

ESTUARY ASSESSMENT FRAMEWORK FOR NON-PRISTINE ESTUARIES

Estuary 653 (PEEL-HARVEY ESTUARY)

Estuary ID 653
Name PEEL-HARVEY ESTUARY
Location SOUTH WEST (UPPER)
Latitude / Longitude -32.5 115.7 **Datum** GDA94

Condition Assessment This estuary is in extensively modified condition
Initial Classification In the first stage of this condition assessment this estuary was classified as being severely modified.
Basis of Initial Classification This was based on the changes to the land use: agriculture.

Processed-Based Classification



The way Peel-Harvey Estuary functions is primarily a result of wave energy. It is a wave dominated estuary. This means that the estuary would have high sediment trapping efficiency; naturally low turbidity, salt wedge/partially mixed circulation and there is high risk of sedimentation.

Issues:



General Comments / Notes: Peel-Harvey has traditionally been seen as one estuary. However, the Water and Rivers Commission of WA has now classified it as two separate estuaries (Peel Inlet and Harvey Estuary) so that each one is linked to the River Basin from which it drains.

Notes, Data and Supporting Qualitative Text	Rating (1-4)	Data Confidence	References
STATE COMPONENT (OVERALL)	4	A	9

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ECOSYSTEM INTEGRITY INDEX		4	A
Eutrophication			
Chlorophyll a (µg/L) [median(80th)] HEAD			
Chlorophyll a (µg/L) [median(80th)] MIDDLE			
Chlorophyll a (µg/L) [median(80th)] MOUTH			
Chlorophyll a (µg/L) [median(80th)] AVERAGE			
Harmful algal blooms	<p>Prior to the opening of the Dawesville channel in 1994, blooms of the cyanobacteria, <i>Nodularia spumigena</i> occurred most years in the Harvey estuary , associated with elevated P levels in the Harvey River. Peel Inlet experienced extensive growth of extensive growth of macroalgae, the dominant species being <i>Cladophora</i>, and later <i>Chaetomorpha</i> and <i>Ulva</i>. Since completion of the Dawesville channel <i>Nodularia</i> blooms have ceased. However, there has been an increase in toxic cyanobacteria and dinoflagellate blooms in the lower Murray and Serpentine rivers. Recently, prolific growth of the marine cyanobacterium <i>Lyngbya majuscula</i> has occurred in Peel Inlet.</p>	4	
Turbidity [median(80th)]			
Turbidity (NTU or secchi depth) HEAD			
Turbidity (NTU or secchi depth) MIDDLE			
Turbidity (NTU or secchi depth) MOUTH			
Turbidity (NTU or secchi depth) AVERAGE			
Shellfish closures			
Fish/bird kills			

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Pathogens

Faecal coliforms (no/100mL) [median(80th)] HEAD

Faecal coliforms (no/100mL) [median(80th)] MIDDLE

Faecal coliforms (no/100mL) [median(80th)] MOUTH

Faecal coliforms (no/100mL) [median(80th)] AVERAGE

Average of median enterococci 1997-2000 is 9.5; average of median faecal coliforms 1997-2000 is 28.25; average exceedance of primary contact guidelines 34 days per year; average exceedance of secondary contact guidelines 3.5 days per year

2

A

1

Critical habitat loss

Anoxic and hypoxic events

Invasive species

Notes, Data and Supporting Qualitative Text

**Rating
(1-4)**

**Data
Confidence**

References

HABITAT CONDITION INDEX

Peel-Harvey Estuary was mapped in 2000 and the following facies areas were calculated: Barrier/back Barrier 26.7 sq.km; Central Basin 121.1 sq.km; Fluvial-bayhead delta 27.5 sq.km; Flood and ebb tidal delta 11.0 sq.km; Intertidal flats 2.8 sq.km; Saltmarsh/Saltflats 3.0 sq.km; Tidal sand banks 0.1 sq.km; Total facies area 192.1 sq.km. The following habitat deviations from expected were identified -1 / +1; no mangrove/contains tidal sand banks.

D

2

Seagrass species present

Halophila ovalis is the dominant seagrass; Heterozostera tasmanica is found near the Dawesville channel entrance and the Sticks Channel. Ruppia megacarpa occurs in significant stands

8

Seagrass coverage

Due to eutrophication-associated declines, Halophila ovalis and Ruppia are now much restricted in distribution

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Mangrove species present	None		
Mangrove coverage	0		2
Saltmarsh coverage	0.016		2
Wetland coverage			

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FISH CONDITION INDEX	Fish/crustacean species lists for this estuary present in AuditCapture database		D
Diversity			
Abundance			
Health			
Recruitment			

Notes, Data and Supporting Qualitative Text	Rating (1-4)	Data Confidence	References
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WATER QUALITY INDEX			D
Nutrients [median(80th)]			
Ammonia (µg/L) HEAD			
Ammonia (µg/L) MIDDLE			
Ammonia (µg/L) MOUTH			
Ammonia (µg/L) AVERAGE			
Oxidised nitrogen (µg/L) HEAD			
Oxidised nitrogen (µg/L) MIDDLE			
Oxidised nitrogen (µg/L) MOUTH			
Oxidised nitrogen (µg/L) AVERAGE			

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Phosphate (µg/L) HEAD

Phosphate (µg/L) MIDDLE

Phosphate (µg/L) MOUTH

Phosphate (ug/L) AVERAGE

Dissolved oxygen [median(20th)]

Dissolved oxygen [surface] (%sat or mg/L) HEAD

Dissolved oxygen [surface] (%sat or mg/L) MIDDLE

Dissolved oxygen [surface] (%sat or mg/L) MOUTH

Dissolved oxygen [surface] (%sat or mg/L) AVERAGE

Dissolved oxygen [bottom] (%sat or mg/L) HEAD

Dissolved oxygen [bottom] (%sat or mg/L) MIDDLE

Dissolved oxygen [bottom] (%sat or mg/L) MOUTH

Dissolved oxygen [bottom] (%sat or mg/L) AVERAGE

pH

Heavy metals

Are heavy metals a problem in this estuary (Y/N)?

Other toxicants (including pesticides)

Salinity

Temperature

Depth

Mean basin depth 1m

1

Notes, Data and Supporting Qualitative Text

**Rating
(1-4)**

**Data
Confidence**

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SEDIMENT QUALITY INDEX

D

Sediment toxicants

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Sediment load TN
 Sediment load TP
 Invertebrate diversity
 Invertebrate abundance

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PRESSURE COMPONENT (OVERALL)			D	
UTILISATION INDEX	1995 BRS data: Crop/pasture & Plantations comprise 32.7707 % of the catchment. Native woody vegetation comprises 47.7908 % of the catchment.		D	3
Recreation Pressure				
Aesthetic & Amenity	Present			9
Yachting & Boating	Yes			1
Shellfish	Yes. Mussels and some mud crabs due to changes in the Leewin current.			9
Swimming	Yes			9
Recreational Fishing	Yes			9
Infrastructure Pressure				
Sewage Treatment Plants	boat sullage ?			9
Urbanisation and urban runoff	Yes			9
Dredging	Yes, 5 licenses issued to industry in the last year.			9
Commercial Pressure				
Industry	Yes, definitely.			9
Aquaculture	Not yet but expression of interest.			9
Reclamation / Declamation	Yes.			9

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Commercial fishing	Yes but licenses are being reduced.	9
Tourism	Yes it is a tourist town.	9
Agriculture	Yes	9
Habitat clearing	Catchment 75% cleared.	7
Ports & Port Works	Yes, currently developing.	9
Shipping Activity	No	9

Notes, Data and Supporting Qualitative Text	Rating (1-4)	Data Confidence	References
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SUSCEPTIBILITY INDEX		D	
Flow-modifying structures	Harvey Weir and Stirling and Log [Harvey Weir] Reserve 15515		1
Catchment loads			
Flows and flushing	Naturally open year round		1
Acid sulphate soils			

RESPONSE COMPONENT (OVERALL)

Institutional Arrangements	WRC
Management Actions	
Community Initiatives	
Details of References	1. Auditcapture database (WA state data), 2. AGSO, 3. Derived from BRS landcover data 4. Environment Australia (2001). A directory of important wetlands in Australia, 5. Brodie, 1995, 6. Southern Metropolitan Coastal Waters Study, 7. Deeley and Paling, 1998, 8. Shepherd et al., 1989, 9. WA state contact
Key Contacts	