

# Vision for the Tamar Estuary AND ESK RIVERS SYSTEMS 2030

*‘Healthy, productive, valued and enjoyed – Our Rivers Of Life’*

## Key Messages

- This report card is a ‘historic’ snapshot of ecosystem health for the Tamar Estuary; a reference point for future report cards
- Mouth of the estuary (Zone 5) is in excellent health
- Ecosystem health of upper estuary (Zone 1) is degraded
- All zones have periods where water quality guidelines are not met
- Recreational water quality is variable – check for warning signs before swimming
- Elevated metals, a component of water quality, is primarily due to historic mining activities in upper catchments
- Rainfall (wet and dry years) can significantly affect water quality
- TEER is a coordinated approach to monitoring the health of our waterways

## Report Card

The 2010 Report Card uses an easy to understand grading system of “A” through to “F” for five zones within the estuary. The grades represent the overall health of the Tamar Estuary from 35 monitoring sites using historic data from 1999 to 2009. The monitoring data from 2007 has been included as a reference to compare future annual report card data against.

The 2010 Report Card has been developed to complement the State of the Tamar Estuary Report 2008 which provides additional technical information related to the health of the Tamar Estuary.

## Why Monitor?

It is important to monitor and understand the health of the Tamar Estuary so that natural resource managers can better evaluate the condition of our waterways and target investment and on-ground works to improve waterway health.

The Ecosystem Health Assessment Program (EHAP) will also enable managers to better evaluate the effectiveness of future activities undertaken to improve waterway health such as sewage treatment plant upgrades, stormwater controls, and wastewater treatment.

## Ecosystem Health Assessment Program

The TEER Ecosystem Health Assessment Program (EHAP) for the Tamar Estuary covers an area extending 70 kilometres from the Tamar yacht basin at the confluence of the North and South Esk Rivers to the mouth of the Tamar Estuary at Low Head. The EHAP is a joint partnership between NRM North and monitoring partners including the Tasmanian Government, Launceston City Council, West Tamar Council, George Town Council, Meander Valley Council, University of Tasmania, Hydro Tasmania, Ben Lomond Water, BCD Resources, BHP Billiton TEMCO, Rio Tinto Alcan and Van Diemen Aquaculture.

## Tamar Estuary and Esk Rivers (TEER) Program

The EHAP is an initiative of the Tamar Estuary and Esk Rivers (TEER) Program. The TEER was established in 2008 and is a regional partnership between the agencies responsible for management of the Tamar Estuary and Esk Rivers waterways.

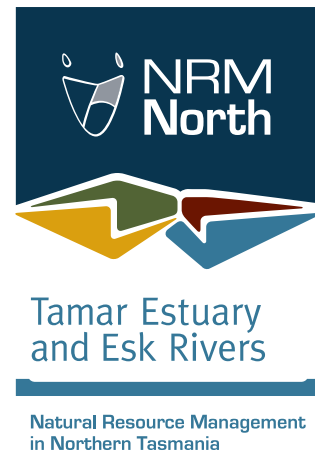
The TEER Program aims to provide a coordinated management approach and guide for solutions and investment to protect, maintain and enhance the Tamar Estuary and Esk Rivers systems from ‘catchment to coast’.

A key goal is to improve our scientific understanding of the issues impacting upon the health of the TEER waterways so that we can better identify and target priority areas requiring investment in on-ground works.

The TEER Program fosters collaborative partnerships and works closely with a range of industry, community, government, research and business partners to monitor and report on waterway health as well as coordinating activities to reduce pollutants entering waterways.

## What is Ecosystem Health?

Ecosystem health is determined by the response of the environment to natural and human inputs and is defined as the degree to which the actual state of an ecosystem diverges from an ideal state as defined in management objectives. A healthy estuarine and marine ecosystem will have the following characteristics: key processes operating to maintain stable and sustainable ecosystems, zones of human impacts that do not expand or deteriorate, and aquatic ecosystems (critical habitats) which remain intact. As these characteristics are complex and difficult to measure, there are more easily measured parameters that are used to infer ecological health which have been used in the EHAP. These parameters include water quality (nutrients, pH, chlorophyll a, metals), and recreational water quality (bacteriological counts).



## Further Information

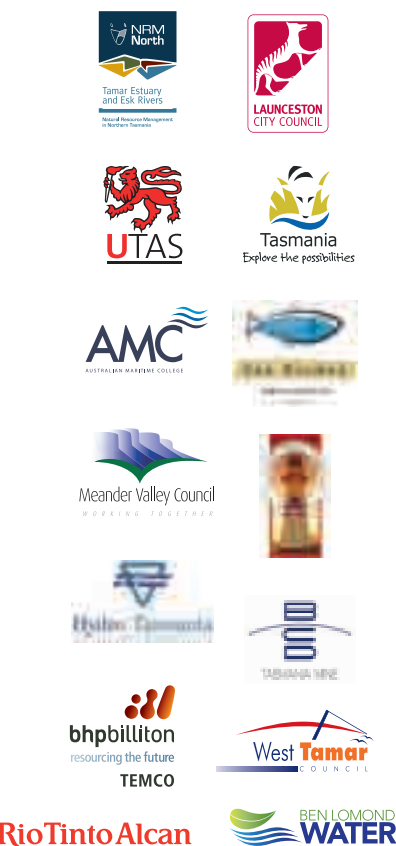
### TEER Program

P: (03) 6333 7777

E: admin@nrmnorth.org.au

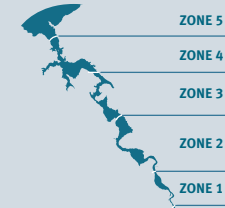
W: www.nrmnorth.org.au

## Monitoring Partners



## Methods

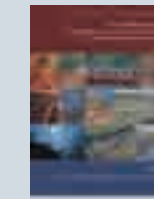
- 1 Five functional zones were identified based on differences in critical habitats (e.g. seagrass, rocky reefs, wetlands), key processes (phytoplankton abundance; chl a), human impacts (nutrient levels, e.g. total nitrogen [TN]; and metals, e.g. Zinc) and salinity within the estuary.



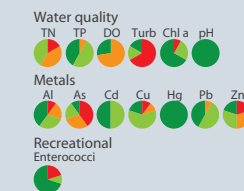
- 2 Previous monitoring data gathered and indicators determined using other ecosystem health monitoring programs from around Australia. Indicators were grouped into two categories: water quality (including metals) and recreational.

TN	Chl a
TP	DO
pH	Metals
Turb	Enterococci

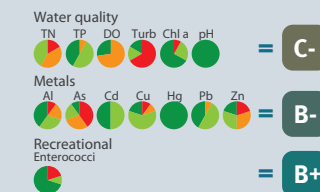
- 3 Data was spatially analysed and assessed against ANZECC (Australian and New Zealand Environment Conservation Council) Guidelines for Fresh and Marine Water Quality, the Tasmanian Surface Water Quality Guidelines and the Tasmanian Public Health Act Recreational Water Quality Guidelines.



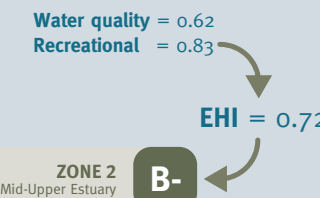
- 4 Exceedence scores were calculated for each indicator from each category, for each of the five zones.



- 5 Ecosystem Health Index (EHI) calculated for each category in each zone by averaging indicator exceedence scores. EHI is then converted to a letter grade for each category in each zone.



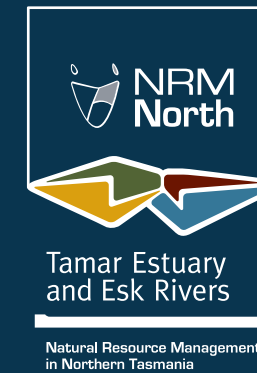
- 6 Average of the EHI's used to generate a Report Card Grade for each zone. The letter grade represents the overall health of that zone.



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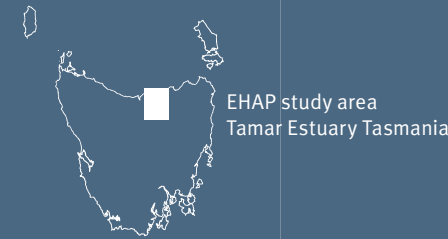
# TAMAR ESTUARY 2010 REPORT CARD

## ECOSYSTEM HEALTH ASSESSMENT PROGRAM



# Tamar Estuary

## 2010 REPORT CARD RESULTS



### What do the grades mean?

Ecosystem Health Report Card Grades ('A' to 'F') are generated for five (5) zones in the Tamar Estuary. Parameters are assessed against guidelines resulting in the determination of a single grade for each zone. The EHI (Ecosystem Health Index) is a numerical representation of how often the indicators meet water quality and recreational guidelines.

- A EXCELLENT** (EHI: 0.86 – 1.00)  
- conditions meet all set ecosystem health values more than 85% of the time;
- B GOOD** (EHI: 0.70 – 0.85)  
- conditions meet all set ecosystem health values in most of the reporting region;
- C FAIR** (EHI: 0.60 – 0.69)  
- conditions meet some of the set ecosystem health values in most of the reporting region;
- D POOR** (EHI: 0.50 – 0.59)  
- conditions are unlikely to meet set ecosystem health values in most of the reporting region;
- F FAIL** (EHI: <0.50)  
- conditions meet set ecosystem health values less than 50% of the time;

**+/-** '+' and '-' grades are included to show when there has been a minor improvement or decline in the ecosystem health of a zone.

#### ZONE 5: Mouth

Index	2007 data	% target	1999-2009 data	% target
Water quality	B		B-	
Recreational	A+		A+	

**A-**

Excellent ecosystem health. Good water quality, but impacted during storm events by elevated parameters such as total nitrogen and some metals. Excellent recreational water quality with guidelines met all of the time.

#### ZONE 4: Mid-Lower Estuary

Index	2007 data	% target	1999-2009 data	% target
Water quality	B-		C	
Recreational	A+		A+	

**B+**

Good ecosystem health. Fair water quality, impacted by elevated turbidity, total nitrogen and some metals, potentially due to stormwater runoff and re-suspension of historic sediment contamination, such as the elevated metals in sediments at Deceitful Cove and Middle Arm. Excellent recreational water quality with guidelines met all of the time.

#### ZONE 3: Mid Estuary

Index	2007 data	% target	1999-2009 data	% target
Water quality	A-		B-	
Recreational	A+		B+	

**B**

Good ecosystem health with all guidelines met most of the time. Good water quality, impacted by elevated metals. Recreational water quality meets the guidelines most of the time.

#### ZONE 2: Mid-Upper Estuary

Index	2007 data	% target	1999-2009 data	% target
Water quality	C+		C-	
Recreational	A+		B+	

**B-**

Good ecosystem health. Fair water quality, impacted by elevated turbidity, total nitrogen and some metals. Recreational water quality meets guidelines most of the time.

#### ZONE 1: Upper Estuary

Index	2007 data	% target	1999-2009 data	% target
Water quality	F		D	
Recreational	C		C-	

**D**

Highly degraded ecosystem health. Poor water quality, with high levels of turbidity and total nitrogen. Elevated metals probably due to historic mining activities in the upper catchments. Recreational water quality meets guidelines some of the time.

## Environmental Goals

In Tasmania, the maintenance or enhancement of waterway health is driven by environmental goals which are derived from Protected Environmental Values (PEV's). These goals were developed through a process of community consultation and identification of social, cultural/heritage, environmental and economic values. The environmental goals for the Tamar Estuary are:

- Maintain/restore recreational water quality and aesthetics for primary contact (e.g. swimming, diving, surfing, water skiing).
- Protection of modified (not pristine) aquatic ecosystems: seagrass, rocky reefs, sponge gardens.
- Protection of edible fish and crustaceans for harvesting excluding shellfish except where permitted to be harvested under the *Living Marine Resources Act 1995*.



## Recreational Messages:

- It is not safe to harvest and consume wild shellfish from the Tamar Estuary
- Check for current warnings and signs from councils regarding swimming

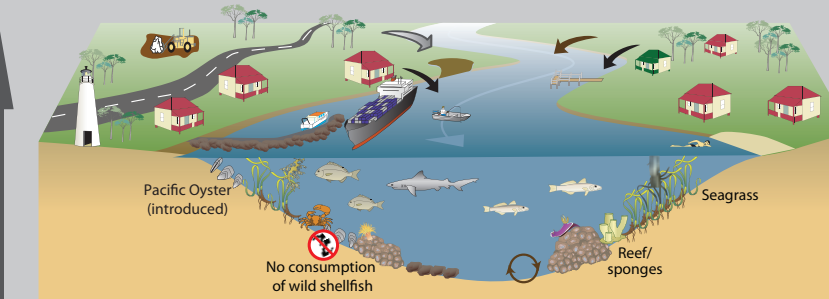
#### MAP LEGEND:

- Urban areas
- Monitoring sites
- Tamar Estuary catchment boundary

## Conceptual models of the Tamar Estuary

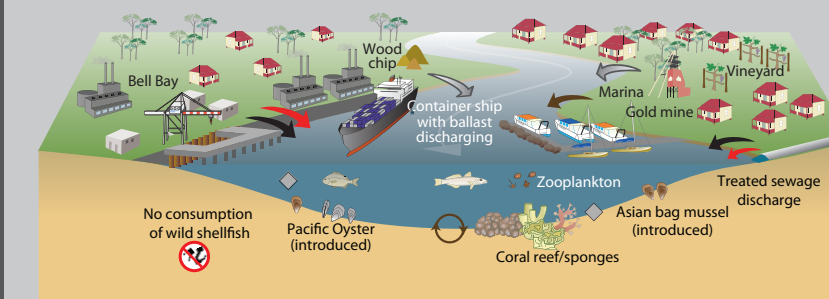
Conceptual models are developed to illustrate key processes, habitats and management challenges in a specific environment. The conceptual models of the Tamar Estuary shown below were developed

to capture our understanding of the way in which the ecosystem functions and are designed to be updated as our understanding improves over time.



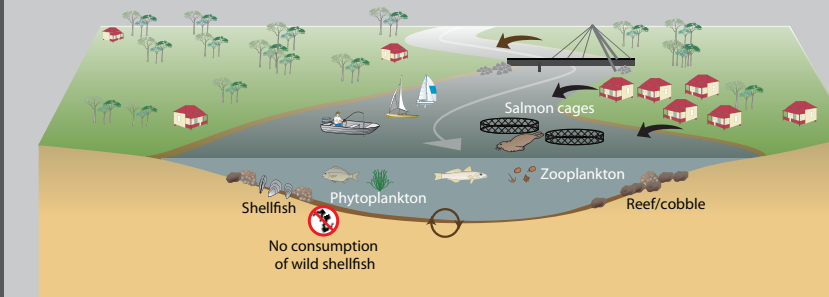
#### ZONE 5: Mouth

- Catchment runoff
- Sediment/water cycling
- Stormwater discharge
- Metals input



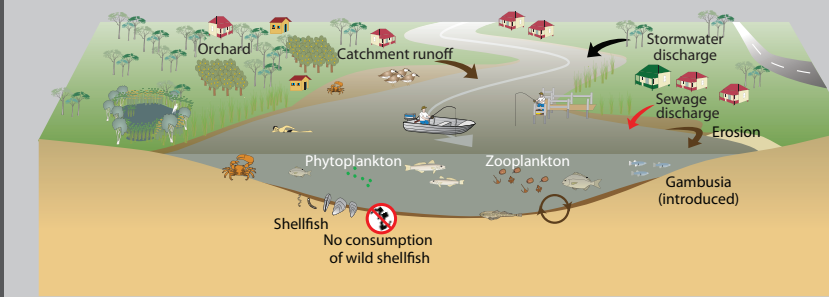
#### ZONE 4: Mid-Lower Estuary

- Metals input
- Elevated metals (sediment and water)
- Sediment/water cycling
- Stormwater discharge
- Treated sewage discharge
- Catchment runoff



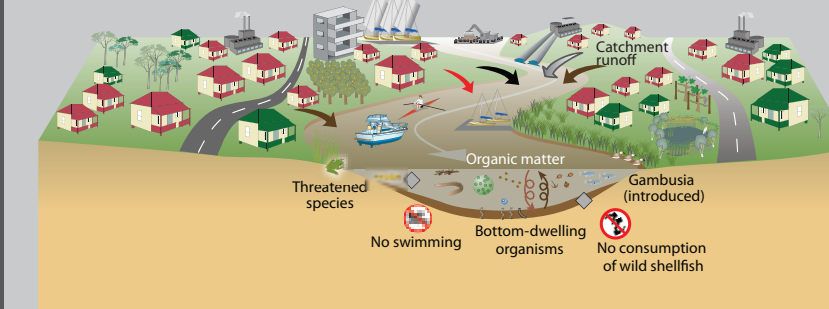
#### ZONE 3: Mid Estuary

- Catchment runoff
- Sediment/water cycling
- Stormwater discharge



#### ZONE 2: Mid-Upper Estuary

- Catchment runoff
- Erosion
- Sediment/water cycling
- Treated sewage discharge
- Stormwater discharge



#### ZONE 1: Upper Estuary

- Elevated metals (sediment and water)
- Sediment deposition
- Sediment resuspension
- Stormwater discharge
- Treated sewage discharge
- Catchment runoff
- Metals input