



PORT of BRISBANE

Here for the future

2009 FPE Seawall Ecological Assessment

Presentation to CCC 29 July 2009

Background



- 4.6km FPE (Future Port Expansion) seawall completed in March 2005.
 - 1.25million m³ of rock.
 - Enclosed 230ha of sub-tidal habitat
 - Water depth 0.5m below LAT (River sections and bay side start) to approx 3.5m below LAT (on seaward side)
- FPE IAS (WBM 2000) predicted that seawall would develop into artificial reef habitat and fish aggregation site.
 - Previously dominated by muddy/sandy seabed with ephemeral seagrass
- Observed indicators of increasing ecological value (High use by vessel based recreational anglers, significant aquatic plant growth).



Ecological Assessment of the Seawall

Interest in measuring the colonisation of the built structure and establishing a baseline

- Opportunity to confirm predictions of IAS.
- Understand ecological values of our surrounding environment – baseline post-development
- Design influence and opportunities
 - Inform future seawall design and approval processes
 - International interest in best practice seawall design
 - Contribute to the broader understanding of the values of artificial reef habitats within Moreton Bay
 - Marine Parks artificial reef project partnership

Objectives of the Study

Part 1

- Describe the patterns in benthic flora and fauna colonisation on the seawall.
- Determine if the seawall flora and fauna varies at different depths and whether these differences were consistent along the length of the seawall.
- Determine if the seawall flora and fauna community is similar to natural reef communities in western Moreton Bay.
- Describe the habitat values provided by the seawall.

Part 2

- Parallel studies to look at sediment quality and chemistry



Study Methods

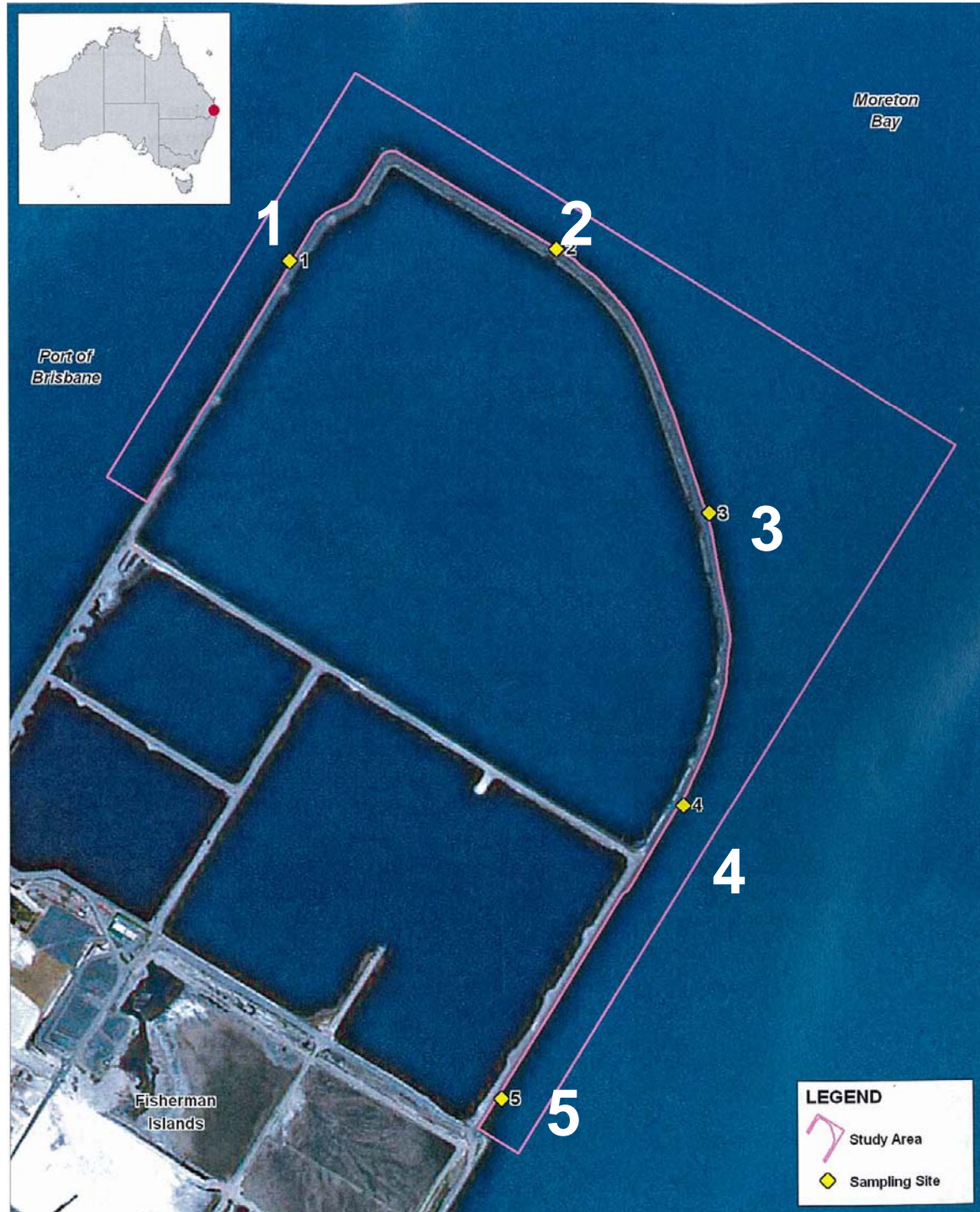
- Published and widely used reef sampling methodology (Harriott *et al.* 1995).
- Five locations around the seawall.
- Three depth strata (0.5m-1m, 1.1m-2m, >2m below LAT) at each site (if deep enough).
- Underwater video along three randomly placed transects within each depth strata (0.3m above substrate) within each site.
- Review of video footage using standardised methodology to identify species present, %cover etc.
- Range of statistical analysis applied to results.



Survey team member

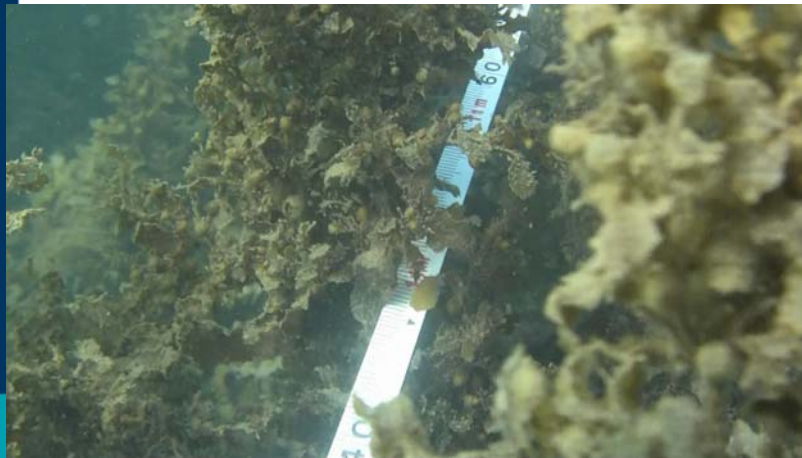


Cat shark



Results - Flora

- Dominated by macro algae species (16 algae species present), up to 100% cover along some transects.
- Brown algae dominant at all sites except site 5 (shallowest bayside site). Site 5 dominated by a green algae.
- Upper depth strata (to 2m below LAT) dominated by brown algae >2m more mixed algal community.



Dominant brown algae



Mixed algal community

Results Fauna

- Soft corals most abundant fauna group (approx. 1% total cover of the wall)
- Highest abundance of soft corals at sites 1, 4 and 5
- Hard corals present in isolated clumps (<0.2% total cover)
- Other fauna included sponges, sea squirts, sea urchins, worms, gastropods, bivalves and bryozoans.

Note. Sampling methodology was focused on attached fauna rather than mobile species (e.g. fish, sharks, crustaceans)



Soft Coral



Sponge

More Photographs



Urchin



Painted Crayfish



Soft Coral



Wobbegong

Conclusions

- Seawall supports a flourishing reef community with relatively abundant flora and fauna assemblages
 - Sites 1-4 generally similar (brown algae dominated)
 - Site 5 (green algae dominated).
 - Within sites community changed at depths >2m.
- Flora and fauna community similar natural reef environments in western Moreton Bay,
 - notable difference is that hard coral cover is less (1% seawall Vs 10% natural reef)
 - seawall cover may increase over time.
- Seawall is generally less complex
 - rocks of uniform size, vertical structure vs. horizontal
 - relative abundance of flora/fauna may always be different.
- After only four years FPE seawall likely to be providing locally important ecosystem functions.

Future Directions

- Communication of results within PBC and to relevant agencies and interest groups.
- Consider results in relation to future rock wall design (e.g. location of stormwater infrastructure/outlets).
- Repeat survey in 3-4 years to monitor change over time.
- Compliment this study with a further study to assess the value of the seawall from a recreational fishing perspective.
- Review Part 2 results once finalised



Red Algae



Filter feeding fan worms