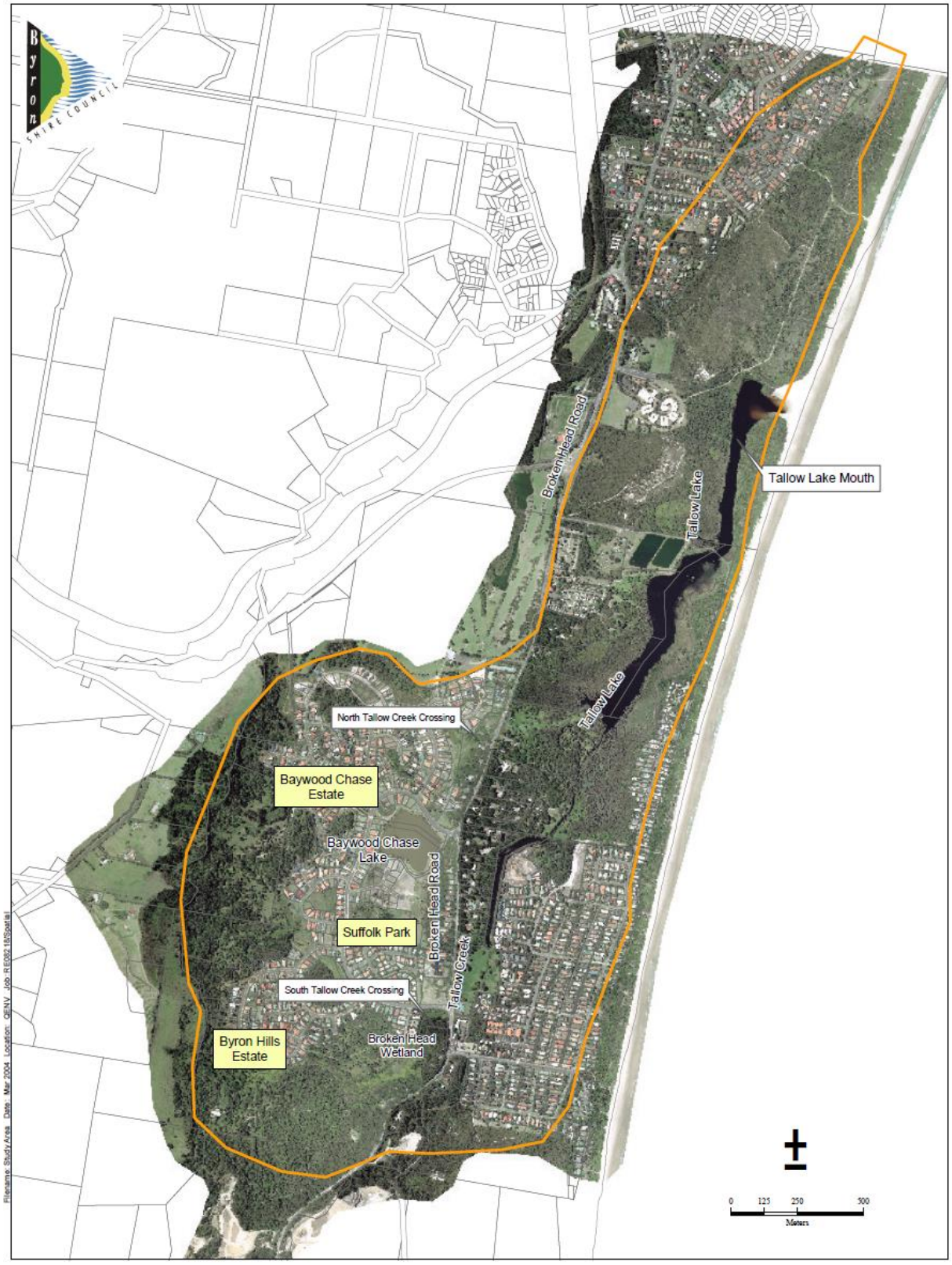


Figure 3-1:Tallow Creek Flood Risk Management Study - Study Area

Tallow Creek Catchment

Source: Tallow Creek Floodplain Risk Management Study and Plan (2009)