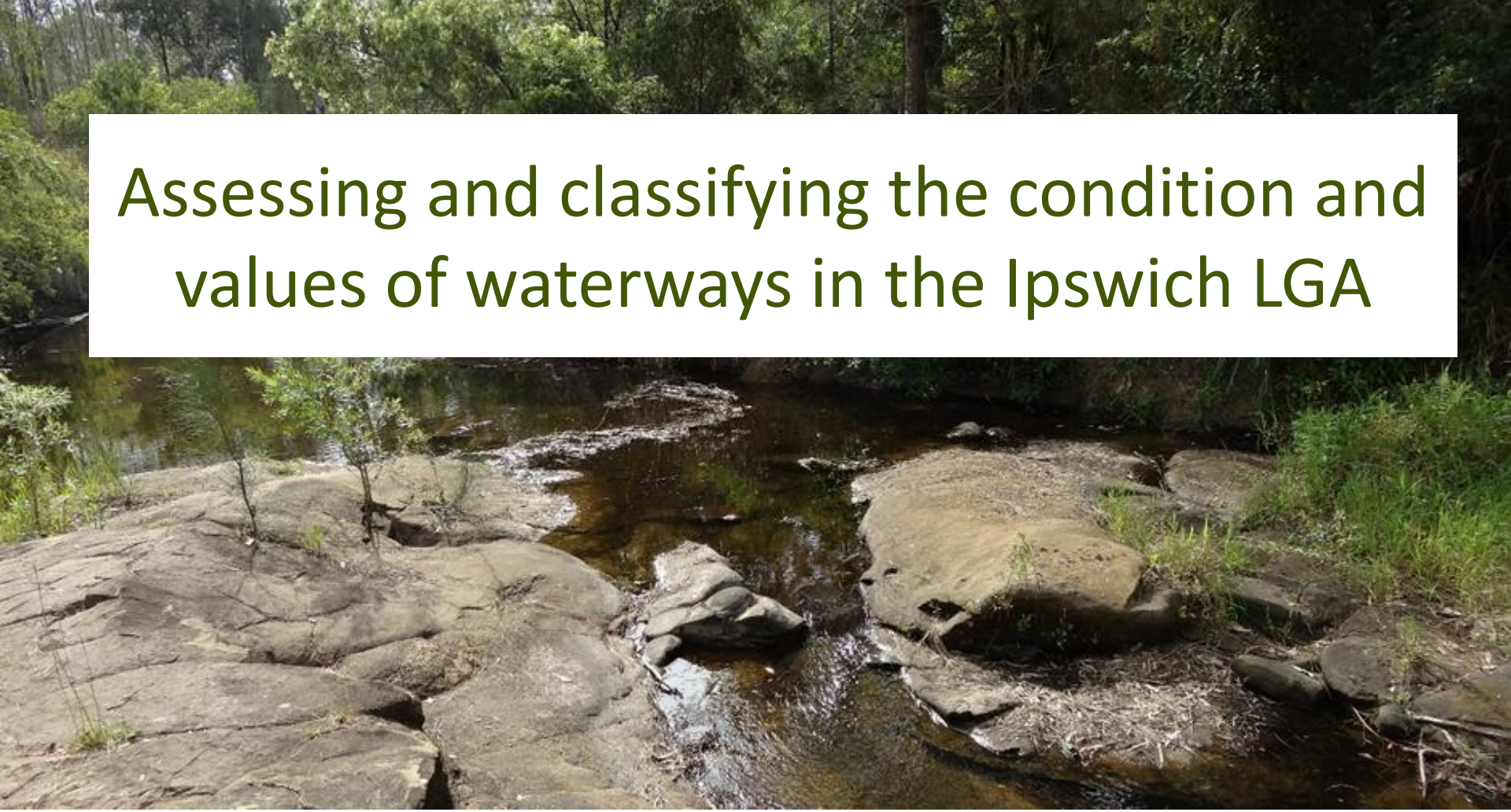

Assessing and classifying the condition and values of waterways in the Ipswich LGA

ICC EnviroForum 2015

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City of Ipswich

alluvium

Project introduction

Objectives

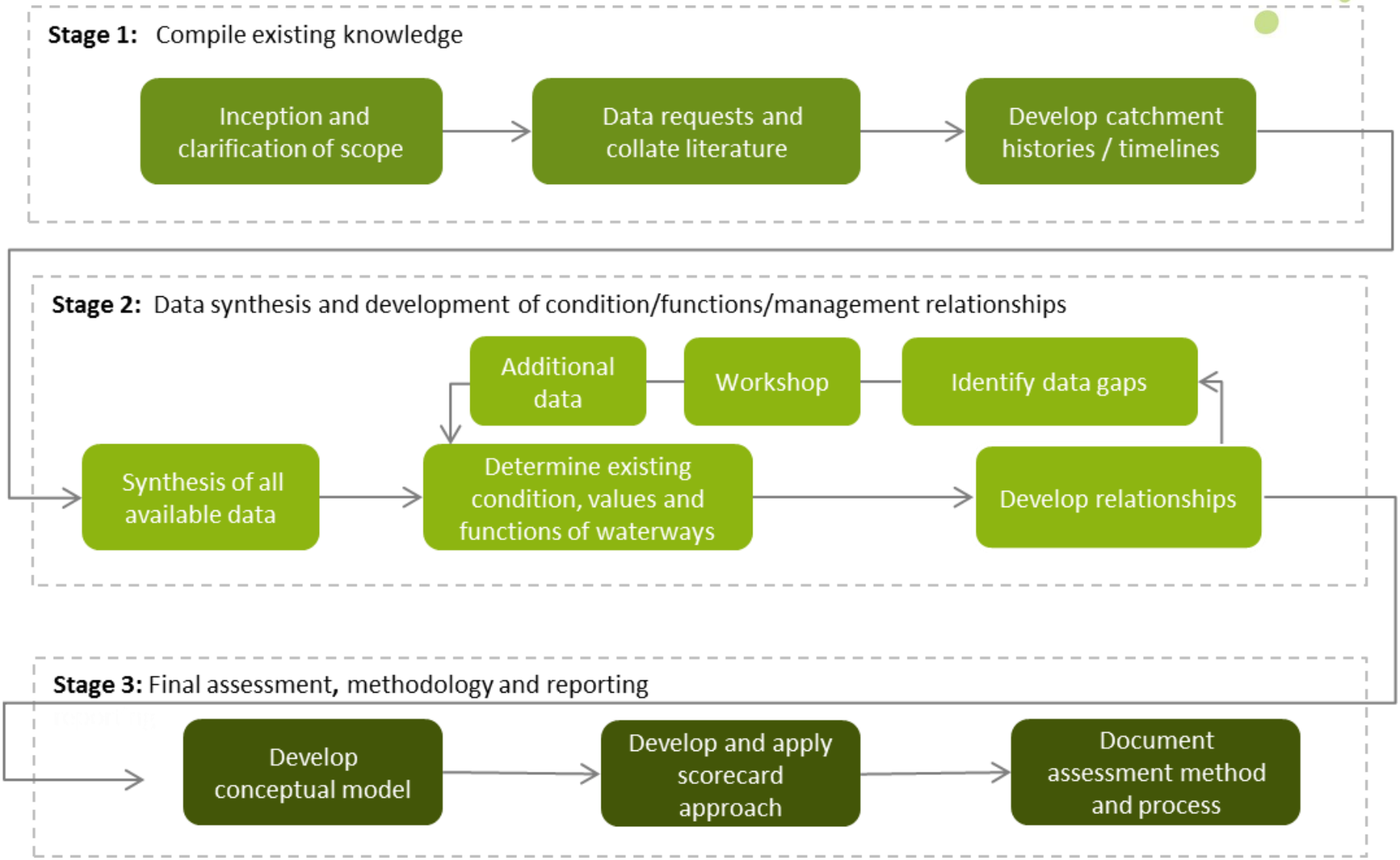
- To collect & synthesise relevant information and data to inform the review of Council's Waterway Health Strategy
- To improve Council's understanding of waterways at a sub-catchment level
- To help inform other key council projects and initiatives:
  1. The classification, protection and enhancement of locally significant waterways and/or reaches
  2. Future investment in catchment and riparian management
  3. Prioritisation and delivery of water quality offsets

Overview

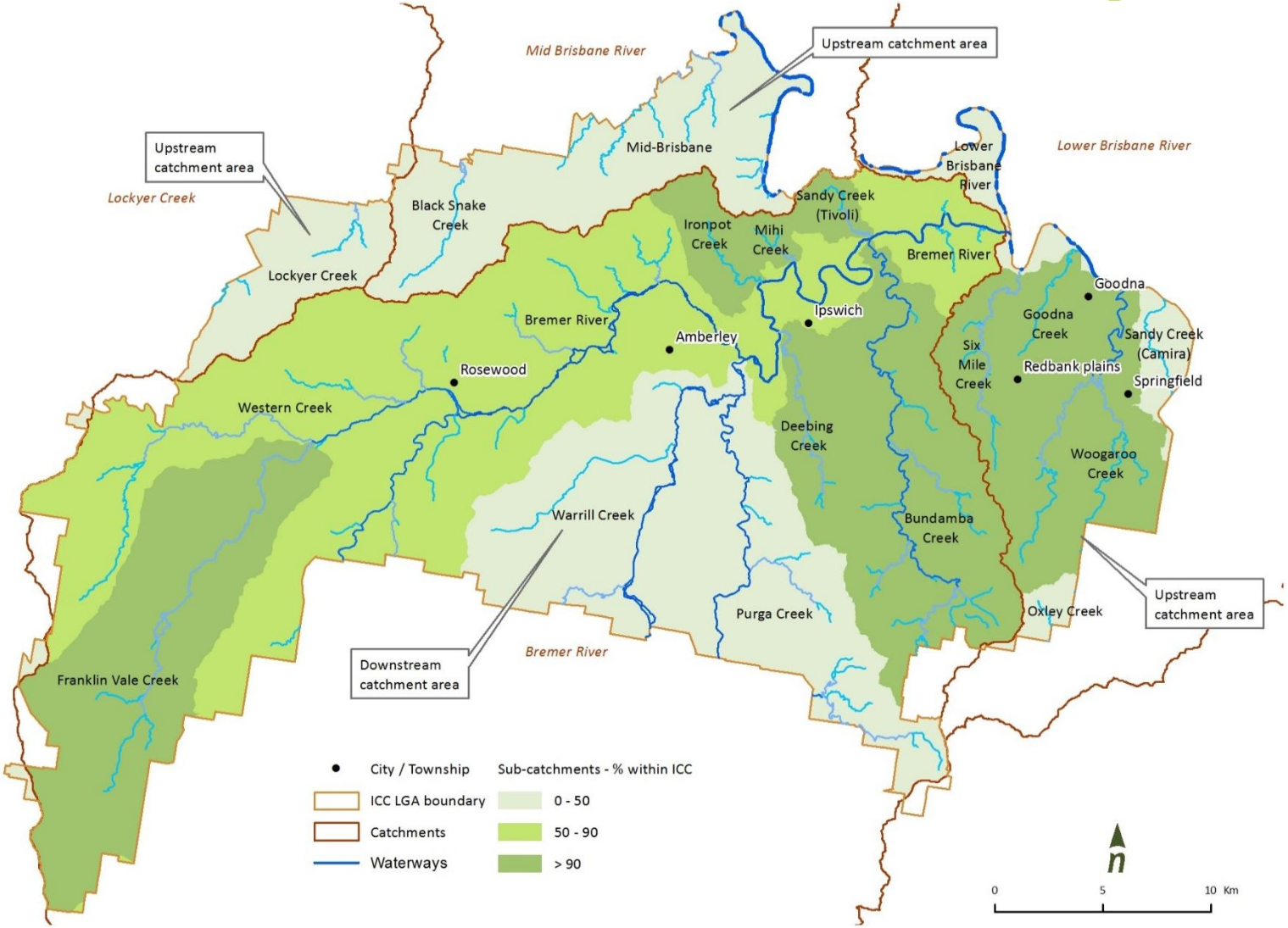
Scope

- Collate evidence base for current condition of waterway values and potential threats
- Identify additional data requirements
- Develop tools to assess waterway health

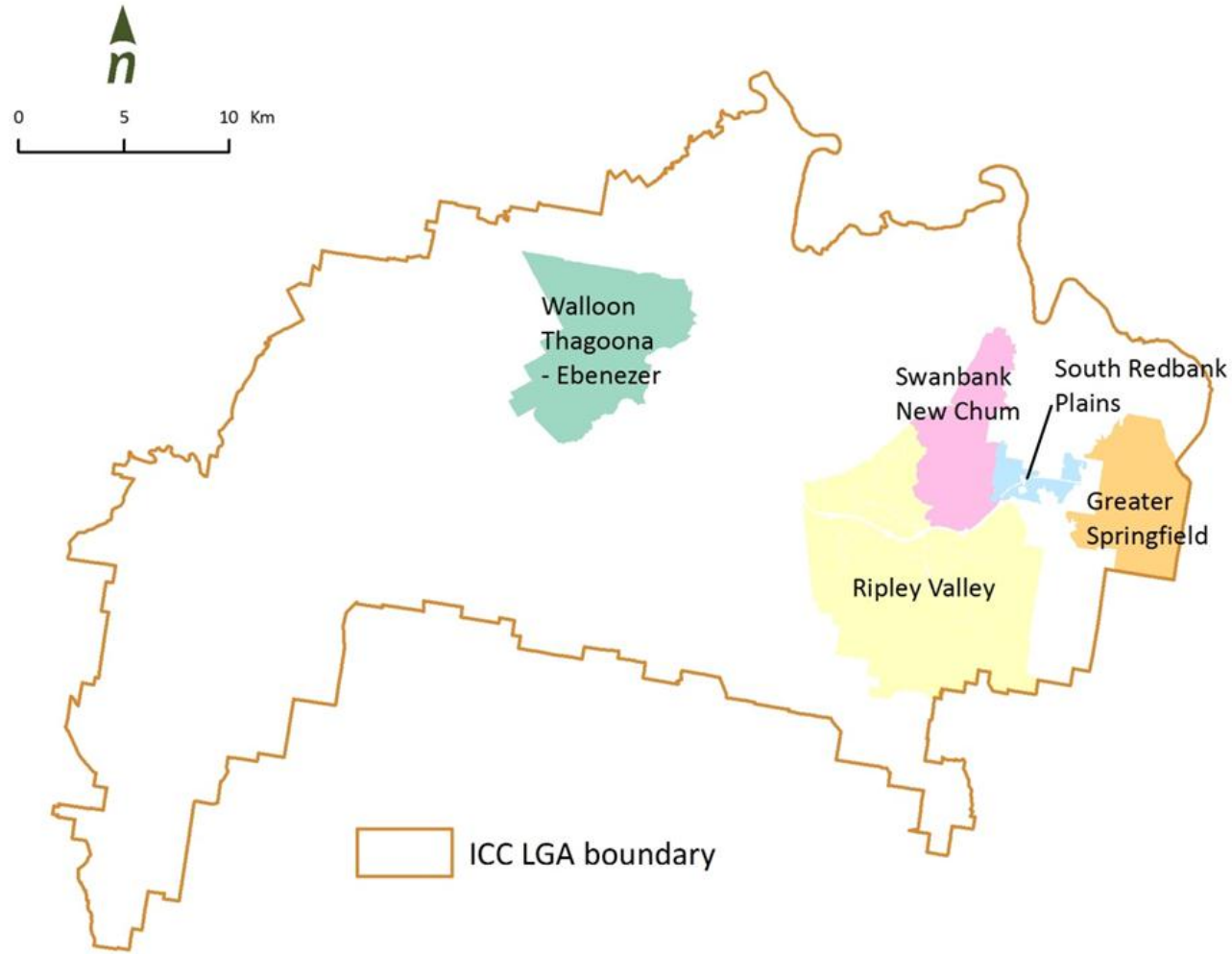
Approach

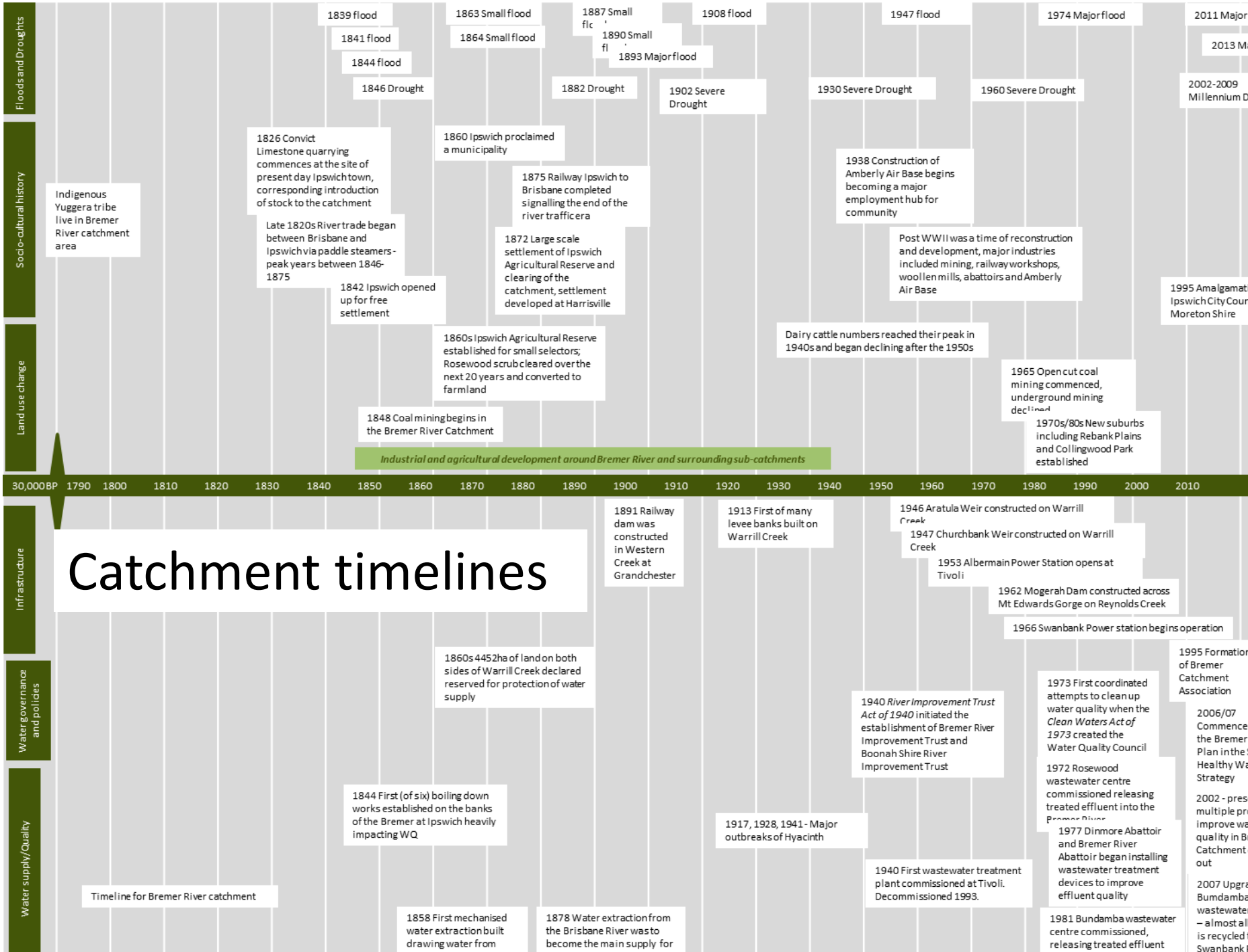

Stage 1: Compile existing knowledge
Inception and clarification of scope
Data requests and collate literature
Develop catchment histories / timelines
Stage 2: Data synthesis and development of condition/functions/management relationships
Additional data
Workshop
Identify data gaps
Synthesis of all available data
Determine existing condition, values and functions of waterways
Develop relationships
Stage 3: Final assessment, methodology and reporting
Develop conceptual model
Develop and apply scorecard approach
Document assessment method and process

Sub-catchments and ICC influence



Planned major developments



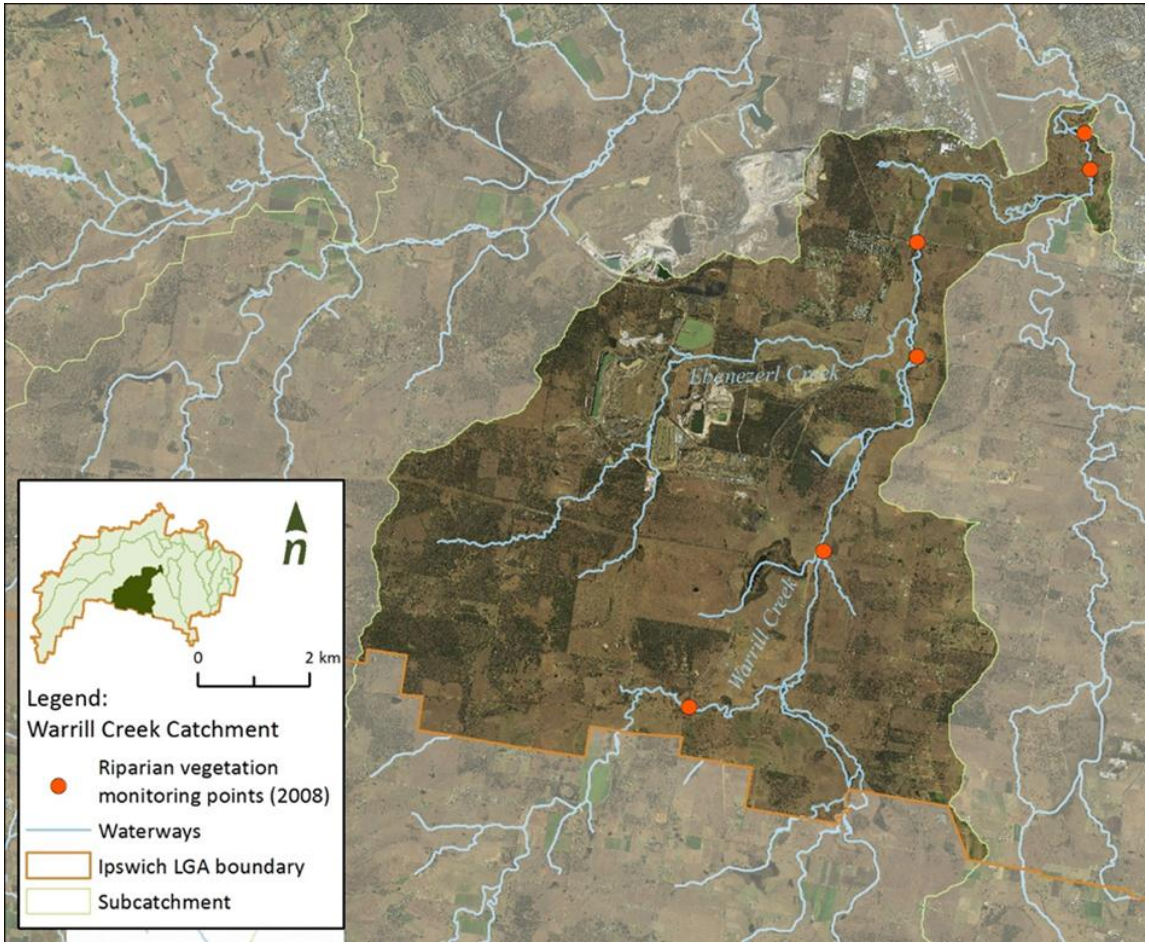

Floods and Droughts
Socio-cultural history
Land use change
Infrastructure
Water governance and policies
Water supply/Quality
1839 flood
1841 flood
1844 flood
1846 Drought
1863 Small flood
1864 Small flood
1887 Small flo
1890 Small fl
1893 Major flood
1882 Drought
1902 Severe Drought
1908 flood
1930 Severe Drought
1947 flood
1960 Severe Drought
1974 Major flood
2011 Major
2013 Ma
2002-2009 Millennium D
1826 Convict Limestone quarrying commences at the site of present day Ipswich town, corresponding introduction of stock to the catchment
1860 Ipswich proclaimed a municipality
1875 Railway Ipswich to Brisbane completed signalling the end of the river trafficera
1938 Construction of Amberly Air Base begins becoming a major employment hub for community
Indigenous Yuggera tribe live in Bremer River catchment area
Late 1820s River trade began between Brisbane and Ipswich via paddle steamers - peak years between 1846-1875
1872 Large scale settlement of Ipswich Agricultural Reserve and clearing of the catchment, settlement developed at Harrisville
Post WWII was a time of reconstruction and development, major industries included mining, railway workshops, woollen mills, abattoirs and Amberly Air Base
1995 Amalgamati Ipswich City Cour Moreton Shire
1842 Ipswich opened up for free settlement
1860s Ipswich Agricultural Reserve established for small selectors; Rosewood scrub cleared over the next 20 years and converted to farmland
Dairy cattle numbers reached their peak in 1940s and began declining after the 1950s
1965 Open cut coal mining commenced, underground mining decl
1848 Coal mining begins in the Bremer River Catchment
1970s/80s New suburbs including Rebank Plains and Collingwood Park established
Industrial and agricultural development around Bremer River and surrounding sub-catchments
30,000BP
1790
1800
1810
1820
1830
1840
1850
1860
1870
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
Catchment timelines
1891 Railway dam was constructed in Western Creek at Grandchester
1913 First of many levee banks built on Warrill Creek
1946 Aratula Weir constructed on Warrill Creek
1947 Churchbank Weir constructed on Warrill Creek
1953 Albermain Power Station opens at Tivoli
1962 Mogerah Dam constructed across Mt Edwards Gorge on Reynolds Creek
1966 Swanbank Power station begins operation
1995 Formation of Bremer Catchment Association
1860s 4452ha of land on both sides of Warrill Creek declared reserved for protection of water supply
1940 River Improvement Trust Act of 1940 initiated the establishment of Bremer River Improvement Trust and Boonah Shire River Improvement Trust
1973 First coordinated attempts to clean up water quality when the Clean Waters Act of 1973 created the Water Quality Council
2006/07 Commence the Bremer Plan in the Healthy Wa Strategy
1972 Rosewood wastewater centre commissioned releasing treated effluent into the
2002 - pres multiple pr improve wa quality in B Catchment out
1844 First (of six) boiling down works established on the banks of the Bremer at Ipswich heavily impacting WQ
1917, 1928, 1941 - Major outbreaks of Hyacinth
1977 Dinmore Abattoir and Bremer River Abattoir began installing wastewater treatment devices to improve effluent quality
1940 First wastewater treatment plant commissioned at Tivoli. Decommissioned 1993.
2007 Upgra Bumdamba wastewate – almost al is recycled Swanbank
Timeline for Bremer River catchment
1858 First mechanised water extraction built drawing water from
1878 Water extraction from the Brisbane River was to become the main supply for
1981 Bundamba wastewater centre commissioned, releasing treated effluent

Values - relationships

- Waterway values were compiled
- Their relationship with the key drivers that influence waterway condition was tested
- Understanding of those relationships considered at different scales
- Informed further data collection phase

➢ Rapid geomorphic and riparian habitat assessment

Sub-catchment condition assessments



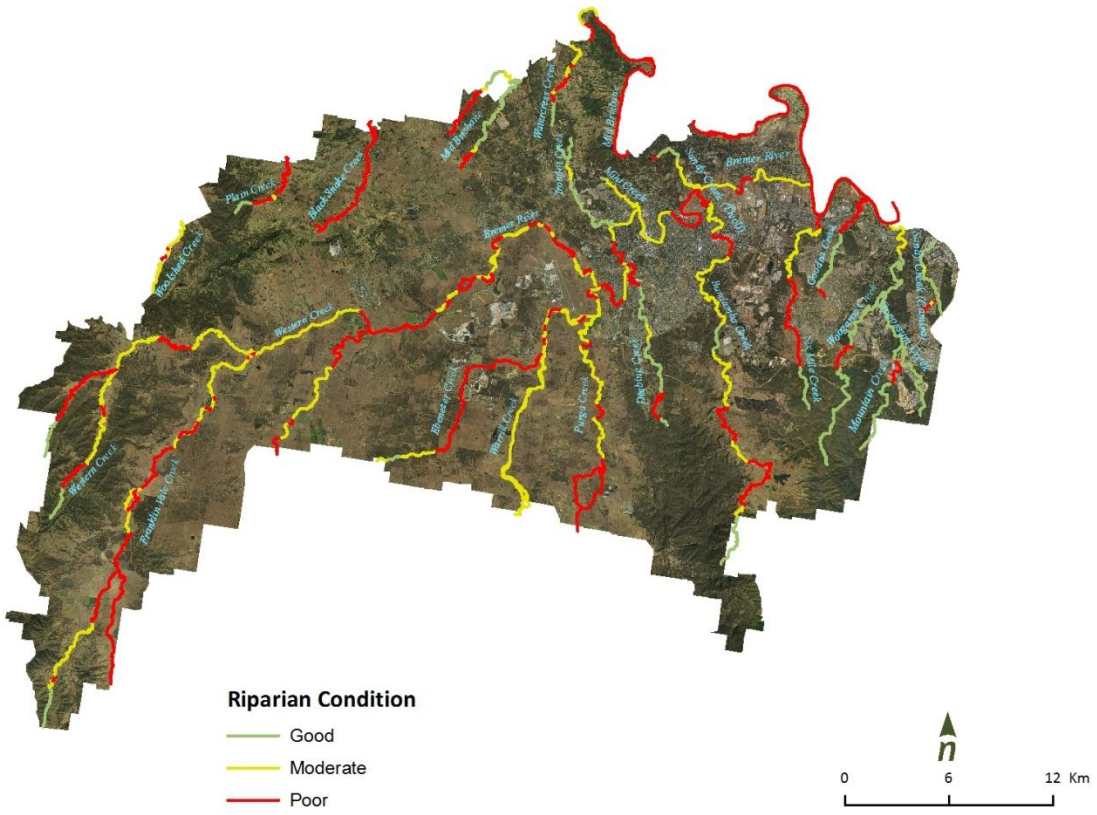
Value

- **Riparian vegetation**
- **Aquatic habitat**
- **Channel form**
- **Flow dynamics**
- **Water Quality**
- **Recreation**
- **Cultural heritage**
- **Floodplain management**
- **Wetlands**
- **Groundwater**

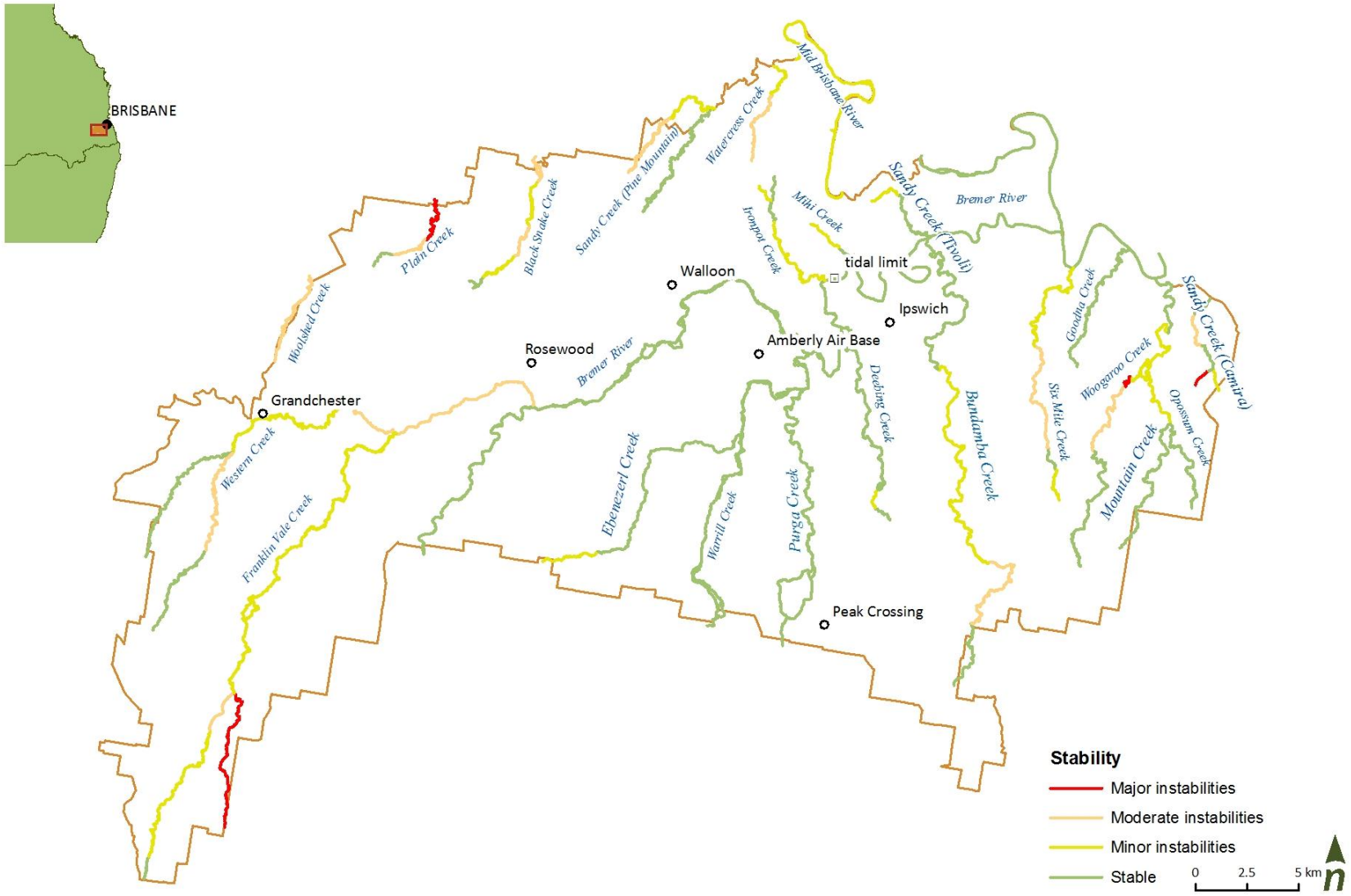
Warrill Creek example

Value	Condition
Riparian vegetation	• Riparian condition within the ICC boundary was assessed as **poor** in 1998 as part of the State of the Rivers Survey. • An assessment in 2008 of six discrete locations within the ICC boundary resulted in a riparian vegetation condition score of **moderat**e for each location.
Aquatic habitat	• Aquatic habitat condition within the ICC boundary was assessed as **good** in 1998 as part of the State of the Rivers Survey. • There are no Healthy Waterways monitoring points in Warrill Creek within the ICC LGA.
Channel form	• SEQ Catchments have identified significant areas o**f high and very high erosion risk**, both in the channel and within the sub-catchment, particularly in the mining area of Ebenezer.
Flow dynamics	• Construction of Lake Moogerah on Reynolds Creek in 1961 has had **significant impact on flow dynamics**. The dam has a total catchment area of approximately 200 km² which is over 20% of the total Warrill Creek catchment area.
Water Quality	• There are no Healthy Waterways monitoring points in Warrill Creek within the ICC LGA. There are three monitoring points in the upper Warrill Creek sub-catchment. The closest is approximately 50km upstream from the ICC LGA boundary. • The physical/chemical properties differed between the three locations but scores have remained relatively stable over the past three years. • Nutrient cycling also varies between sites with indicator scores of 0.94 and 0.64 in the Upper Warrill Creek and 0.51 in Reynolds Creek. All three locations have had variable scores over the past three years, with Warrill Creek remaining **moderate to good** (>0.5) and Reynolds Creek recording **poor nutrient cycling** in some years (0.19). • Ecosystem processes are also variable between sites, with Reynolds Creek recording higher indicator scores that Warrill Creek (ranging from 0.84-1 in Reynolds Creek and 0.48-0.97 in Warrill Creek). • The Amberley Air Base Wastewater Treatment Plant is licensed to discharge into a tributary of Warril Creek. Additionally, upstream of the ICC boundary the Aratula Wastewater Treatment plant is licensed to discharge to Warrill Creek.

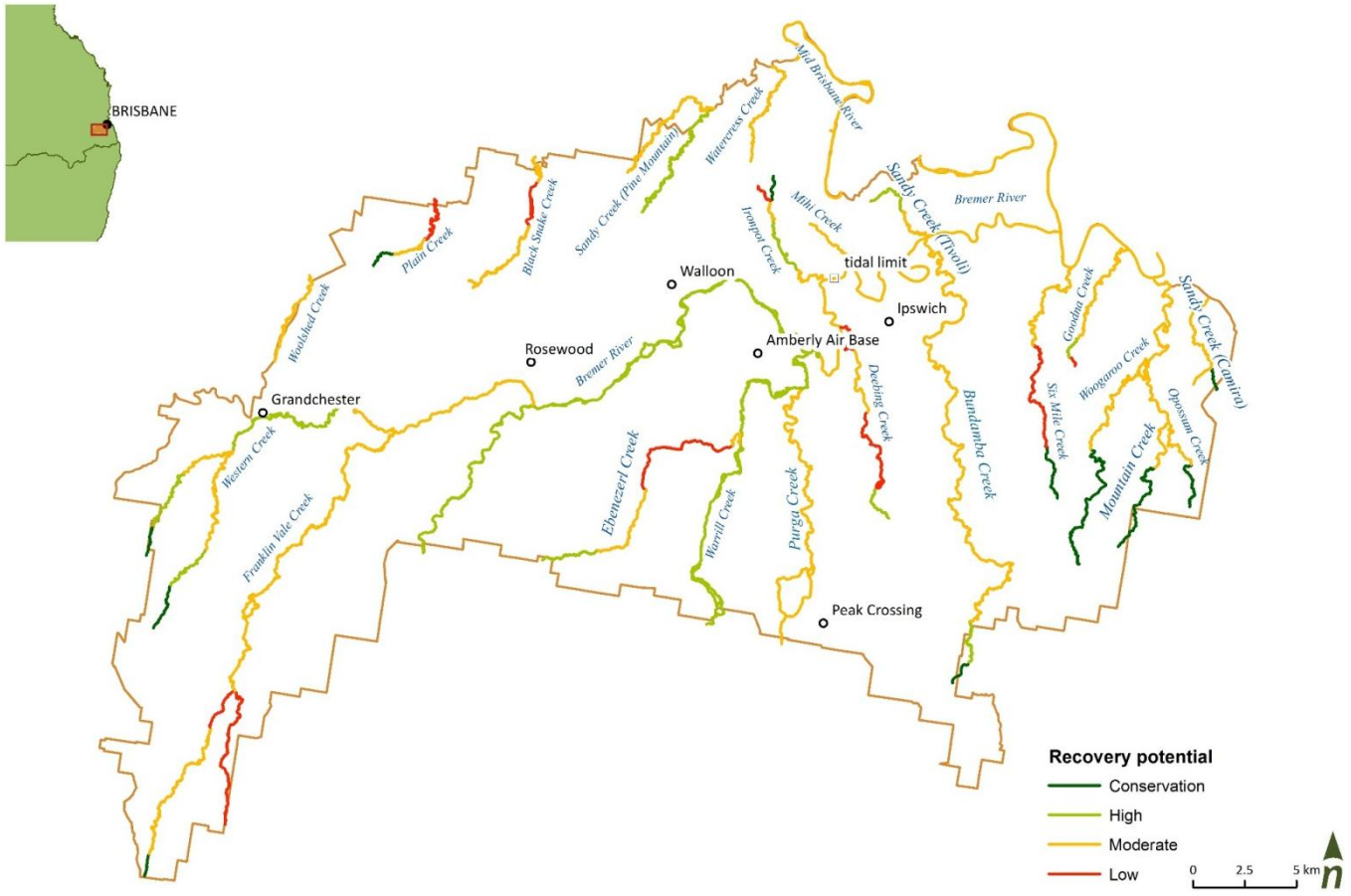
Riparian condition

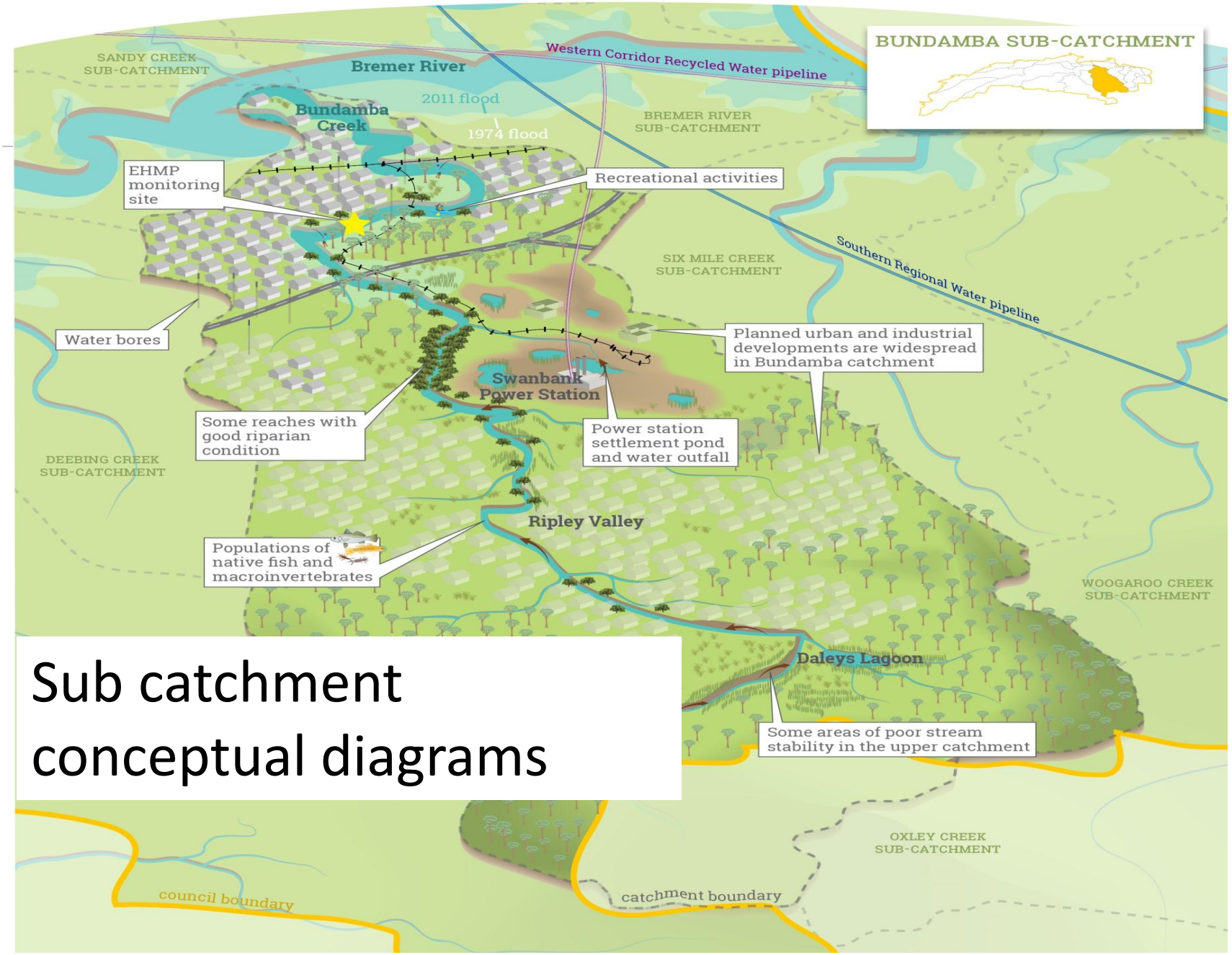


Stability


BRISBANE
Mid Brisbane River
Watercress Creek
Sandy Creek (Pine Mountain)
Black Snake Creek
Plain Creek
Woolshed Creek
Ironpot Creek
Mihi Creek
Sandy Creek (Tivoli)
Bremer River
tidal limit
Walloon
Ipswich
Amberly Air Base
Rosewood
Bremer River
Grandchester
Western Creek
Franklin Vale Creek
Ebenezer Creek
Warrill Creek
Purga Creek
Deebing Creek
Bundamba Creek
Goodna Creek
Six Mile Creek
Woogaroo Creek
Mountain Creek
Opossum Creek
Sandy Creek (Camira)
Peak Crossing
Stability
Major instabilities
Moderate instabilities
Minor instabilities
Stable
0
2.5
5 km
n

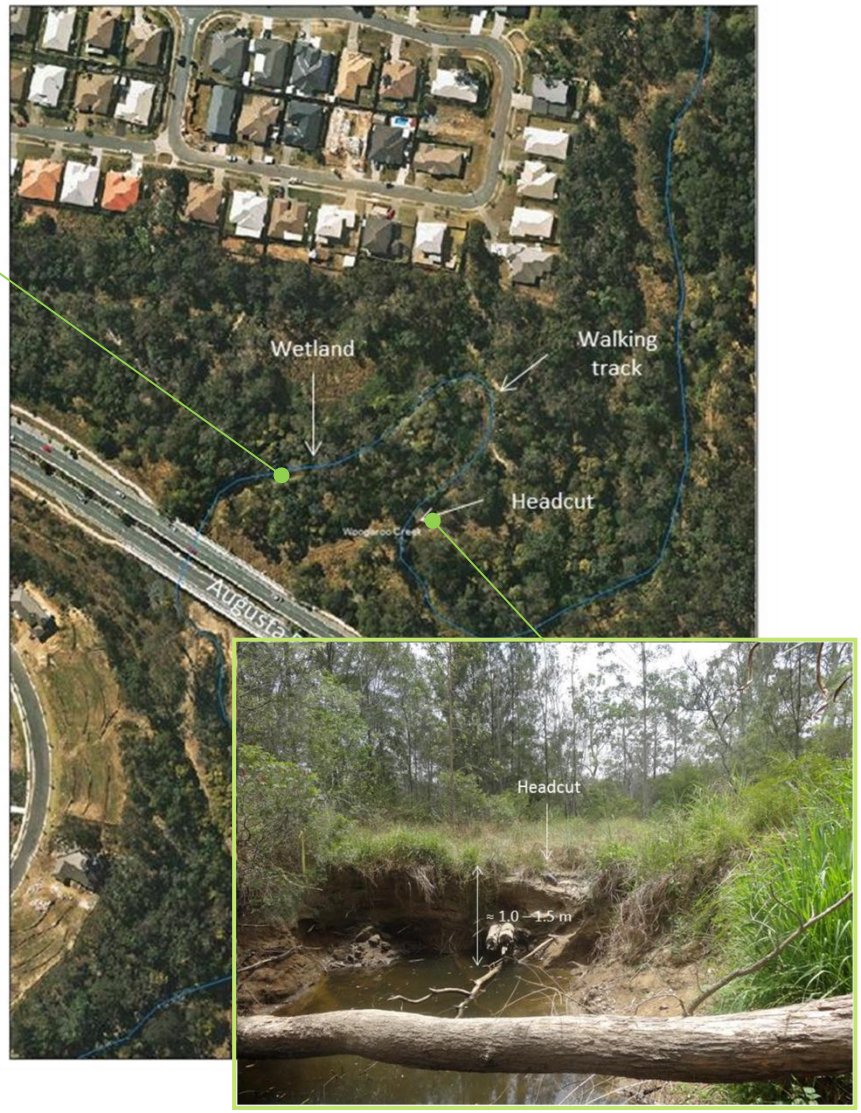
Recovery potential





Sub catchment conceptual diagrams

Management implications - Woogaroo Creek



- A headcut just downstream of Augusta Parkway.
- Significant urbanisation has occurred in the catchment upstream of this location
- The headcut is 1.0-1.5m high and is now 100m downstream from a remnant wetland
- A council path also abuts the channel between the wetland and headcut
- The wetland is understood to be an important fish breeding habitat

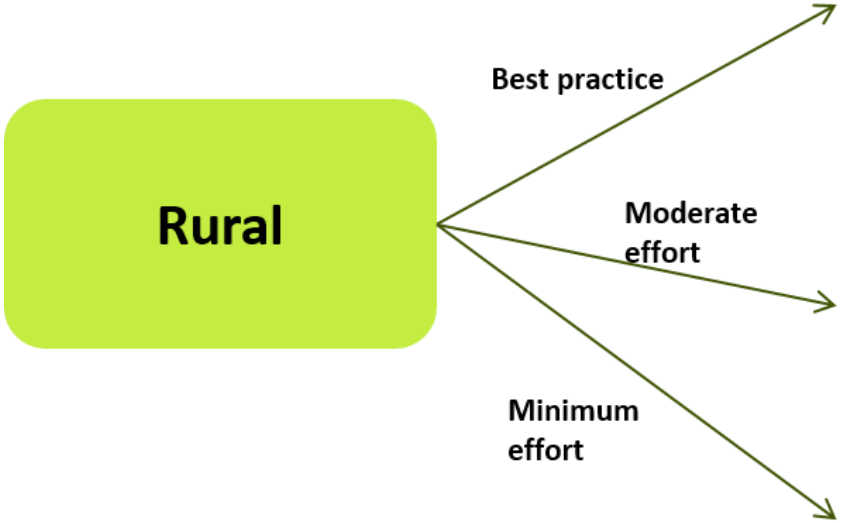
Scorecard outputs

Waterway condition

Value	Discussion of condition	Confidence in assessment
Riparian vegetation 	**Moderate** Riparian condition in the Bremer (estaury) sub-catchment is variable due to influence of urban land uses. A moderate (62%) condition grade dominated due to the fact that although the riparian zone is of limited width in most places longitudinal connectivity was generally maintained. Significant areas of poor (38%) riparian condition were present due to a significant lack of riparian vegetation.	**Medium** Based on two independent vegetation surveys (2008 and 2014). Both surveys were limited to public access points (generally well vegetated). The 2014 survey also included desktop assessment of aerial imagery along major channels.
Channel form 	**Moderate** The Bremer River (estuarine) is generally stable. Pools may be impacted by high sediment loads from upstream channel erosion (outside of LGA).	**Medium** Geomorphology survey was limited one public access point but was supplemented with desktop assessment of aerial imagery and LiDAR.
Aquatic Habitat 	**Poor** The aquatic habitat in the estuarine reach of the Bremer is considered in poor condition due to paucity of woody debris, bank overhang, roots and vegetation.	**Low** Site assessment was limited to one discrete location, supplemented by desktop assessments. Confidence on riparian vegetation and channel form influences were also considered here.
Water Quality 	**Poor** Very low levels of compliance with water quality objectives for turbidity, total nitrogen, total phosphorous and dissolved oxygen has been recorded since 2001 in EHMP monitoring. Moderate levels of compliance with water quality objectives have been recorded. Additionally abattoirs and a wastewater treatment plant are licenced to discharge into the estuary.	**High** There are seven Healthy Waterways monitoring points within Bremer (estuarine) the sub-catchment

Trajectories

- Rural
- Existing urban/industrial
- New development
- Forested/conservation



	Actions	Impact on condition
Best practice	• Revegetation and fencing with 20m+ setbacks of all waterways • Linking existing areas of high quality vegetation; clearing controls implemented • Development and implementation of an appropriate environmental flows regime • Remove levees where appropriate to encourage floodplain connectivity • Implement Best Practice Fish Passage management for all streams	• Significant increase in biodiversity • Minimise flood pulse and stream erosion forces downstream (also improves public safety downstream) • Improved baseflows for stream condition • Improved stability and therefore reduced sediment and nutrient loads downstream • Improvement in local water quality and downstream aquatic habitat
Moderate effort	• Revegetation and/or waterways fencing is opportunistic (only with willing landholders, public land or specific stability problem sites) • Green engineering channel stability measures implemented at priority sites • Implement fish passage improvement measures at major instream barriers	• Little change on a sub-catchment or regional scale. Possible local improvements depending on the scale of works • Continuing decline of aquatic habitat
Minimum effort	• Isolated revegetation and stability work when infrastructure threatened • Limited controls on vegetation clearing	• No change, or further declines in riparian zone biodiversity, stream stability, aquatic habitat, water quality, amenity, flood safety downstream.

Current uses of this project

1. Informing the new ICC Waterway Health Strategy – from city-wide to sub-catchment focus → informing investment and management priorities
2. Used in DA processes to support help deliver rehabilitated riparian areas and bank stabilisation outcomes
3. Informing Council's Stormwater Quality Offset Implementation Plan
4. Informing the broader community → factsheets for each waterway

Thankyou and questions