



# Elizabeth River and estuary report card 2009

Water quality at the upper estuary monitoring sites is in good condition, although some indicators do not comply with water quality objectives. Total nitrogen exceeds water quality objectives at the upper estuary monitoring site. Water quality at the ambient freshwater monitoring sites is in excellent condition and complies with water quality objectives. The water-bug community at some biological monitoring sites is better than or similar to the reference condition, but with several sites assessed as significantly or severely impaired.

## Nature of system

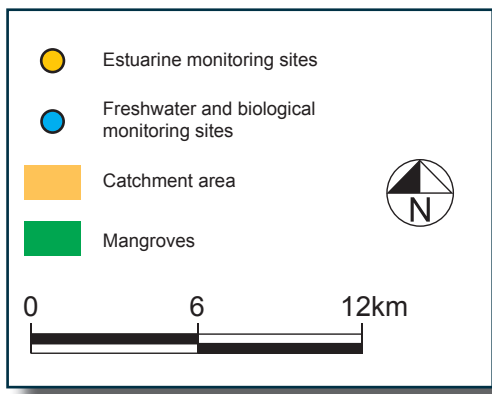
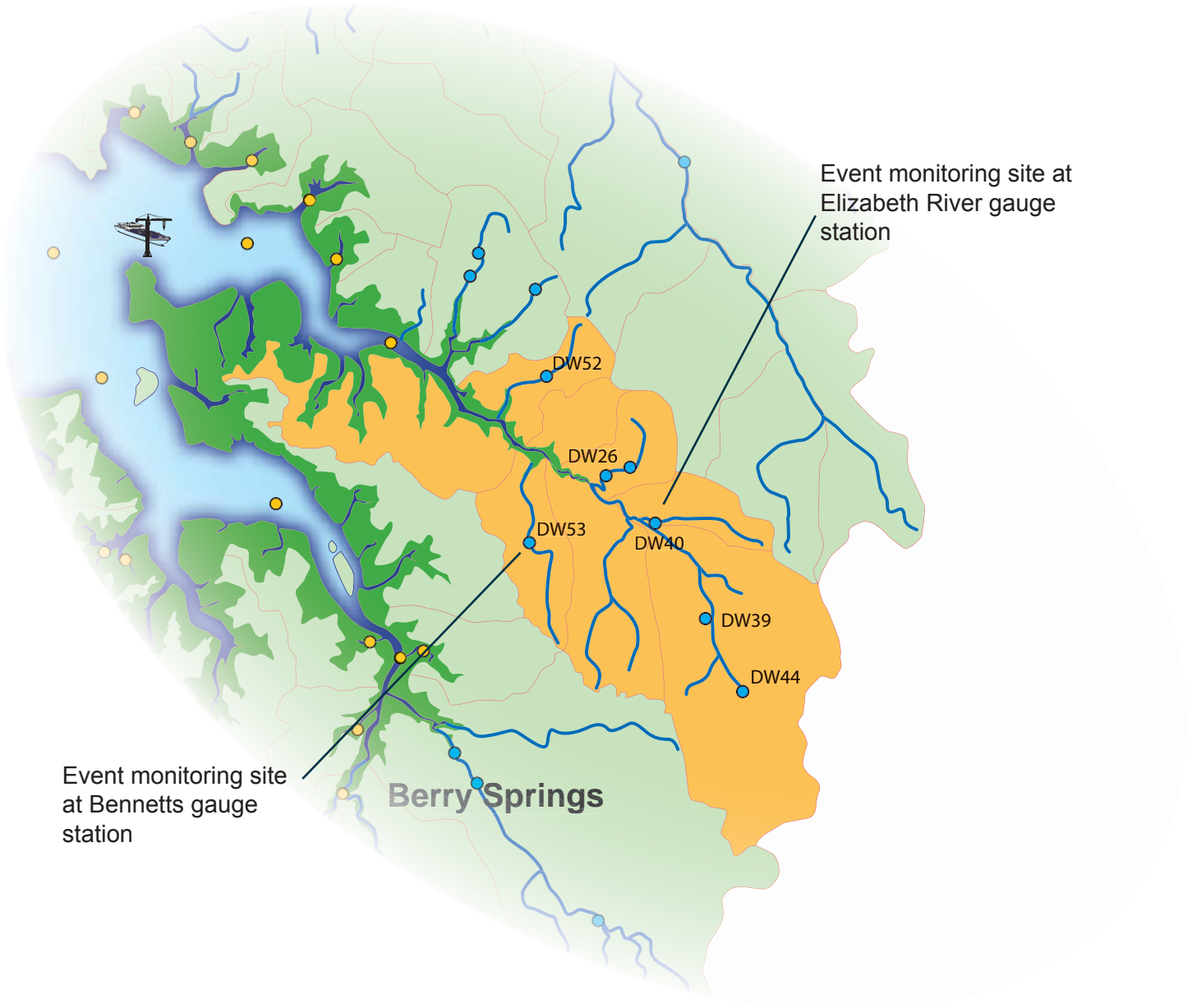
- Long residence time and poor flushing in the upper estuary
- Saltwater 'wedge' formation during the wet season – increasing freshwater flows to the estuary form a buoyant plume of freshwater which results in partially 'stratified' conditions
- Algal biodiversity greater in dry season
- Higher salinities in upper estuary during the dry season with no freshwater inputs
- Light limitation during the wet season

## Sources of pollution

- Sewage treatment plant wastewater discharge from Palmerston to Myrmidon Creek
- High sediment and nutrient loads during the wet season from diffuse sources

# Elizabeth River and estuary












Elizabeth River catchment showing subcatchments, features and monitoring sites.





## Elizabeth River and estuary












### Elizabeth River catchment **fresh ambient water quality**

Symbol	Indicator and units	Water quality objective	Current condition	Sample number for current condition	Compliance
	Electrical conductivity (µS/cm)	<200	25	30	✓
	Turbidity (NTU)	<20	4.3	30	✓
	pH	6.0 – 7.5	6.3 – 6.9	30	✓
	Dissolved oxygen (%)	50 – 100	69 – 92	12	✓
	Total suspended solids (mg/L)	<5	4	26	✓
	Chlorophyll a (µg/L)	<2	0.3	22	✓
	NOx (µg N/L)	<8	6	30	✓
	Ammonia (µg N/L)	NA	10	26	
	Total nitrogen (µg N/L)	<230	176	30	✓
	Total phosphorus (µg P/L)	<10	5	30	✓
	Filterable reactive phosphorus (µg P/L)	<5	1	30	✓

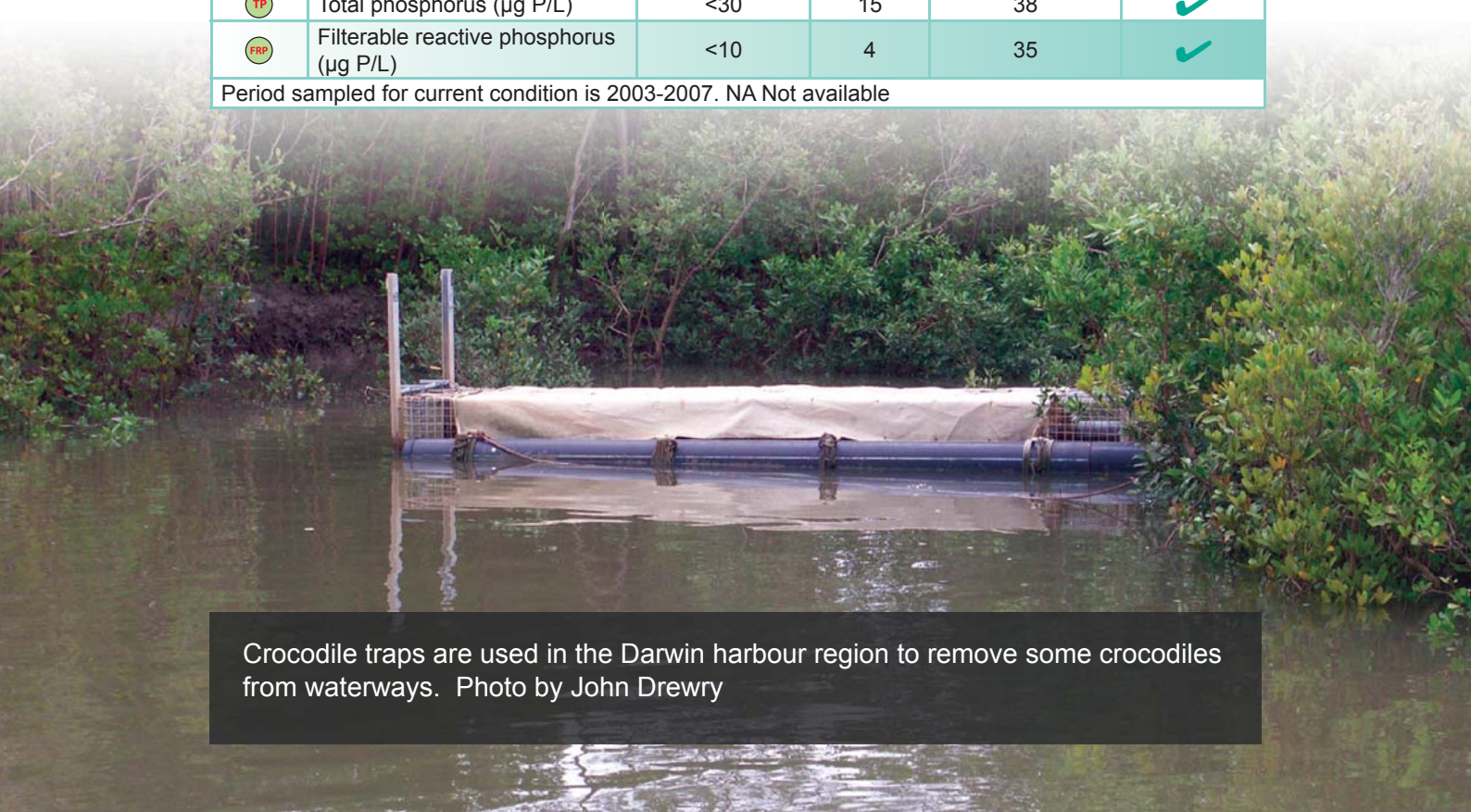
Period sampled for current condition is 2001-2005. NA Not available



### Elizabeth estuary **marine ambient water quality**

Symbol	Indicator and units	Water quality objective	Current condition	Sample number for current condition	Compliance
	Electrical conductivity (µS/cm)	NA	48000	140	
	Turbidity (NTU)	NA	3.7	11	
	pH	6-8.5	7.6-8.2	140	✓
	Dissolved oxygen (%)	80-100	70-81	11	✗
	Total suspended solids (mg/L)	<10	1	6	✓
	Chlorophyll a (µg/L)	<4	4.3	38	✗
	NOx (µg N/L)	<20	2	39	✓
	Ammonia (µg N/L)	<20	5	37	✓
	Total nitrogen (µg N/L)	<300	1270	20	✗
	Total phosphorus (µg P/L)	<30	15	38	✓
	Filterable reactive phosphorus (µg P/L)	<10	4	35	✓

Period sampled for current condition is 2003-2007. NA Not available



Crocodile traps are used in the Darwin harbour region to remove some crocodiles from waterways. Photo by John Drewry

## Elizabeth River and estuary

### Elizabeth River catchment loads and event-mean concentrations

Symbol	Indicator and units	Bennetts subcatchment current condition event-mean concentration	Elizabeth subcatchment current condition event-mean concentration
II	Total suspended solids (mg/L)	3.4	12.9
TN	Total nitrogen ( $\mu\text{g N/L}$ )	340	473
TP	Total phosphorus ( $\mu\text{g P/L}$ )	2.7	12.6
	Subcatchment area (ha)	932	10100
Wet season sampled for current condition is 2006-2007			
Symbol	Elizabeth River whole catchment load for an average wet season		
II	Total suspended solids load (tonnes/year)	3100	
TN	Total nitrogen (tonnes/year)	72	
TP	Total phosphorus (tonnes/year)	3.6	
	Total catchment area (ha)	22870	

### Biological health using the AUSRIVAS score

Site number	2001	2002	2003	2004	2005	2006	2007
DW44		A	X		B	A	
DW39	A	A	A		B	A	
DW40	A	B	A	B	B	A	B
DW26	A	B	A	B	B	B	B
DW52			B	A	B	C	
DW53			A	A	C	A	



Liquefied Natural Gas (LNG) is exported from Middle Arm. Further development of Middle Arm is planned through the proposed gas project joint venture between INPEX and Total. Photo by SkyScans