



THE D'ENTRECASTEAUX CHANNEL AND LOWER HUON ESTUARY

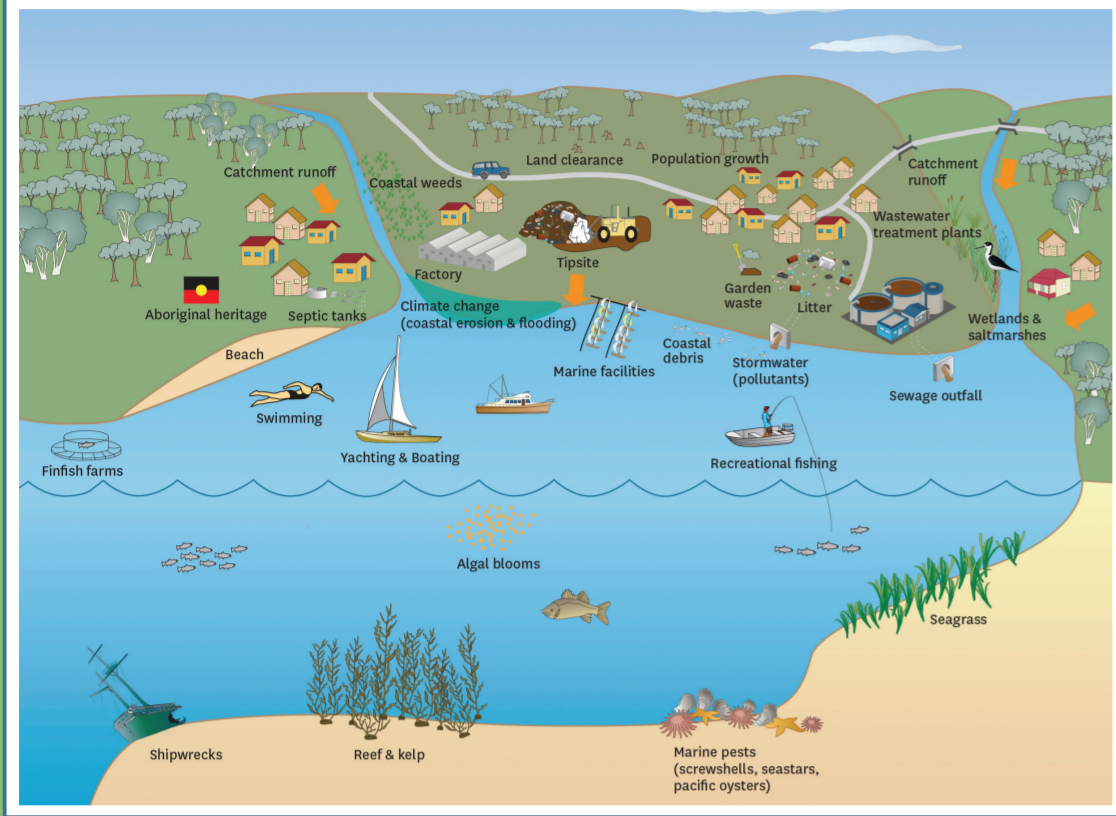
The D'Entrecasteaux Channel and lower Huon Estuary are located in Tasmania's south-east; the northern end of the waterway is approximately 20 km south of the state's capital, Hobart. The D'Entrecasteaux Channel is separated from Storm Bay and the Tasman Sea to the east by Bruny Island, and the Huon Estuary joins the Channel near its southern limit. At its northern end, the Channel connects with the lower Derwent Estuary and Storm Bay, and in the south it is connected to the Southern Ocean.



Snapshot of the state of the D'ENTRECASTEAUX CHANNEL AND LOWER HUON ESTUARY

D'ENTRECASTEAUX CHANNEL PROJECT
 'Working together to sustainably manage the D'Entrecasteaux Channel and lower Huon Estuary'

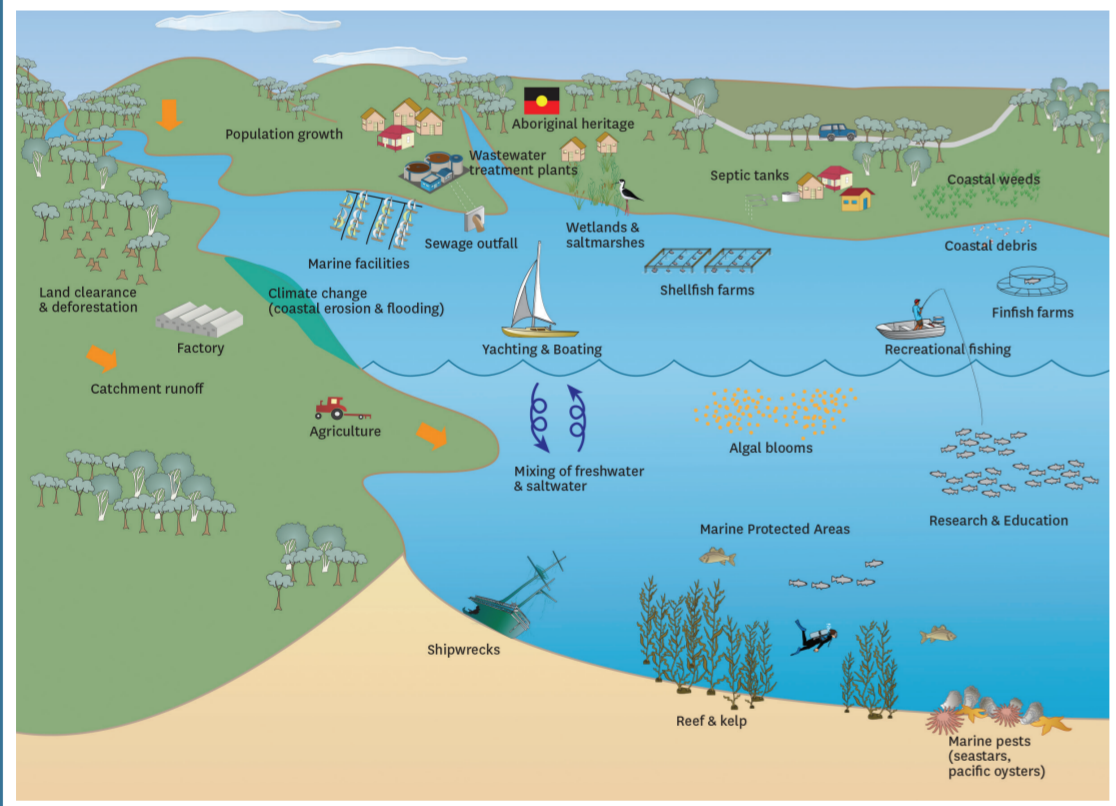
NORTH WEST BAY



WATERWAY FACTS

- Area of waterway**
446 km²
- Length of coastline**
405 km
- Depth of waterway**
Greater than 10 m across most of the waterway; Maximum depth is 55 m
- Major river inputs**
Huon River, North West Bay River, Kermadie River, Esperance River
- Population**
50,000 in surrounding municipalities
- Uses**
Recreational activities such as swimming, boating and fishing, tourism, aquaculture, seafood processing, research/education, and conservation

LOWER HUON ESTUARY



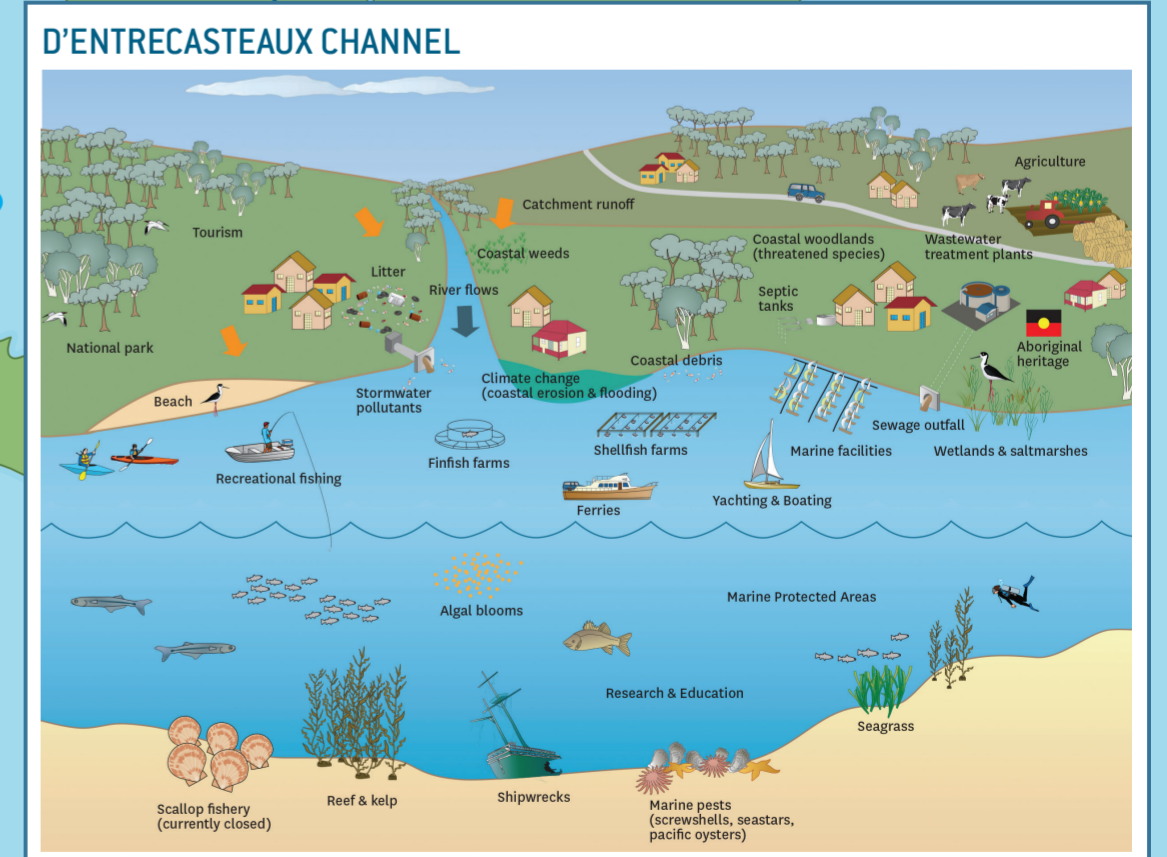
BROADSCALE ENVIRONMENTAL MONITORING PROGRAM

The Broadscale Environmental Monitoring Program is a regulatory monitoring program that has been in place since 2009. As a requirement of their licence to operate in the D'Entrecasteaux Channel and Huon Estuary area, the finfish aquaculture industry must participate in this monitoring program. Fifteen sites are monitored in the waterways (shown on the map) to assess changes to water and sediment quality. An independent evaluation of the data collected through this monitoring program has recently been undertaken by the Institute for Marine and Antarctic Studies for the state government. The report is available on the Department of Primary Industries, Parks, Water and Environment website.
www.dpipwe.tas.gov.au

YOUR MARINE VALUES, INSTITUTE FOR MARINE AND ANTARCTIC STUDIES

The Your Marine Values study has conducted a series of community, government and industry workshops to identify what values are important to these groups of people in relation to the marine waters of the D'Entrecasteaux Channel and lower Huon Estuary. This information will be used to assist with future monitoring and planning for aquaculture and other uses of these waterways.

Refer to the Institute for Marine and Antarctic Studies website for further information.
www.imas.utas.edu.au



- KEY**
- Water sampling station
 - Sediment sampling station
 - Marine farming zones
 - Beach monitoring sites
 - Surface Current
 - Bottom Current
- WASTEWATER TREATMENT PLANTS (WWTPs)**
- < 100 kL/day (Level 1) Domestic Wastes
 - > 100 kL/day (Level 2) Domestic Wastes
 - > 100 kL/day (Level 2) Domestic and Industrial Wastes

Map data from various sources. Please refer to full report (Parsons 2012) for details.

PROJECT PARTNERS:



TasWater



Snapshot of the state of the D'ENTRECASTEAUX CHANNEL AND LOWER HUON ESTUARY



This document provides an overview of the status of key environmental indicators of the D'Entrecasteaux Channel and lower Huon Estuary based on data collected since 1999. This information will be used to inform management planning and as a point of comparison for future data analyses to describe the condition of the waterways.

This brochure is derived from the *State of the D'Entrecasteaux Channel and lower Huon Estuary 2012* report, which is available via the environment link of:

www.kingborough.tas.gov.au

WHAT DO WE KNOW ABOUT THE WATERWAYS?

The D'Entrecasteaux Channel and lower Huon Estuary are both unique and important for their natural, heritage, economic and lifestyle values.

A number of uses and key management issues exist in the Channel and lower Huon waterways, including:

- » **Rapid population growth** with associated sewage and stormwater discharges and clearance of foreshore vegetation
- » **Catchment activities**, including agriculture and forestry, and associated sediment and nutrient inputs via creeks and streams
- » **Development of aquaculture** (finfish and shellfish) and associated inputs of nutrients and organic matter
- » **High levels of recreational boating and fishing**

- » **Increasing numbers of introduced marine pests and weeds**, including toxic algal species resulting in periodic shellfish closures
- » **Risks associated with climate change** including shoreline erosion, flooding and loss of coastal habitats due to sea-level rise, and changes in flora and fauna community composition
- » **Coastal degradation** due to vegetation loss, ongoing erosion and weed infestations

The Channel and Huon Estuary are important to a range of people and businesses. The waterways are of great natural beauty, and are central to the environment, heritage, social and economic growth of the area. Sustaining healthy waterways now and in the future requires balancing the needs of all users and a collective effort in understanding and managing this marine environment.

THE D'ENTRECASTEAUX CHANNEL PROJECT

The D'Entrecasteaux Channel Project is a collaboration between local and state government agencies, non-government organisations, research institutes and industry to sustainably manage the D'Entrecasteaux Channel and lower Huon Estuary.

INTERNATIONAL RIVERFOUNDATION'S TWINNING PROGRAM



The D'Entrecasteaux Channel Project has been linked with the Derwent Estuary Program as part of the International River Foundation's Twinning Program. The program allows winners of the International River Foundation's Riverprize, to link with another organisation to help them achieve their river restoration goals.

As a recipient of the 2010 Australian Riverprize, the Derwent Estuary Program is recognised as a leader in river management and restoration. Being part of the Twinning Program provides an excellent opportunity for the stakeholders of the D'Entrecasteaux Channel to learn from the success and challenges of restoring the neighbouring Derwent Estuary.

NATURAL AND HERITAGE VALUES

A wide range of aquatic life exist in the waterways due to the presence of diverse marine, estuarine and foreshore habitats. Habitats are dominated by soft sediments, like sand and mud, but also include highly productive seagrass and kelp (seaweed) beds, rocky reefs and saltmarshes.

Forty-five state reserves (e.g. South Bruny National Park, Putalina Indigenous Protected Area, and Ninepin Point Marine Protected Area) have been declared in the waterways and along the coast; to conserve the marine environment, significant species, and indigenous and historical sites.

A range of threatened and endemic animal and plant species occur in the waterway and along the coastline including the spotted handfish, seastar species and highly restricted algae (or 'seaweeds'). Some of the endemic species are only found in the Channel and Huon Estuary, while seven of the vegetation types in the coastal zone are threatened.

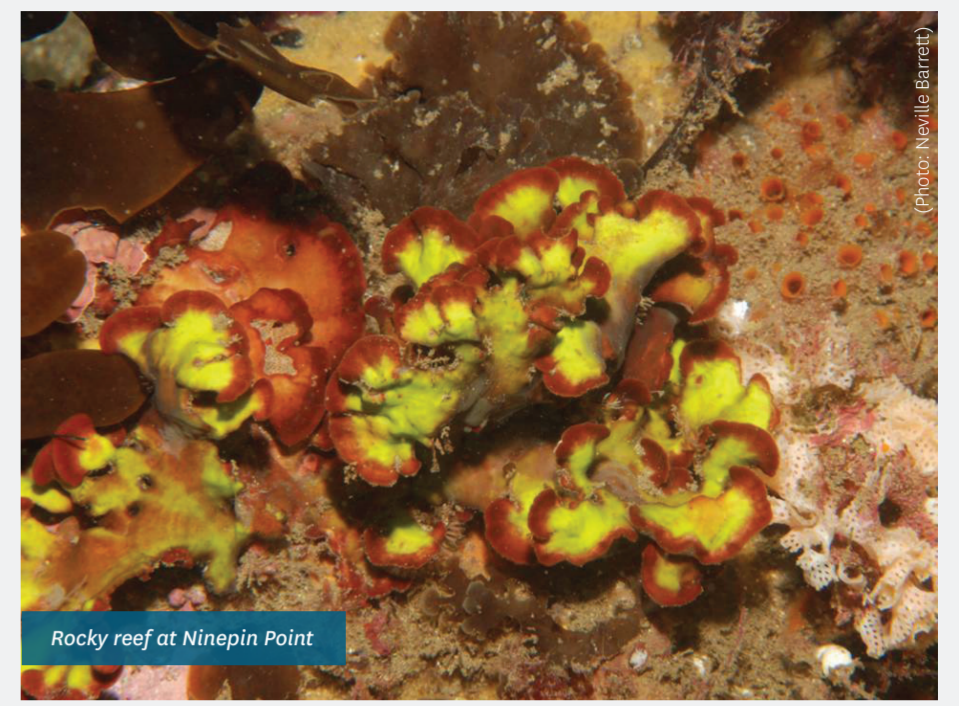
A high proportion of the foreshore is rated as moderate to high geoconservation value and contain 24 listed sites, including several nationally classified geological monuments. At least 600 Aboriginal heritage sites are concentrated along the coastline and approx. 65 European heritage sites occur in the Channel area, including historic shipwrecks.

DID YOU KNOW?

100% of sewage from the Howden Wastewater Treatment Plant is reused at the local golf course, preventing sewage wastes from this location entering North West Bay.

DID YOU KNOW?

Unique and diverse communities of fragile and delicate benthic invertebrates (organisms that live in or on seafloor sediments), such as sponges, seafans and seawhips, occur at much shallower depths than normal, in the lower Huon Estuary due to the presence of naturally dark tannic waters.



Rocky reef at Ninepin Point

DID YOU KNOW?

The primary source of nutrients to the D'Entrecasteaux Channel and lower Huon Estuary are naturally occurring and from the Southern Ocean, particularly during winter months. However, during summer, nutrient inputs are dominated by aquaculture, sewage and riverine sources.

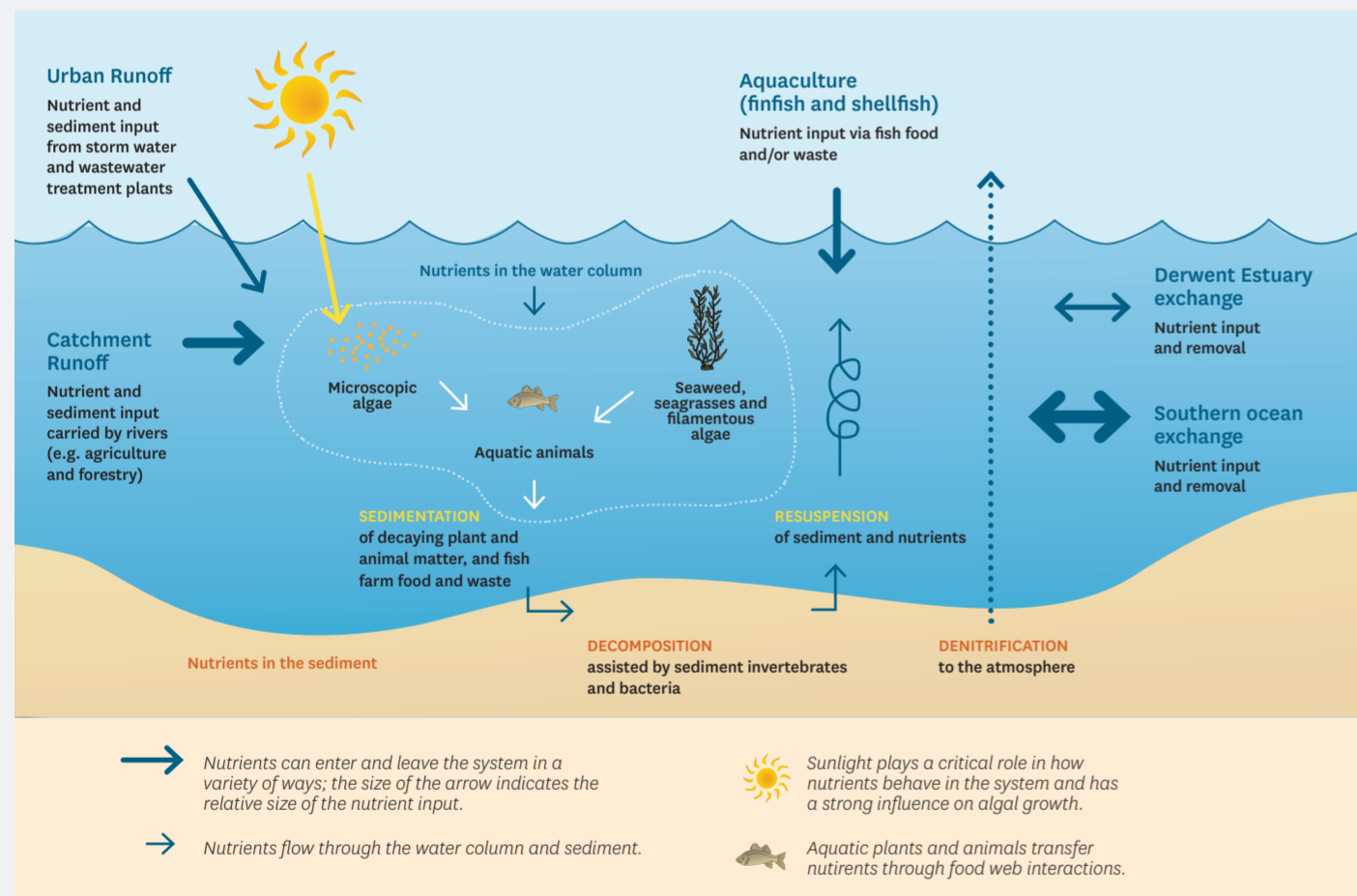
WATER QUALITY

Water quality across the system remains relatively healthy but localised impacts are evident. The primary nutrient source to the waterways occurs naturally from the neighbouring ocean. There is evidence of oxygen depletion, and nutrient and ammonia enrichment, in areas including the Huon Estuary.

Water quality conditions are generally suitable for primary recreational activities, such as swimming, snorkelling and diving. Occasional periods of localised and short-term bacterial contamination, associated with high rainfall, occur at beaches adjacent to urban areas. Metal concentrations have been investigated in the Huon Estuary and are low in most areas, but have not been extensively surveyed in the Channel. A long-term increase in phytoplankton (microalgal) biomass across the region is evident and blooms of toxic algae are a concern for the region.

HUMAN-DERIVED INPUTS

Contaminants enter the Channel and lower Huon via a variety of sources, including: wastewater treatment plants, fish processing plants, finfish farms, stormwater and septic outflows, tips and contaminated sites, quarries, catchment inputs from rivers (e.g. forestry and agricultural runoff), and marinas and other boating wastes. The largest human-induced sources of nutrients to the waterways are fish farms and catchment inputs via river water.



NUTRIENT CYCLING

The cycling of nutrients (nitrogen and phosphorus) in estuarine and coastal systems is complex and linked to many biological, chemical and physical variables. Nutrients enter the Huon Estuary and D'Entrecasteaux Channel via natural sources as well as various human-derived sources. In general, nutrients are taken up by aquatic plants and algae, deposited and reprocessed within sediments, and transported to coastal waters; however, additional removal can occur via loss to the atmosphere as dissolved gases (denitrification).

The diagram above illustrates the flow of nutrients in the D'Entrecasteaux Channel and Huon Estuary.



Margate rivulet saltmarsh



Salmon farms North West Bay

SEDIMENT QUALITY

Marine and estuarine sediments of the D'Entrecasteaux Channel and lower Huon Estuary include a mix of sand and fine, silty particles, depending on depth, currents, wind and wave exposure.

The majority of sediments in the region are healthy; however, localised oxygen depletion and elevated organic content indicate degradation in some areas, particularly in the lower Huon Estuary and North West Bay. Regulatory sediment health monitoring conducted at all finfish lease areas has shown that high organic loadings at

these sites are confined to under cage sites. Sewage treatment plant impacts, while a small contributor to the overall organic content, are mainly confined to the immediate vicinity of some urban centres and wastewater discharge outfalls.

Low to moderate levels of sediment contamination by metals occur in localised areas, including the former pulp mill site at Hospital Bay, in the vicinity of sewage outfalls, and associated with the use of copper-based antifoulant paints at some fish farms, and localised tributyltin contamination in some marina environments.

DID YOU KNOW?

The salmon farming industry is aiming to replace the use of copper-based antifoulants with in-situ cleaning technology at all sites during 2013.

SEAFOOD SAFETY

Shellfish such as oysters and mussels are filter feeders and tend to accumulate pathogens, biotoxins and other contaminants at a higher rate than other seafood species; therefore are the primary concern for seafood safety. Surveys performed in the region during 2000-2011 indicated that elevated levels of biotoxins from harmful algal blooms and the presence of faecal bacteria indicators were the main factors resulting in shellfish farm closures. Sites in the lower Huon are at the highest risk from biotoxins associated with harmful algae, and are of an ongoing concern to the bivalve shellfish farming industry. Levels of metals and pesticides in shellfish and flathead from this area have been found to be within the guidelines for seafood safety, but monitoring is limited.

There are currently no recommended limits regarding consumption of finfish in the D'Entrecasteaux Channel and Huon Estuary. However, when consuming fish it is important to follow the advice of Food Standards Australia New Zealand, at: <http://www.foodstandards.gov.au/consumer/chemicals/mercury/Pages/default.aspx>. There is a standing public health advisory in Tasmania warning against eating wild oysters and mussels because it can be a high risk activity in unmonitored areas.

FORESHORE ENVIRONMENT

The foreshore of the waterways has great scenic and recreational value and is utilised by marine farming, tourism, commercial fishing vessels, processing and other industries.

More than 40% of the foreshore has been assessed as moderately to highly modified from its natural state, due to native vegetation clearance and pressure from human activities.

The large number of structures along the coastline reflects a strong focus on marine industries and the popularity of the waterways for recreational activities.



New Zealand screwshell



Shoreline erosion at Snug

MARINE PESTS AND COASTAL WEEDS

There are currently 49 known introduced marine species in the D'Entrecasteaux Channel and lower Huon Estuary, including six 'target' introduced pest species, as categorised by the Australian Marine Pest Monitoring Manual: northern Pacific seastar, dead man's fingers (green seaweed), feral Pacific oyster, toxic microalga, Japanese seaweed and the European clam. The toxic microalga, New Zealand screwshell and the northern Pacific seastar have become dominant members of the community and pose a significant threat to native marine species and habitats.

The coastal areas of the Channel and lower Huon support a variety of weed species that impact on the health and integrity of native plant and animal communities, and have a negative effect on social, economic and conservation values.

Coastal weeds are present in nearly 60% of foreshore areas, with common species including blackberry, radiata pine, montpellier broom, Spanish heath, gorse, boneseed, briar rose and marram grass.

CLIMATE CHANGE

Regional risks associated with climate change include shoreline erosion, ecosystem changes, flooding, and landward movement of mobile coastal landforms and vegetation due to sea level rise. Recent geomorphological mapping has indicated that many areas in the region are highly vulnerable to these risks, particularly around Margate, Snug, Great Bay, Bruny Island Neck and the mid-Channel. The frequency and severity of storm surge events relative to current sea level and coastal infrastructure are predicted to increase.

Saltmarshes and other coastal habitats are also at risk of decline where there are physical barriers, such as roads, that will restrict their movement inland as the high tide mark shifts with rising sea levels. Changes to water temperatures and chemical properties may also affect the composition of marine and estuarine plant and animal communities. Some changes are already being noticed including an increase in the distribution of species such as the long-spined sea urchin; with this being a threat to kelp beds and recreational fish species.

FOR FURTHER INFORMATION:

Contact the D'Entrecasteaux Channel Project Coordinator
Kingborough Council
15 Channel Highway, Kingston TAS 7050
P. (03) 6211 8200
F. (03) 6211 8211
E. kc@kingborough.tas.gov.au
www.kingborough.tas.gov.au

Acknowledgements
Dr Karen Parsons,
Ecomarine Consulting

D'Entrecasteaux Channel Project
Steering Committee and
Scientific and Technical Working Group