



5. Bongaree North to Bellara

5.1 Site description

The study area extends from Bribie Gardens Estate to the northern side of Bribie Island Bridge on the western coastline of Bribie Island over a section of approximately 1.3 km distance (refer to [Figure 27](#)). The land tenure along the foreshore in this section consists of esplanade/foreshore and road reserve under the trusteeship of Moreton Bay Regional Council.

The canal at the Bribie Gardens Estate features a rock groyne that protects the entrance to the canal on both sides (refer to [Photo Plate 5-1](#)). A sea wall extends from the northern side of the groyne to the bridge, which is largely exposed and has been further protected by rocks (refer to [Photo Plate 5-2](#) and [Photo Plate 5-3](#)). There is no sand build-up and no beach at low tide, apart from a small area of beach at low tide immediately south of the bridge (refer to [Photo Plate 5-4](#)). A large area of parkland and picnic facilities has been established behind the seawall north of the rock groyne.

North of the Bribie Island Bridge, the sea wall continues (refer to [Photo Plate 5-5](#) and [Photo Plate 5-6](#)) with some added protection in the form of rock placement up to four metres wide, large sand bags, and some timber groyne structures. The sea wall appears to be destabilised in the area of the boat hire company, where steps are located for access to the water (refer to [Photo Plate 5-7](#)). A grassy sand spit is located north of the timber groynes. There is a dense stand of coastal cypress behind the boat hire company site.

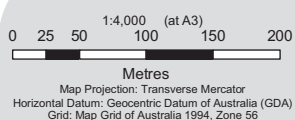
A footpath traverses the foreshore along this section.

A Coastal Management District over Land is mapped along the shoreline in this section (refer to [Appendix B](#)).



LEGEND

- | | | | | |
|-----------------|--------------------|------------------------|---------------------------------|-------------------|
| Stormwater Pipe | Cadastral Boundary | Section 86 Permits | Culvert/Bridge/Weir/Groyne/Wall | Dredging Area |
| Footpath | Community Facility | Jetty/Pier/Pontoon | Marina/Building | Beach Nourishment |
| Main Road | Foreshore Reserve | Boat Ramp/Works/Access | Channel/Canal | Seawall |



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**Bongaree North to Bellara -
Locality Plan**

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Figure 27

Photo Plate 5-1 Bribie Gardens Estate canal northern entrance



Source: GHD 21/12/2009 8:57

Photo Plate 5-2 Sea wall and park area north of canal



Source: GHD 21/12/2009 16:03

Photo Plate 5-3 Sea wall and rock protection south of bridge



Source: GHD 21/12/2009 14:15

Photo Plate 5-4 Bribie Island Bridge



Source: GHD 21/12/2009 14:17

Photo Plate 5-5 Sea wall and sandbags north of bridge



Source: GHD 21/12/2009 14: 30

Photo Plate 5-6 Infrastructure north of bridge



Source: GHD 21/12/2009 14:45

Photo Plate 5-7 Undermined sea wall and stairs north of bridge



Source: GHD 21/12/2009 15:00

5.2 Historical shoreline changes

The earliest aerial photography available for this area dates back to 1958. This image shows a narrow sandy beach fronted by a large intertidal flat, which was wide at the southern end and narrowed to nothing at the northern end of the beach compartment. The onshore migration of sand bars is evident from the meandering shoreline. The main navigable channel of Pumicestone Passage does not appear to have migrated since this photograph was taken.

By 1975, the shoreline was largely unaltered, and the movement of sand northwards in the form of migrating sand bars is still evident. However, between 1975 and 1982, a revetment wall was constructed along most of the shoreline, the exception being at the southern end in the vicinity of the creek that was to become the entrance to canal at Bribie Gardens Estate. The meandering alignment of the revetment indicates that it was probably constructed along an erosion scarp. There does not appear to be a recreational beach at high tide in the centre of the beach compartment.

Connection of the canal estate to Pumicestone Passage involved deepening and widening of the creek mouth, and stabilisation with rock breakwaters. Sediments removed as part of this construction work appears to have been placed immediately north of the northern breakwater. These sediments however were isolated from the active beach system by the completion of the revetment wall, which connected the revetment to the north with the northern breakwater.

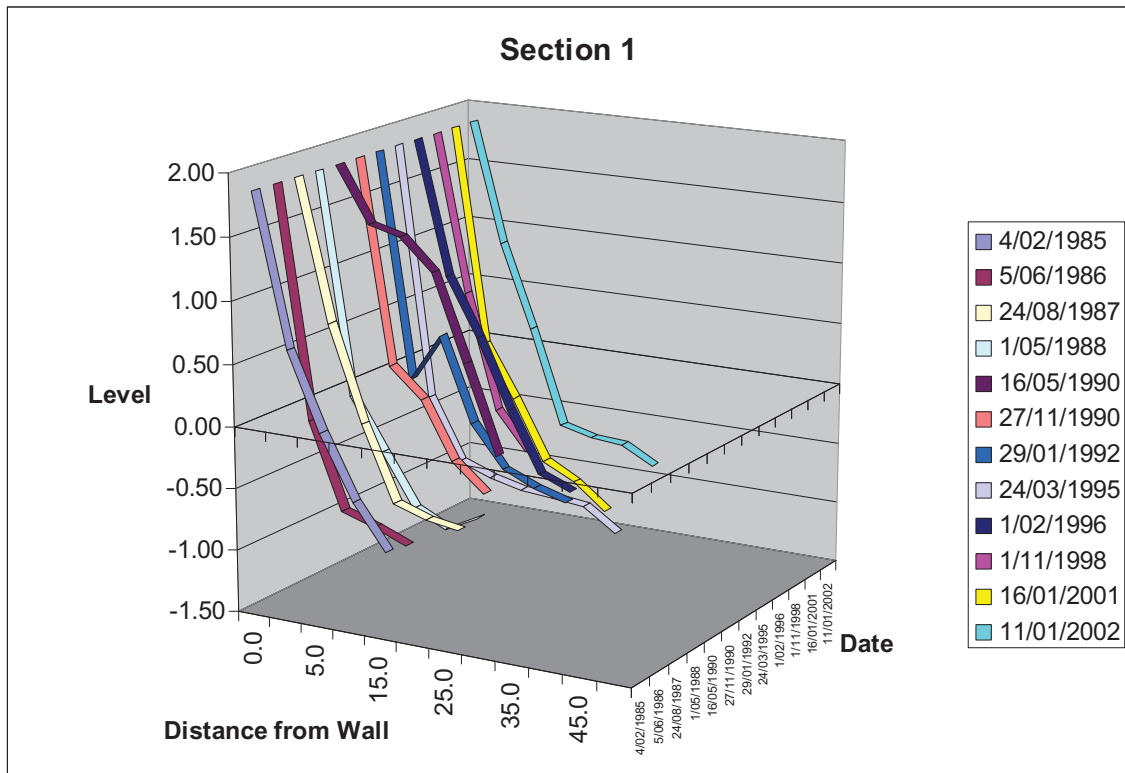
By 1990, a significant loss of recreational beach was apparent along the entire beach compartment at all stages of the tide. The supply of sediments to the beach appears to have been severed, resulting in beach lowering. The only recreational beach remaining was a small



beach just north of the canal mouth. Nourishment of this beach appears to have taken place by the 1999 photograph.

Aerial photography captured in 2009 shows no recreational beach at all along the entire beach compartment at high tide, indicating that further significant beach lowering has occurred. Details of the shoreline movement and the change in vegetation has been shown in [Figure 28](#) and [Figure 29](#).

Between 1985 and 2002, the Council carried out a monitoring program consisting of regular repetitive surveys of a number of fixed cross sections across the foreshore. A preliminary analysis of the data from one of these locations south of the Bribie Bridge opposite Ferguson Avenue has been undertaken and the results are presented in the following plot. The plot shows the variation of the foreshore shape with time. Note the temporary buildup of sand in May 1990 is probably associated with the movement of a “sand slug” progressing through the section from the south. Smaller “sand slugs” are evident in 1992 and 2002.

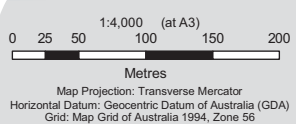


The northern end of this section north of the Bribie Island Bridge appears to be quite stable, with very little shoreline changes over the period of photography. By 1982 however, narrowing of the shoreline at the southern end of the beach adjacent to the Bribie Island Bridge was starting to appear. Progressive narrowing was again evident in 1990, but by 1999 the shoreline along the entire beach compartment had been fixed by the construction of a stepped revetment wall. In 2010 there is now no recreational beach until approximately 100m north of the bridge, and the toe of the revetment has been reinforced with rock armour and sandbags. Close to the southernmost end of the recreational beach, there is evidence of the recent construction of a small timber groyne.



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	Shorelines		1982		2003
			1990		2007
			1999		2009



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**Bongaree North to Bellara -
Shorelines**

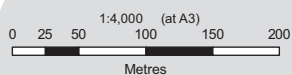
Figure 28



LEGEND

Vegetation Lines

- | | | | |
|---|------|---|------|
|  | 1982 |  | 2003 |
|  | 1958 |  | 1990 |
|  | 1975 |  | 1999 |
| | |  | 2007 |
| | |  | 2009 |



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**Bongaree North to Bellara -
Vegetation Lines**

Figure 29

G:\Projects\M1122291\CADD\GIS\Maps\SEMP_Bellara_Lines.mxd

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Data source: MBRC Quickbird Image 2009 and Council Infrastructure, 2009. Created by: S Potts

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5.3 Longshore transport

This section presents details of the potential longshore transport for this particular section of the coastline with both the annual southerly, northerly, and net transport movements shown as well as the seasonal variations. Just as the annual calculations are based on the average wind climate over the period of record for the full 12 months, the seasonal calculations are based on the average wind climate over the period of record for that particular season.

The seasons are defined as follows:

- ▶ Summer – December, January, February;
- ▶ Autumn – March, April, May;
- ▶ Winter – June, July, August; and
- ▶ Spring – September, October, November.

For this section of the coast the following observations can be made (refer [Figure 30](#)):

- ▶ The predominant transport direction is strongly to the north;
- ▶ The potential longshore transport has decreased slightly compared to the section to the south due to further sheltering from the south-easterly waves;
- ▶ the northerly transport at Bribie Bridge is slightly greater than the transport to the north and south due to the orientation of the coastline in this area;
- ▶ The seasonal variation is similar to the annual results with higher potential transport rates occurring during Autumn; and
- ▶ At Bellara virtually all the transport is to the north due to a combination of the coastline alignment, and wave refraction effects.

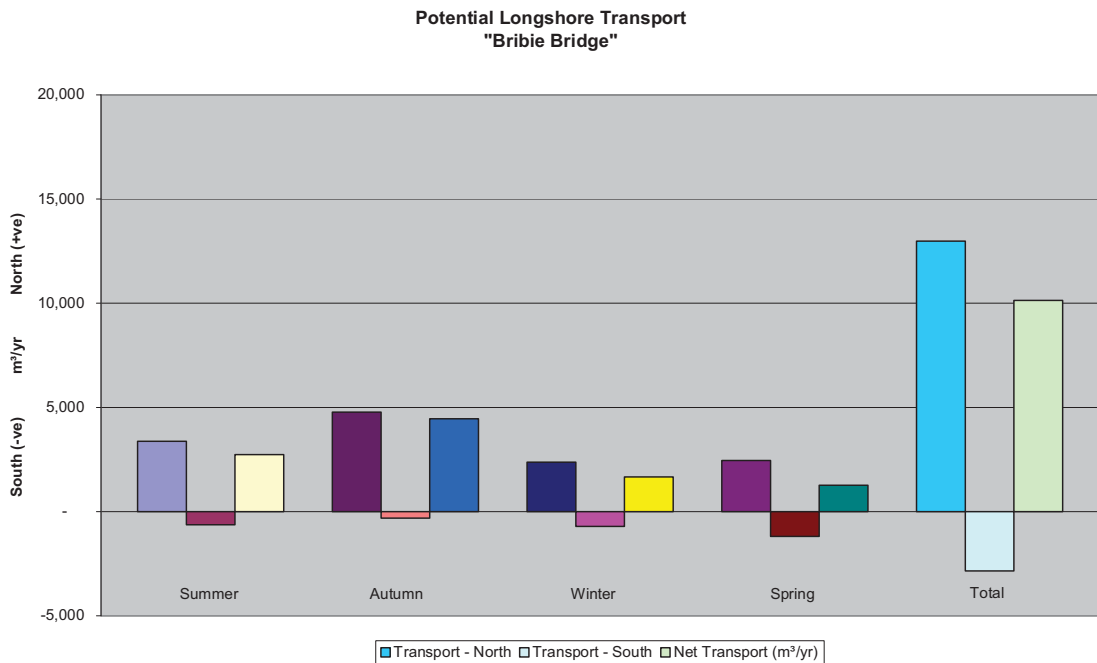
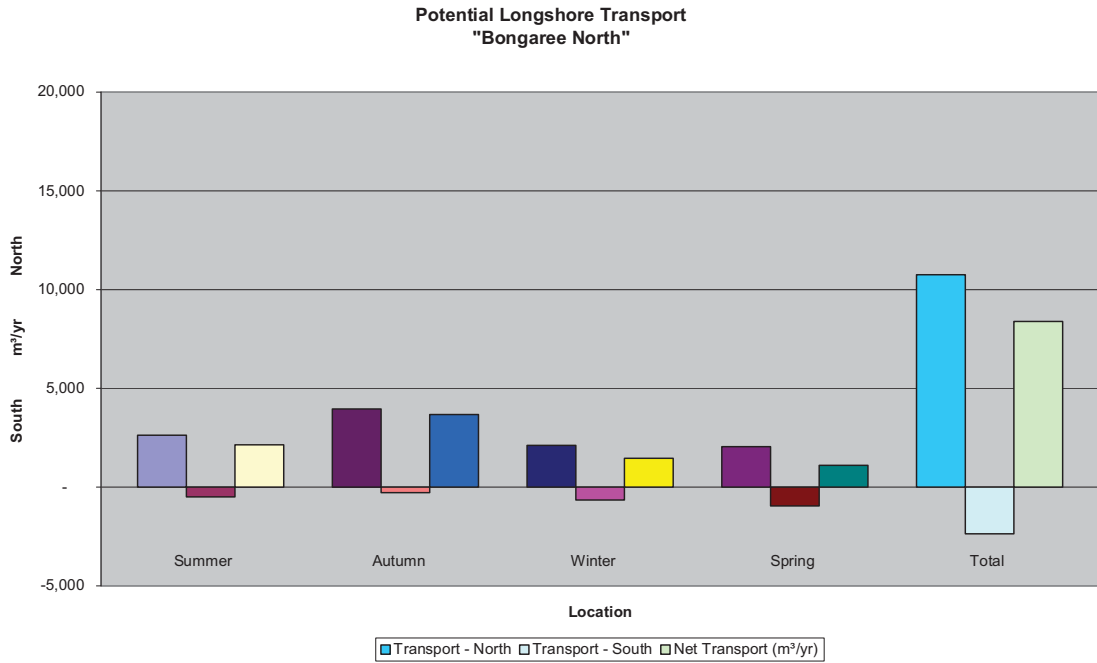
5.4 Expected shoreline trends

As there is no recreational beach along this section south of the Bribie Island Bridge at present, no further natural shoreline changes are expected under current sediment supply conditions. If sediment supply is to return, some re-establishment of recreational beaches may occur. The success of these beaches remaining will be dependent upon the quantity and reliability of sediment supply. Some human intervention such as carefully designed additional beach nourishment sourced from an inactive sand source may also be required as the significant beach lowering that has already occurred will inhibit natural sediment deposition.

Continued erosion north of the Bribie Island Bridge is expected to continue, resulting in further loss of existing recreational beach. Eventually this erosion would be expected to progress north to the boating infrastructure area.

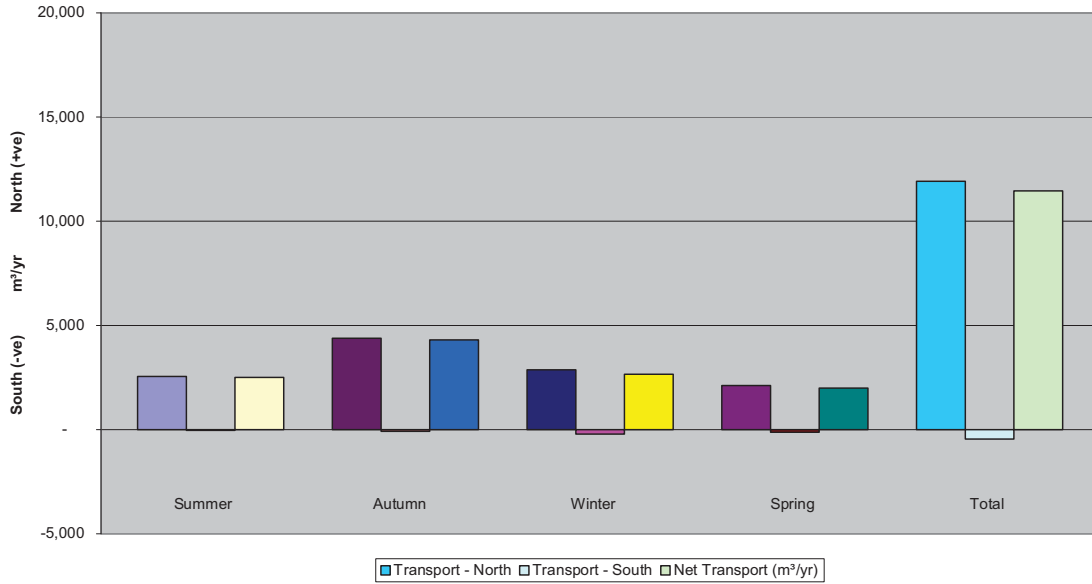


Figure 30 Bellara – Longshore Transport





Potential Longshore Transport
"Bellara"



5.5 Other considerations

Undermining of the existing revetment may also be an issue should further beach lowering occur. This would be influenced by the design and construction standard of individual sections of revetment.