THE KANAMALUKA / TAMAR ESTUARY AND ESK RIVERS CATCHMENT

The kanamaluka / Tamar estuary and Esk rivers catchment is the largest catchment in Tasmania, covering nearly 15% of Tasmania's landmass. The North and South Esk rivers drain into the kanamaluka / Tamar estuary which extends approximately 70 km from Launceston to Bass Strait. Major tributaries of the South Esk river including the Macquarie river, Meander river, Brumbys creek and Lake river. Additional flows sourced from yingina / Great lake enter Brumbys creek via the Poatina Power Station. The region sustains a diverse range of land uses, including grazing, dairy, cropping, plantation and native forestry, mining, heavy industry, urban, rural residential, and nature conservation areas. Several irrigation schemes operate in the catchment. Launceston is a major urban centre in the catchment, with a population of around 90,000 people. The region provides substantial input to Tasmania's economy as well as sustaining key ecological assets and communities.

The TEER Program acknowledges and pays respect to the Tasmanian Aboriginal people, the Traditional Owners of Tasmania, and the kanamaluka / Tamar estuary and Esk rivers. We pay respect to elders past and present, and acknowledge their connection with and custodianship of land, sea, and sky Country.

The South Esk river, pictured below, is one of five major river systems that feed into the kanamaluka / Tamar estuary.
Photo credit: Sheldon Daley.

IMPACTS ON FRESHWATER ECOSYSTEM HEALTH

There are a range of frameworks for assessing waterway health, varying from relatively simple to extremely complex. Most of these frameworks focus on three key components:

- Aquatic habitat in terms of extent, condition, and connectivity. This is affected by factors such as flow regime, physical form and instream physical habitat (e.g., woody debris and snags), water quality, and barriers to the movement of aquatic species.
- Riparian habitat in terms of extent, condition, and connectivity. This affects stream bank stability, shade and water temperature, and the suitability of stream reaches to animals and plants that use the edges for part of their life cycle.
- Biodiversity of aquatic and freshwater dependent species. This consists of the plant and animal species that form part of the waterway ecosystem.

This report card focuses on available indicators of these components. These indicators allow a quantitative assessment of ecosystem health. It is important to note that data was only available across all catchments for a limited numbers of indicators – for example only water quality data was available to assess aquatic habitat. Considering the quantitative assessment of grades in the context of these limitations is important.

WHAT DO THE GRADES MEAN?

Freshwater Report Card grades ('A' to 'E') are generated for ten zones of the kanamaluka / Tamar estuary and Esk rivers catchment for three ecosystem health indicators (aquatic life, aquatic habitat, riparian habitat) and overall. Grades for aquatic life and aquatic habitat are based on average condition across monitoring sites in each zone while riparian habitat is assessed across the entire reach of rivers and creeks in the zone.

A EXCELLENT

Conditions at most monitoring sites or for the majority of river reaches reflect high conservation status and/or show minimal impacts of disturbance.

B GOOD

Most sites or river reaches have some impairment or disturbance impacts but the condition represents a healthy modified condition.

C FAIR

Most but not all sites or reaches have a substantial level of disturbance or impairment with the zone having a mix of healthy, minimally impacted areas, and degraded reaches.

D POOR

Sites or reaches are a mix of substantially and severely impacted with very few sites or reaches in a healthy condition.

E VERY POOR

Most sites or reaches have severe impairment or are severely degraded through disturbance.

+ -

'+' and '–' signs are included to indicate smaller changes within the bands of the grade scores.

HOW THE GRADES ARE CALCULATED

The 2023 Freshwater Report Card has been produced using four years of data (July 2018 to June 2022) provided by TEER Program partners which was collected as part of their routine sampling programs. Grades in this report card have been calculated for three measures of ecosystem health:

- Aquatic habitat – based on analysis of water quality data for dissolved oxygen saturation, turbidity, total nitrogen, total phosphorus and nitrate + nitrite (NOx).
- Aquatic life – based on analysis of macroinvertebrate sampling.
- Riparian habitat – based on an assessment of condition and extent of native riparian vegetation.

Further information on the data, methods, and results for the Freshwater Report Card can be found in the Technical Report and Methodology Report on the TEER Program website www.teer.org.au.

WHAT IS ECOSYSTEM HEALTH?

An ecosystem consists of plant and animal communities and the physical environment in which they live. Ecosystem health is a measure of the wellbeing and natural condition of an ecosystem and its function. It is affected by natural and human induced pressures. Poor ecosystem health can reduce the resilience of the system and its ability to withstand additional pressures and change. Ecosystem health is a complex concept and can be difficult to measure directly. It is generally described by comparing key water quality and biological indicators to acceptable levels and established reference conditions.

WHY MONITOR?

It is important to monitor the health of the kanamaluka / Tamar estuary and Esk rivers catchment rivers and creeks so that natural resource managers can better evaluate the condition of our waterways and target investments and on-ground works to improve ecosystem health. TEER Program partners undertake a range of ongoing monitoring activities, such as water quality and macroinvertebrate sampling for various purposes including fulfilling regulatory requirements and providing ongoing assessments of river health. The TEER Program benefits from the monitoring activities of its partners, in being able to pull together this significant data resource to produce the Freshwater Report Card.

TAMAR ESTUARY AND ESK RIVERS (TEER) PROGRAM

The TEER Program was established in 2008 and is a voluntary regional partnership between the agencies responsible for the management of the kanamaluka / Tamar estuary and Esk rivers. A key goal of the program is to improve scientific understanding of the issues impacting the health of the kanamaluka / Tamar estuary and Esk rivers catchment waterways.

PROGRAM PARTNERS

Tasmanian Government · City of Launceston · NRM North · West Tamar Council · Meander Valley Council · Northern Midlands Council · taswater · Hydro Tasmania · TasPorts · EPA Tasmania · Poatina · Dairy Australia · Bell Bay Aluminium · Tasmanian Irrigation · GFG Alliance · AMC Australian Maritime College · University of Tasmania · IMAS

TEER Healthy waterways together

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The 2023 Freshwater Report Card is not comparable to the 2013 Freshwater Report Card due to changes in methodology and indicators used to derive grades. For more information, refer to the technical report at teer.org.au

Cover photo courtesy of Louise Rhodes.

TEER Healthy waterways together

Tamar Estuary & Esk Rivers Program

TAMAR ESTUARY AND ESK RIVERS CATCHMENT 2023 FRESHWATER REPORT CARD

A FOUR YEAR BASELINE REPORT CARD FOR THE CONDITION OF FRESHWATER ECOSYSTEMS IN THE TAMAR ESTUARY AND ESK RIVERS CATCHMENT (JULY 2018 - JUNE 2022)

INTRODUCTION

The Freshwater Report Card is a simple snapshot of freshwater ecosystem condition that aims to increase awareness about the health of rivers and creeks in the kanamaluka / Tamar estuary and Esk rivers catchment and factors that may impact waterway health. It complements the kanamaluka / Tamar Estuary Report Card which specifically focuses on the health of the kanamaluka / Tamar estuary.

KEY MESSAGES

Freshwater ecosystem condition refers to health of the rivers and creeks that flow into the kanamaluka / Tamar estuary. This captures the health of the habitat provided by the river or creek (aquatic habitat), the health of the vegetation that is adjacent to the waterway (riparian habitat), and the animals and plants that rely on the waterways for habitat (aquatic life). All these factors are interrelated with the health of one component impacting on, and being impacted by, the others.

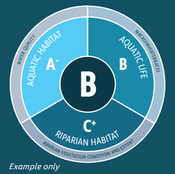
Freshwater ecosystem health varies from good to fair across the kanamaluka / Tamar estuary and Esk rivers catchment, with upland areas in better condition than lowland areas in the same sub-catchment. Better ecosystem health is generally associated with less urban and agricultural development and a higher proportion of forested areas.

Aquatic habitat is assessed based on water quality, which ranges between fair to excellent across the catchment. Aquatic habitat condition is better than riparian habitat in all zones. Differences between aquatic habitat and aquatic life condition in each zone are mixed.

Reduced riparian habitat condition is a driver of overall poorer freshwater ecosystem condition. The range of riparian habitat grades are lower than those for aquatic life and aquatic habitat, with grades varying from fair to very poor across the reporting zones. No zone received a grade of good or excellent for riparian habitat. Lowland and urban areas where land has been cleared for development generally have the lowest riparian habitat grades.

Aquatic life is affected by aquatic habitat and riparian habitat. Aquatic habitat in some parts of the freshwater system will have been degraded by clearing of the riparian vegetation, increased algal growth and smothering by sediment. Modification of flow regimes, through the loss of pervious areas which slow surface runoff or through construction of dams upstream and regulation of flows, can also have significant impacts on aquatic life. These factors are likely to be influencing aquatic life grades in Launceston urban areas, Brumbys-Lake Lowlands and the South Esk Lowlands, where aquatic life was rated as poor or fair.

Activities to protect and improve riparian vegetation and aquatic habitat should be a focus to improve freshwater ecosystem health across the kanamaluka / Tamar estuary and Esk rivers catchment.



Waterway health scores for each sub-catchment are presented using the above framework. The overall health score for the sub-catchment is presented in the centre of the framework, with scores for the contributing components surrounding this.

Indicators used to calculate component scores are included in the outer circle of the framework, aligned with the specific component that they relate to. Indicators are the same for each sub-catchment.

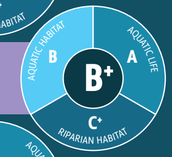
Further information on the methods for the Freshwater Report Card can be found under the 'How the grades are calculated' section of the report card, and in the Technical Report and Methodology Report on the TEER Program website www.teer.org.au.

Launceston Urban (including North Esk Lowlands)

The freshwater system is in fair condition. The zone is primarily urban and agricultural land (42% each) with minimal remaining forest cover. The poor condition of aquatic life is likely due to heavily modified instream habitat (smothering by sediment, heavy algal growth, changed flow with increased impervious areas) and poor riparian habitat.

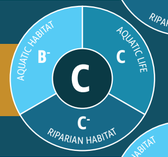
North Esk Uplands

Nearly 75% of the zone is forested and flow regimes are generally near natural. The system is in overall good condition, with good aquatic habitat and excellent aquatic life grades. Fair riparian habitat condition is due to a lack of native vegetation in developed areas.



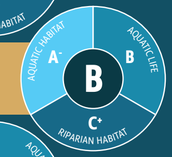
South Esk Lowlands

Nearly 2/3 of the zone has been developed for agriculture with modifications to flow regime from flow regulation and irrigation extraction. This and the fair condition of riparian habitat are likely to be influencing the fair condition of aquatic life.



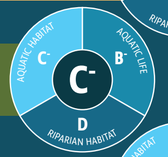
South Esk Uplands

Overall good condition due to good aquatic life, fair riparian habitat, and excellent aquatic habitat grades. Nearly 85% of the zone remains forested.



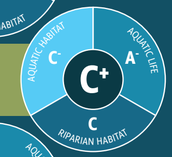
Macquarie Lowlands

This is one of three of the most developed zones - 85% of the zone has been developed for agriculture with 12% of forest remaining. Aquatic habitat condition is fair. Riparian habitat is poor while the grade for aquatic life is good, but just above the threshold for fair condition.



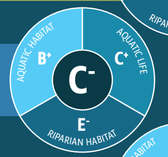
Macquarie Uplands

This zone is the most developed of the upland zones with over 50% developed for agriculture. While the grade for aquatic life is excellent, the grades for aquatic habitat and riparian habitat are fair with an overall fair grade.



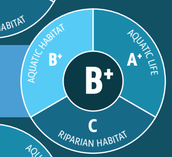
Brumbys-Lake Lowlands

This zone is the most developed - only 10% of the area remains forested. Riparian habitat is very poor. Aquatic life is fair and aquatic habitat received a good grade. It is likely impacted by riparian habitat and other factors such as modified flow regimes. Overall the zone is in fair condition.



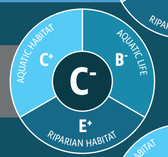
Brumbys-Lake Uplands

The relatively intact nature of the zone, with nearly 50% of native forest remaining, is reflected in its good overall condition. Good aquatic habitat, excellent aquatic life, and fair riparian habitat are experienced in this zone.



Meander Lowlands

Riparian habitat is in very poor condition. This is likely influenced by the relatively large proportion of urban areas (8%) in addition to over 50% of the zone being developed for agriculture. Aquatic habitat received a fair grade and aquatic life scored good. The overall grade for this zone is fair.



Meander Uplands

While 2/3 of the zone remains forested (native or production forests), there is a relatively large proportion of urban areas (5%) in the zone. These are likely to contribute to the poor condition of riparian habitat. The large area of remnant forest is likely to be influencing good aquatic habitat and excellent aquatic life condition.