PITT WATER ORIELTON LAGOON

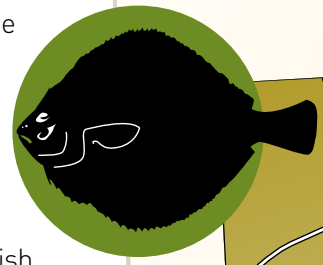
A report to the community

A remarkable estuary under pressure

Bar-tailed godwit. Photo: Alan Fletcher

This Report to the Community seeks to highlight the values and condition of the estuary, improvement works being undertaken and further actions required. While this remarkable estuary is under pressure, there are many things that can be done to ensure this natural asset continues to be enjoyed by future generations.

A haven for marine life



Pitt Water and Orielton Lagoon are part of one large shallow estuary, sheltered from the ocean by the Seven Mile Beach spit.

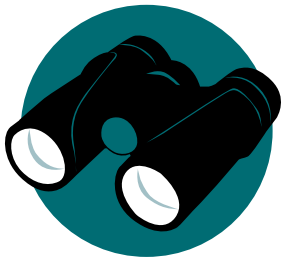
More than 40 fish species are drawn to the sheltered waters to feed on seagrass, invertebrates and other fish. Fish frequently seen include gummy shark, eagle ray, silverfish, sand flathead, whiting, flounder, Australian salmon and mullet. There are also eel, school shark, seahorse, pipefish, sculptured sea moth, king barracouta and silver trevally.

A rich source of food attracting birds from far away

Seven or more species of migratory birds fly from as far away as Alaska to feed on the mudflats of Pitt Water and Orielton Lagoon during summer.

The eastern curlew, which breeds in Russia and north-eastern China, is the largest migratory wader to visit Australia. It has a long curved bill to find crabs and other animals living in the mudflats.

The estuary is the southern-most site on the East Asia – Australasian Flyway, a major international waterbird migration corridor.



A place people love to be

For tens of thousands of years the estuary was the territory of the Moomairremener band of the Oyster Bay Tribe. Other Aboriginal bands of the Big River tribe visited the area to harvest the rich resources. There are numerous middens of native oyster shells, artefacts and quarries throughout the Lagoon area.

Today, people enjoy fishing on the southern side of McGees Bridge and bird watching at Sorell Causeway, Forcett Street and Waterview Sanctuary.

A home for unique animals

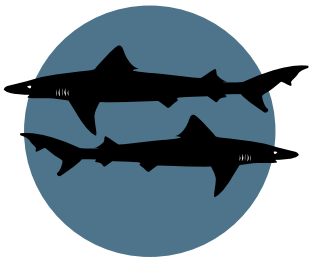
Parvulastra vivipara is one of very few seastars in the world that give birth to live young. The tiny orange animal is found at only five places in south-east Tasmania. Pitt Water has the largest population.

A rare butterfly lives in the saltmarshes – the saltbush blue or chequered blue butterfly. The larvae feed on Rhagodia and similar saltmarsh plants in the upper zones of saltmarshes.

A hot spot for saltmarsh diversity

The region is one of the most significant areas of saltmarsh in Tasmania, with a great diversity of plants including 10 rare species.

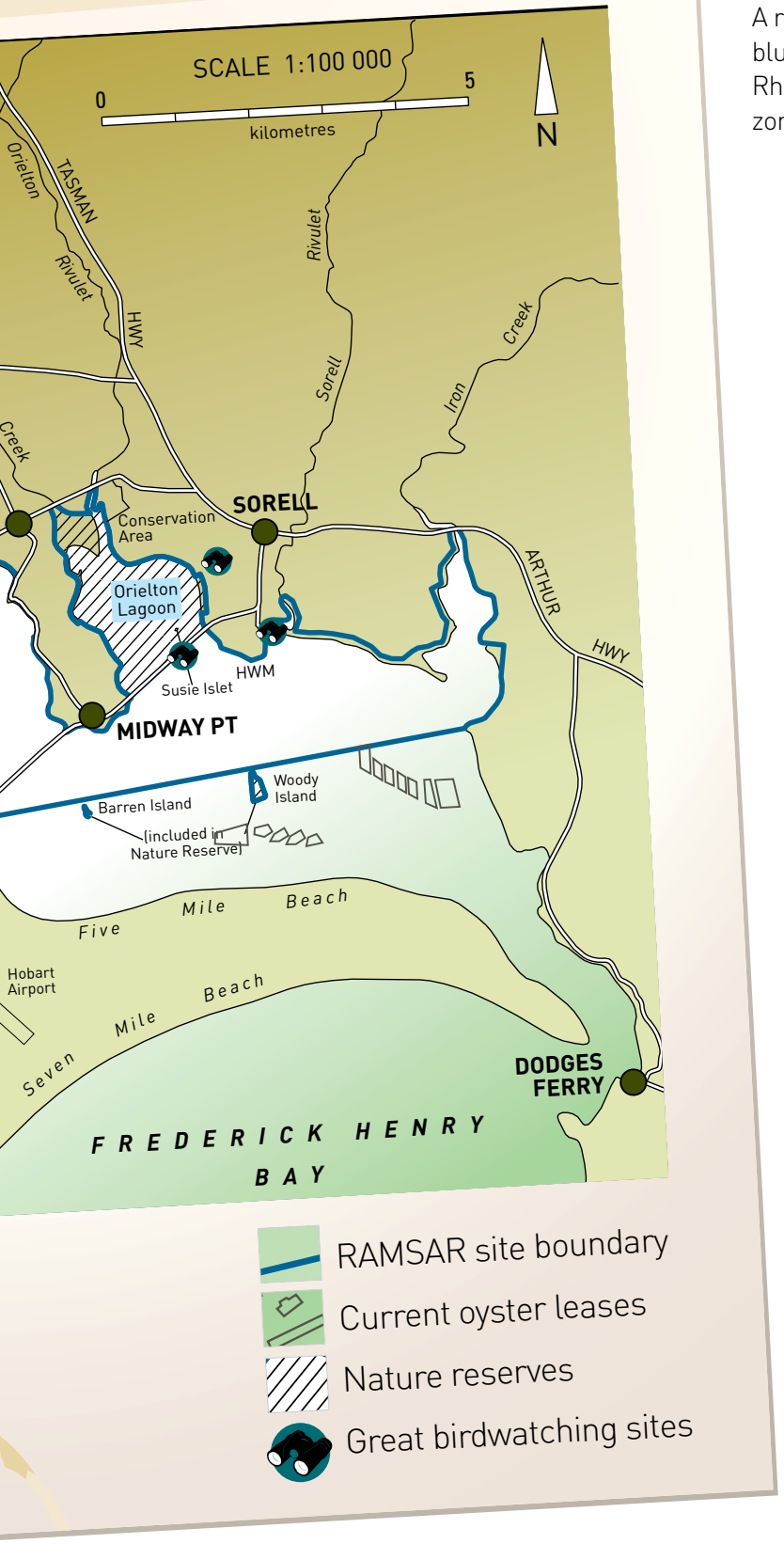
Saltmarshes provide roosting and foraging habitats for birds and small animals. They also help maintain the water quality by taking up nutrients and trapping sediment from water flowing into the estuary.



A nursery for commercial fish species

The estuary is a key breeding area for several shark species and a nursery for juvenile sharks, including commercially harvested school shark and gummy shark. In 1995 Pitt Water was declared a shark refuge and is a no-take area.

There are Pacific oyster farms at several locations: near Shark Point, Barilla Bay, and south and east of Woody Island.



An internationally recognised Ramsar site

The many values of the estuary were recognised in 1982 when much of the area was listed as a wetland of international importance under the Ramsar Convention on Wetlands. The Nature Reserve protects key areas in the Ramsar site.

THE CONDITION OF THE ESTUARY

Animal and plant populations vary naturally in response to changing climate and environment, but at Pitt Water-Orielton Lagoon human activity near the estuary and its catchment are the main drivers of change. There are gaps in the data available and there are few long term records, but the overall trend of declining condition is clear. Over the past few decades wildlife numbers have declined, key vegetation species have receded, and water quality has deteriorated.

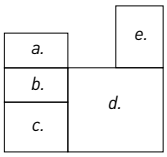
The area and condition of saltmarsh has decreased

Since 1975, 5% of the saltmarsh has been lost due to erosion resulting from sea level rise, and 18% was lost because of habitat modification and land reclamation.

Nearby agricultural activity has affected the health of the saltmarsh. Large areas have been cut off from tidal influence by levees. Nutrients from fertilisers draining into the saltmarsh stimulate algal growth that smothers the plants. Dams and reservoirs reduce the flow of freshwater and sediment into the saltmarsh.

In many areas the dominant plants have changed or died largely due to climate change and sea level rise, leaving bare ground.

Fortunately, saltmarsh is returning to Orielton Lagoon following modification of the causeway to allow for tidal flushing, and reduced pressure from fire and grazing.



a. Round-leaved pigface

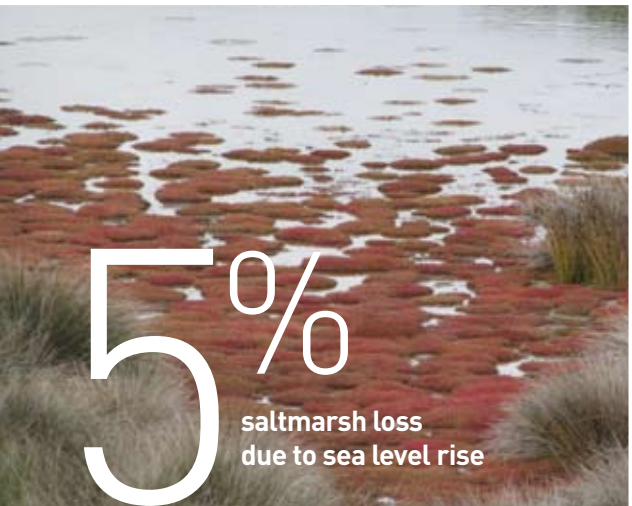
b. Selliera & trailing hemichora

c. Saltmarsh

d. Red-necked stints feeding on the saltmarsh

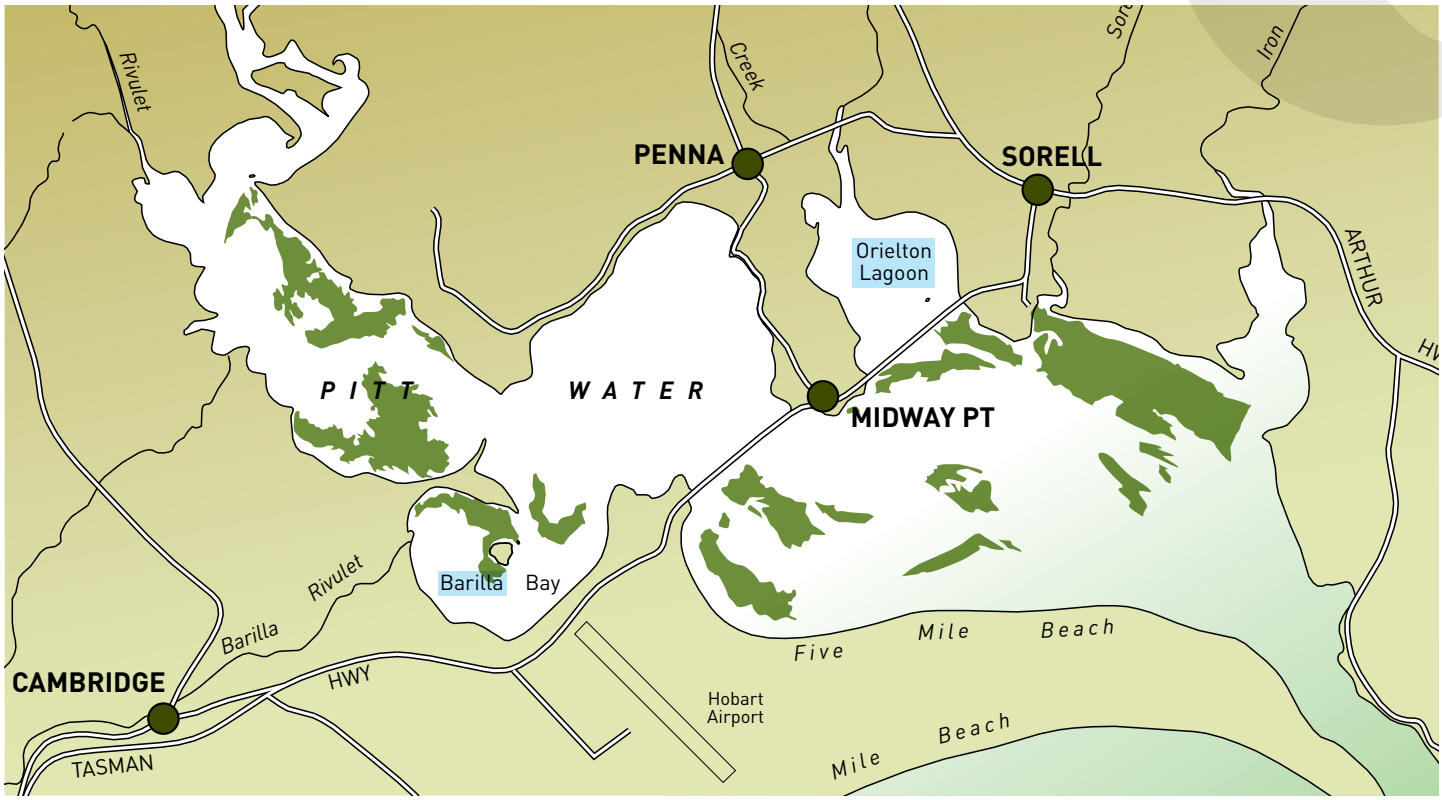
e. Harlequin bug on saltbush

Photos: Vishnu Prahalad



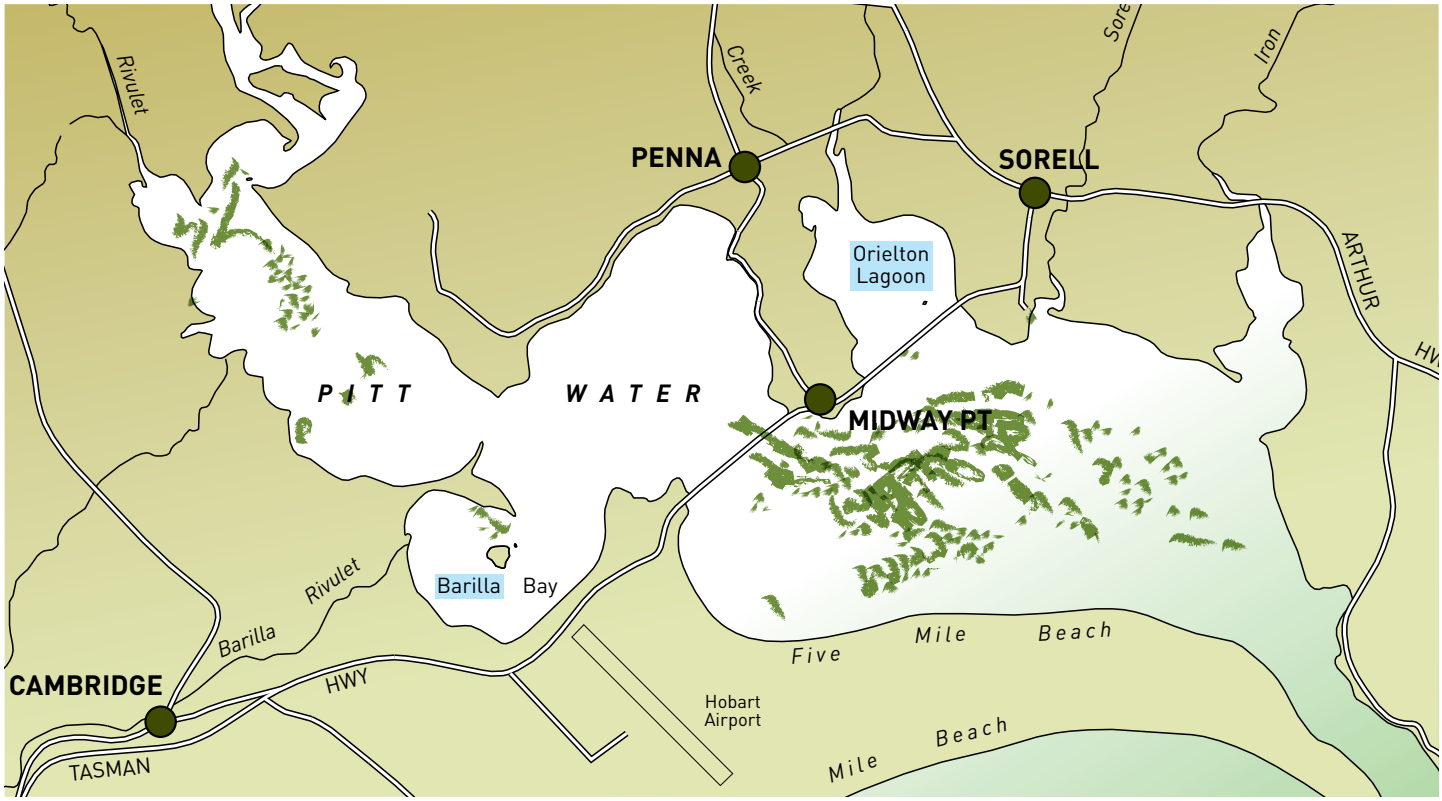
The area of seagrass has decreased

Aerial photography indicates that in 1970 substantial areas of seagrass were found on the northern and southern side of the causeways. Marine habitat mapping by SEAMAP Tasmania in 2005 found only small patchy areas of seagrass north of the causeways.



Seagrass distribution in Pitt Water Orielton Lagoon in 1970.

1970 seagrass



2005 Seagrass distribution.

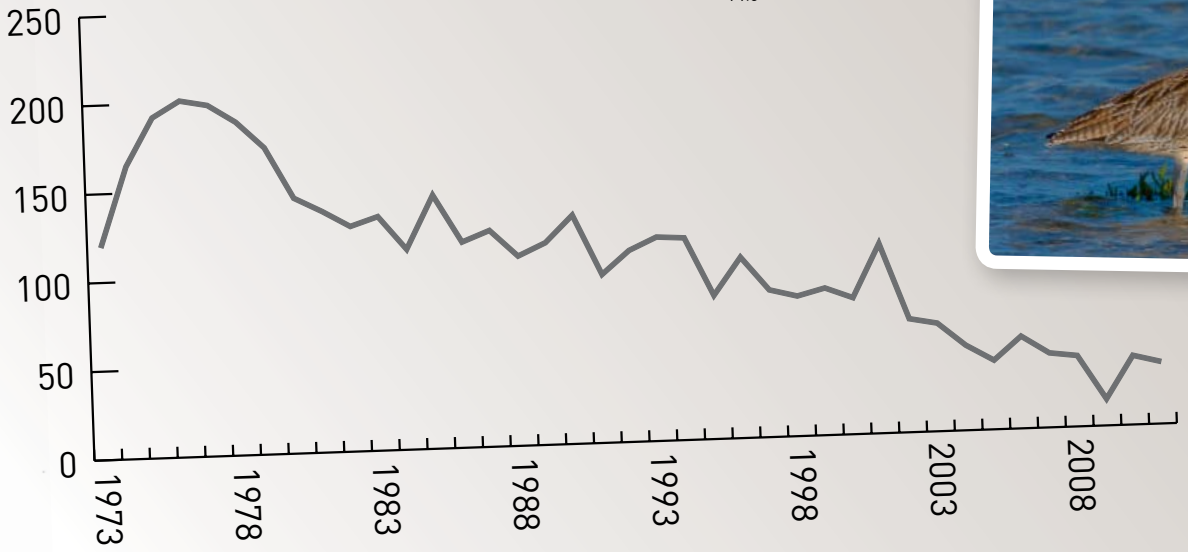
2005 seagrass

Sources: Rees 1996 and SEAMAP 2005 Tasmania.

Migratory bird populations are decreasing

Migratory birds are decreasing due to habitat loss along the international flyway and reduced breeding or survival of young birds. As a consequence the numbers of curlew sandpiper, eastern curlew, Pacific golden plover and double-banded plover reaching Pitt Water-Orielton Lagoon have decreased significantly since 1965. Since Pitt Water-Orielton Lagoon is an important link in the flyway, protecting it is crucial.

Eastern curlew numbers



Source: Birds Tasmania

Right: Eastern curlew
Photo: Alan Fletcher

Seastar numbers are decreasing

The range of the live-bearing seastar has contracted and the numbers at each site are decreasing.

Introduced species are invading

Non-native marine species such as the northern Pacific seastar, the European shore crab, a toxic dinoflagellate microalgae and some feral populations of Pacific oyster have become established in the estuary.

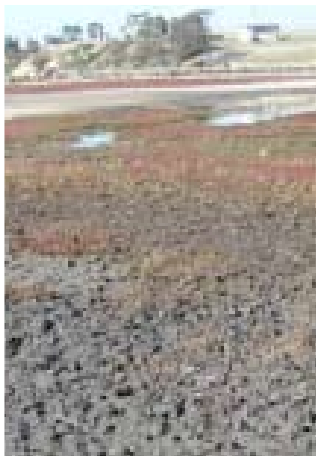
Kelp gulls from New Zealand and domestic ducks compete for resources with native birds. Rabbits graze the saltmarsh and other coastal vegetation. Cats and dogs chase and attack birds and stock trample vegetation and nests if they aren't carefully managed.

Weeds such as African boxthorn and boneseed have invaded the foreshore, particularly on the northern shore between Penna and Iron Creek.

Fish numbers appear to be decreasing

While there have been no scientific studies of fish numbers in the estuary, there is information that suggests that the diversity and abundance of fish are decreasing.

Passionate amateur naturalist and long-time resident of Midway Point Geoff Prestedge has noted that since 1975 almost all fish species have declined in number. The banded stingaree, southern conger eel, shot-headed eel, rock ling, pipefish, soldier fish, rock flathead, king barracouta, weedfish and smooth toadfish used to be abundant, but by 1995 were rare or not seen at all. Mr Prestedge has also observed significant decreases in the abundance of a wide range of invertebrates (snails, worms, molluscs) over the same time period.



a.	b.	c.

a. *Endemic and vulnerable Live-bearing seastar Parvulastra vivipara. Photo: G Edgar*

b. *Wader flock. Photo: Alan Fletcher*

c. *Saltmarsh trampled by stock. Photo: Helen Dunn*

Water quality and algal blooms

Not so long ago there were frequent, smelly algal blooms in Orielton Lagoon. This problem was substantially alleviated when Sorell Council reduced nutrient loads flowing into the lagoon. The Midway Point sewage treatment plant was upgraded in 1992 and in 2007 effluent was diverted from the lagoon to irrigation in the Penna Reuse Scheme. In 1998 the culverts in Sorell Causeway were modified to improve tidal flows in and out of the lagoon.

A study in 2005 demonstrated that the numbers and diversity of small crustaceans and worms had increased significantly, however algal blooms and occasional odours still occur in Orielton Lagoon and near Five Mile Beach, probably in response to high levels of nutrients.

The oyster industry has monitored bacteria, salinity, temperature and rainfall at marine farm sites throughout the estuary since 2004. Their data show that water quality is generally good, except that faecal bacteria levels can increase after rainfall (in which case there is no harvesting).

Filamentous algae smothering saltmarsh shrubs, Coal River. Photo: Vishnu Prahalad

NRM South commissioned the Tasmanian Aquaculture and Fisheries Institute to monitor a broader range of parameters in five estuaries for one year. The data showed good levels of dissolved oxygen and moderate levels of turbidity, however nutrient levels were of concern. High nutrient levels can stimulate the growth of algae and algal blooms that can smother plants, consume oxygen in the water, smell and sometimes release toxins. Phosphorus levels were frequently well above threshold levels. Nitrate and nitrite levels were generally low, except for one peak considerably above the expected threshold for this type of estuary.

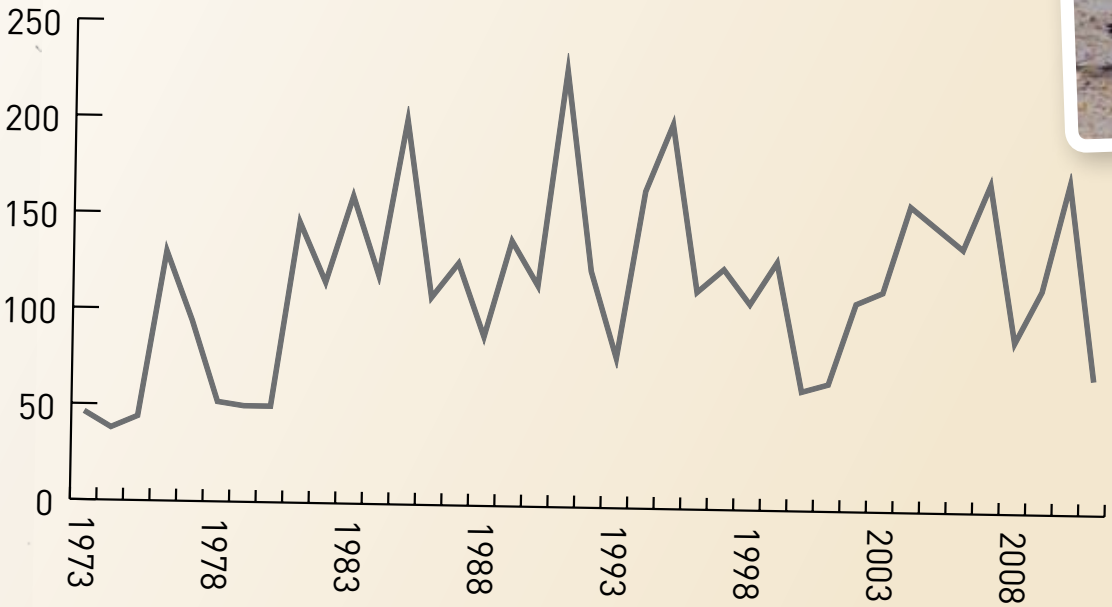
Good news for resident birds

Birds Tasmania volunteers have been recording resident and migratory bird numbers in the estuary for decades. Thanks to their hard work we know that the numbers of pied oystercatchers, red-capped plovers and masked lapwing vary naturally among seasons, but overall have not changed significantly since 1979.

Resident birds move among the estuary and other nearby sites including Pipe Clay Lagoon, Clear Lagoon and Marion Bay depending on food resources and conditions.

Above: Pied oystercatcher
Photo: Alan Fletcher

Pied oystercatcher numbers



Source: Birds Tasmania

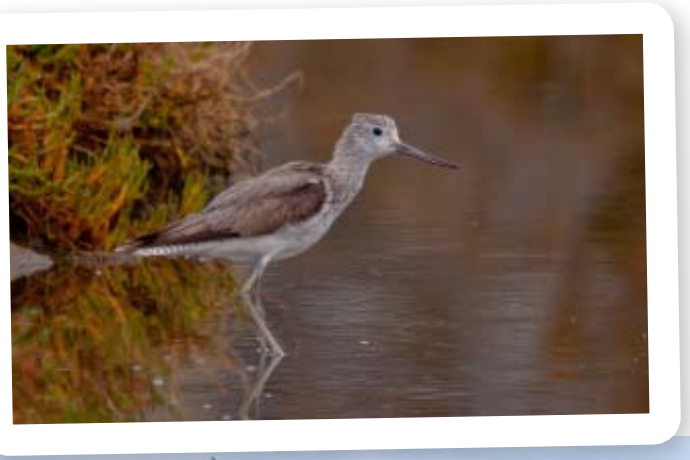
WHAT HAS CAUSED THE DECLINE IN CONDITION?

Sediment flowing into the estuary has increased

Clearing for agricultural activity in the catchment and stormwater flow in urban areas has resulted in more sediment flowing into the estuary. The upper reaches are now far shallower than they were. In the 1830s George Wray regularly sailed a 26 ton sloop called Richmond Packet between the Richmond wharf and Hobart transporting grain and other cargo. Sediment may have contributed to the decline of seagrass by smothering it, reducing photosynthesis. Sedimentary soils near the estuary are prone to erosion, particularly those on Permian mudstone or Triassic sandstone.

The causeways have altered tidal flow

Tidal flow into Orielton Lagoon is restricted by Sorell Causeway, reducing flushing of nutrients and sediments. Incoming tides are channelled under McGees Bridge into Upper Pitt Water. The Midway Point causeway alters flow into upper Pitt Water.



Dam construction reduces fresh water flows

Craigebourne dam and other smaller farm dams store winter flows for summer irrigation, altering the timing and size of peak flows. Almost every major creek draining into the saltmarshes has been dammed, which reduces the frequency and volume of winter floods. No scientific study has assessed the impacts, although dams are thought to be contributing to the decline of saltmarsh plants, changing reproduction or migration of fish such as whitebait, and accumulation of sediment in the estuary due to less frequent freshwater flushes.

Urban development and agricultural activity have increased nutrient and bacteria levels

Urban sources of nutrients and bacteria include stormwater and effluent from leaking septic tanks and sewage treatment plants. Nutrients can be washed out of soils cleared for pasture and crops, especially where fertiliser is applied. Soil erosion in the catchment has been linked to high phosphorus loads.

People, pets and stock damage vegetation and disturb breeding birds

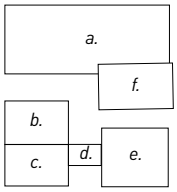
Birds nesting on the foreshore are easily disturbed by vehicles or even people walking close to their nests; cats and dogs chase and attack birds. Walking, cycling and stock trampling can cause sustained damage to saltmarsh and other coastal vegetation. Rubbish dumping is a hazard for wildlife.

a.
b.

Top: Double-banded plover. Photo: Alan Fletcher

a. Common greenshank. Photo: Alan Fletcher

b. Building fences helps to protect saltmarsh. Photo: Andry Sculpthorpe



a. *Midway Point. Photo: Sorell Council*

b. *Eroding banks at Coal River. Photo: Barry Hardwick*

c. *African boxthorn invading saltmarsh. Photo: Andry Sculthorpe*

d. *Southern Beaches Coastcare members working to revegetate Spectacle Islands. Photo: Gwen Egg*

e. *Aboriginal Midden. Photo: Andry Sculthorpe*

f. *Sorell Creek flows into Lower Pitt Water. Photo: Vishnu Prahalad*

WORKING TOGETHER TO IMPROVE THE CONDITION OF PITT WATER-ORIELTON LAGOON

a. b.

a. *Birds Tasmania helps students with observations. Photo: Andry Sculpthorpe*

b. *Sorell Primary School working to revegetate and control weeds. Photo: Moya Sharpe*

The good news is that there are signs of improvement in the condition of the estuary. Recent actions have been funded by the Australian Government's *Caring for our Country* initiative.

Protecting shorebirds

- NRM South, Parks and Wildlife Service, Sorell Council and Birds Tasmania have built fences, controlled weeds and installed signs to protect shorebirds.

Restoring habitat

- NRM South, Sorell Council and Parks and Wildlife Service, Conservation Volunteers Australia and the community have been protecting saltmarsh and removing weeds from the foreshore.*
- The Coal River Products Association has been removing willows and African boxthorn, planting native species and building fences to protect banks and reduce erosion in the Coal River and the upper estuary.
- Southern Beaches Landcare/Coastcare members have been active, improving beach access to minimise impact on dunes, controlling weeds and planting native species at many sites around Dodges Ferry including Spectacle Islands, Red Ochre Beach, Blue Lagoon, Carlton Bluff, Samuel Thorne Reserve and Jacks Flat.
- Students from Sorell Primary School have been controlling weeds and planting native species at Waterview Sanctuary, Blue Lagoon and Park Beach.
- Penna Landcare Group has been controlling African boxthorn and boneseed in the Penna area.
- Clarence Council plans to remove willows from Barilla Rivulet.

Best practice agriculture

- The Coal River Products Association has been trialling best practice agriculture techniques to improve soil and pasture management.
- NRM South runs sustainable farming workshops for landholders in the area.*

Stormwater management and sewage treatment

- Sorell Council has installed stormwater treatment devices at Midway Point. NRM South and Sorell Council have constructed a stormwater swale at Forcett Street and prepared a Stormwater Management Strategy.*
- Southern Water is considering options to improve the Sorell, Midway Point and Cambridge sewage treatment plants to improve effluent quality and increase the use of effluent for irrigation.

Research and planning

- The Parks and Wildlife Service has updated the management plan for the Pitt Water Nature Reserve.
- A scientific report describing the ecological character of the Ramsar site has been prepared by the Minister for Sustainability, Environment, Water, Populations and Communities.
- NRM South prepared a Foreshore Action Plan that identifies key actions to protect bird nesting and rookery sites, saltmarsh and coastal vegetation. *

** Denotes projects funded by the Caring for our Country initiative.*

MORE ACTION IS NEEDED

Although some changes to the estuary are now irreversible, there is plenty we can do to protect the remaining values and improve the overall condition of the estuary. Government, community, industry and researchers each have a role to play. Here are some key actions we can undertake that can make a difference.

- Manage irrigation and other water use to minimise diversion of surface water flows from the estuary.
- Improve the performance of sewage treatment plants and septic tanks to minimise nutrients and faecal bacteria entering the estuary.
- Improve the design of urban environment and stormwater treatment systems to reduce sediment and nutrients flowing into the estuary in stormwater.
- Improve pasture management and control the application of fertiliser to reduce nutrients and sediment flowing into the estuary.
- Allow for the natural movement of saltmarsh on the landward edges in response to sea level rise.
- Watch birds from a safe distance (at least 50m). Use binoculars and keep to the designated tracks.
- Walk dogs on-leash so they don't disturb birds.
- De-sex cats and keep them in at night.
- Record and report algal blooms.
- Protect coastal vegetation, reduce erosion and control invasive weeds
- Join a coastcare or landcare group.

We need to know more

Monitoring and research is required to better understand the hydrology, sedimentation processes, water quality of the estuary and changing numbers of animals and plants.

How you can get involved

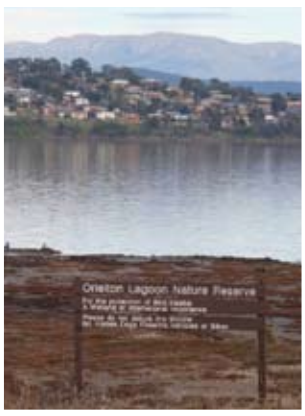
If you can help out please contact NRM South on 6221 6111 or Sorell Council on 6269 0000.

a. *Pacific Golden Plover. Photo: Alan Fletcher.*

b. *Orielton Lagoon is right on Hobart's doorstep. Photo: Stuart Pengally*

c. *Sorell Primary School work with Conservation Volunteers. Photo: Andry Sculpthorpe*

d. *Conservation Volunteers clear Boxthorn from the shores of Orielton Lagoon. Photo: Andry Sculpthorpe*



FOR MORE INFORMATION:

- The Parks and Wildlife Service management plan for the Pitt Water Nature Reserve is available at **www.parks.tas.gov.au**
- To learn more about the birds in the Pitt Water-Orielton Lagoon, contact Birds Tasmania batas@birdsaustralia.com.au
- Contact NRM South: **www.nrmsouth.org.au** or phone 6221 6111

Acknowledgements:

This report was prepared by NRM South with support from the Australian Government's *Caring for Our Country* Initiative.

A key reference for this report is the Pitt Water-Orielton Lagoon Ecological Character Description prepared by Dr Helen Dunn for the Department of Sustainability, Environment, Water, Population and Communities.

CARING FOR OUR COUNTRY

Tasmania

SORELL COUNCIL

Below: Glasswort herb, flowering.
Photo: Vishnu Prahalad