



MIDWEST OVERVIEW

Luke Twomey
Oceanica



Midwest Region - Overview

Acknowledgements

- Mat Vanderklift (CSIRO)
- Karen Hillman (Oceanica)
- Oakajee Port and Rail

Luke Twomey

Oceanica Consulting



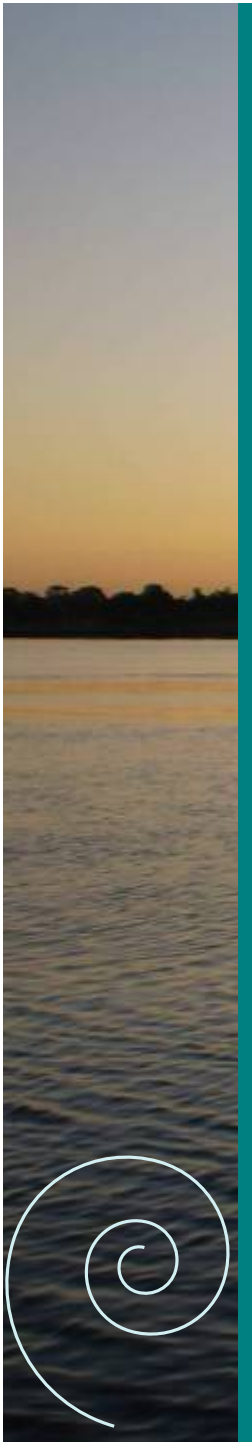
Midwest - Pressures

Past and Present

- Port operation
 - dredging, oil spills, introduced marine organisms and antifoulants
- Commercial Fishing
 - removal of target species and bycatch
- Recreation
 - marinas, boat harbours, boat ramps, beach use, rubbish, fishing
- Diffuse nutrients/Contaminants
 - agriculture, storm-water, flash river discharge

Future

- More Ships
- More People
- Mariculture
- Climate change
 - Sea-level changes, rainfall/runoff, temperature, storminess, acidification



Midwest - Major Recent Projects

- SRFME
 - CSIRO
 - Collaborative partners (UWA, Murdoch, ECU, Curtin, WA Museum)
- Food web model
 - CSIRO / Murdoch
- Deep water lobster
 - WA Fisheries / UWA
- Ecosystem monitoring
 - University of Tasmania / DEC



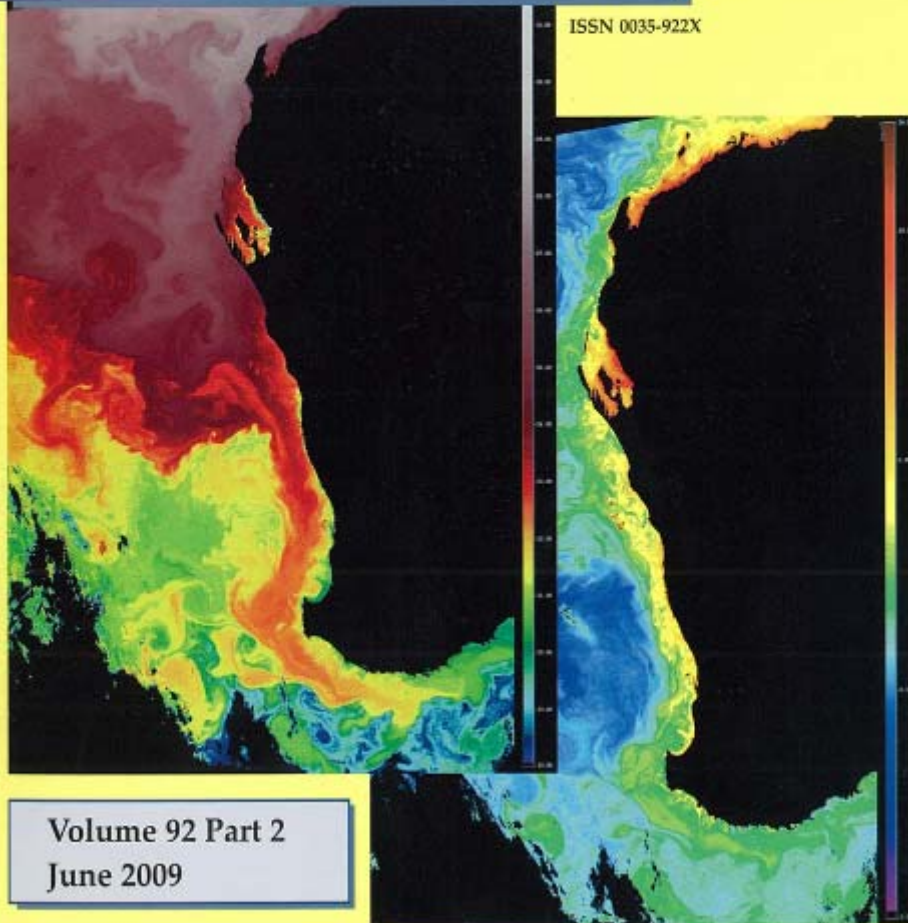
Leeuwin Current Symposium 2007

Proceedings of a Symposium held in September 2007
convened by A Pearce (Curtin University of Technology)



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- Several Midwest papers
- Large scale – oceanography
- Small scale – habitat and ecosystem dynamics
- Midwest characterised by convergence between tropical and temperate waters
- Phillips and Huisman – Marine Flora
- Watson & Harvey – Fish distribution

Midwest - Current Research

WAMSI Projects 2009-2010

Node 1

Project 1.2 Coastal ecosystem characterisation, benthic ecology, connectivity and client delivery modules (John Keesing)

Node 2

Project 2.2 Dynamics and impacts of the Leeuwin Current on the marine environment of WA (Ming Feng)

Node 3

Project 3.2 Biodiversity assessment, ecosystem impacts of human usage and management strategy evaluation (Russ Babcock)

Project 3.7 SRFME carryover projects – Jurien Bay (Chris Simpson)

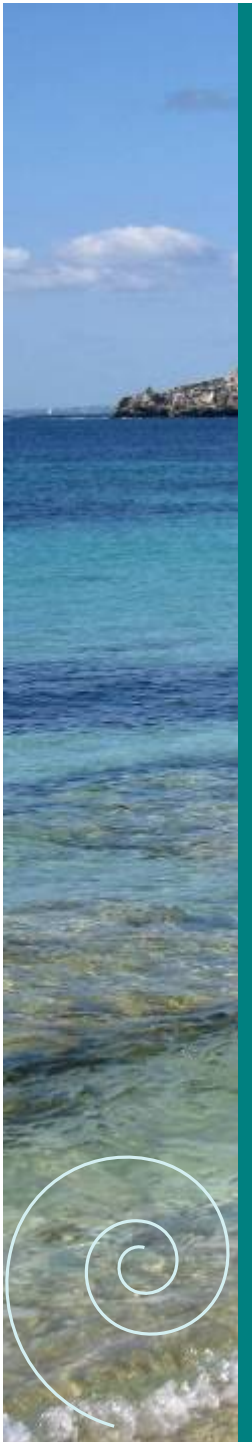
Node 4

Project 4.2 Assessment of community structure, biodiversity, habitat and climate change and the impact of anthropogenic influences (Euan Harvey)

Project 4.3 Trophic interactions and ecosystem modelling (Neil Loneragan)

Project 4.4 Captured species assessment (Steve Newman)

Project 4.5 Socio-economic implications (Malcolm Tull)





Midwest Current Research

(WAMSI research partners)

- Murdoch University
- Edith Cowan University
- University of Western Australia
- Curtin University of Technology
- Australian Institute of Marine Science
- Western Australian Museum

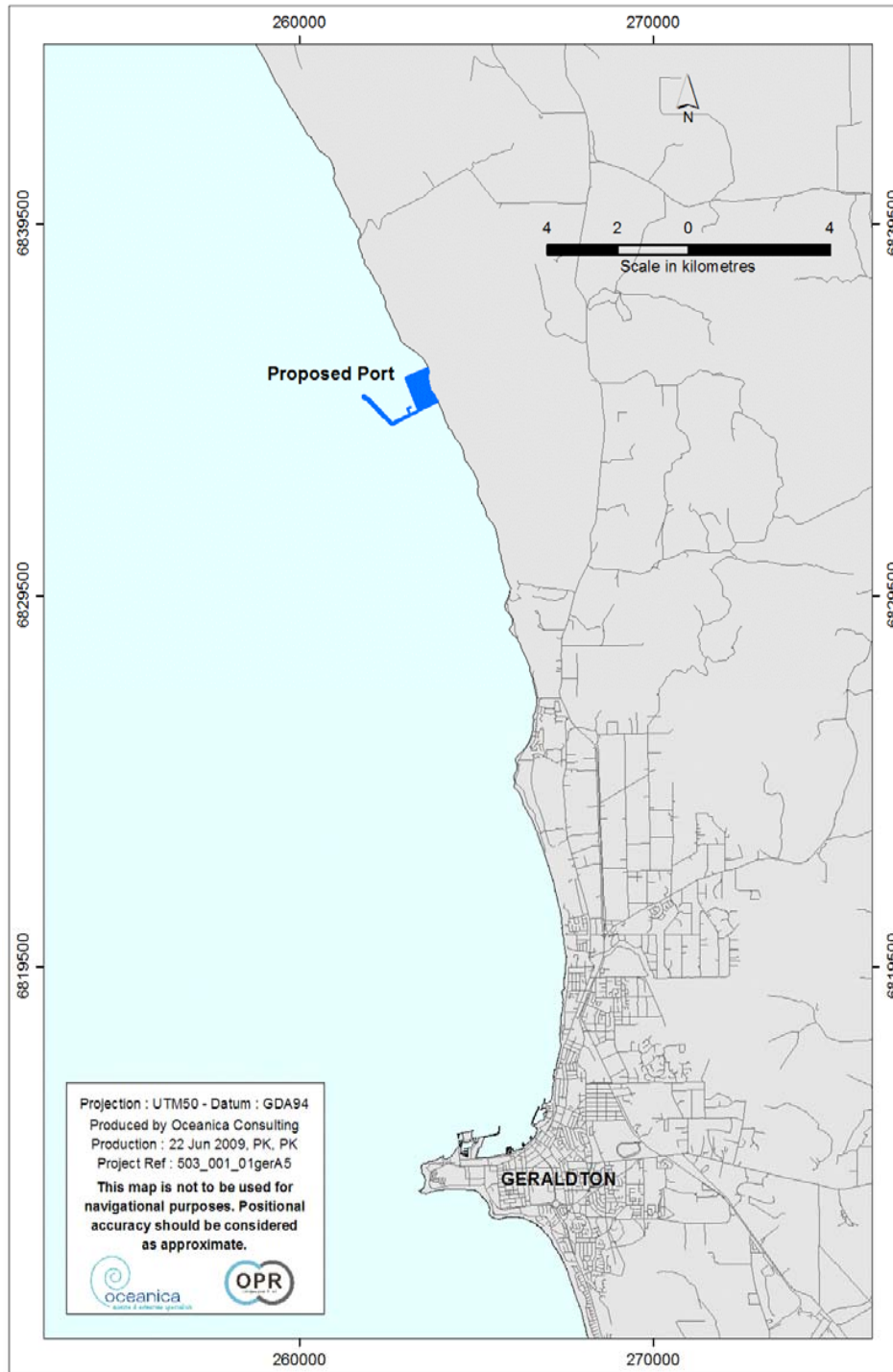
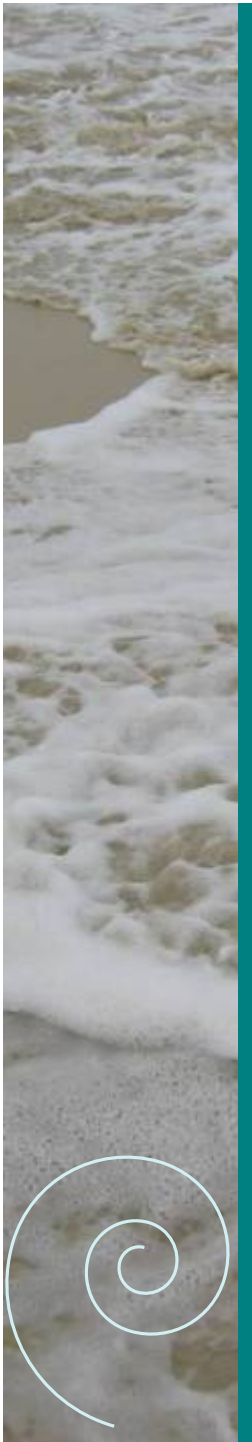
Mid-West Hot Topics

Richard Evans (Department of Fisheries)- Assessment of bycatch in the Gascoyne and west coast bioregions

Glenn Hyndes (ECU) – Tracing sources and fate of production using fatty acids in Jurien Bay.

Sira Tecchiato (Curtin) – Sediment mapping for identification of sediment sources, transport pathways and sinks for the inshore waters and coast between Greenough and Buller rivers (Geraldton)





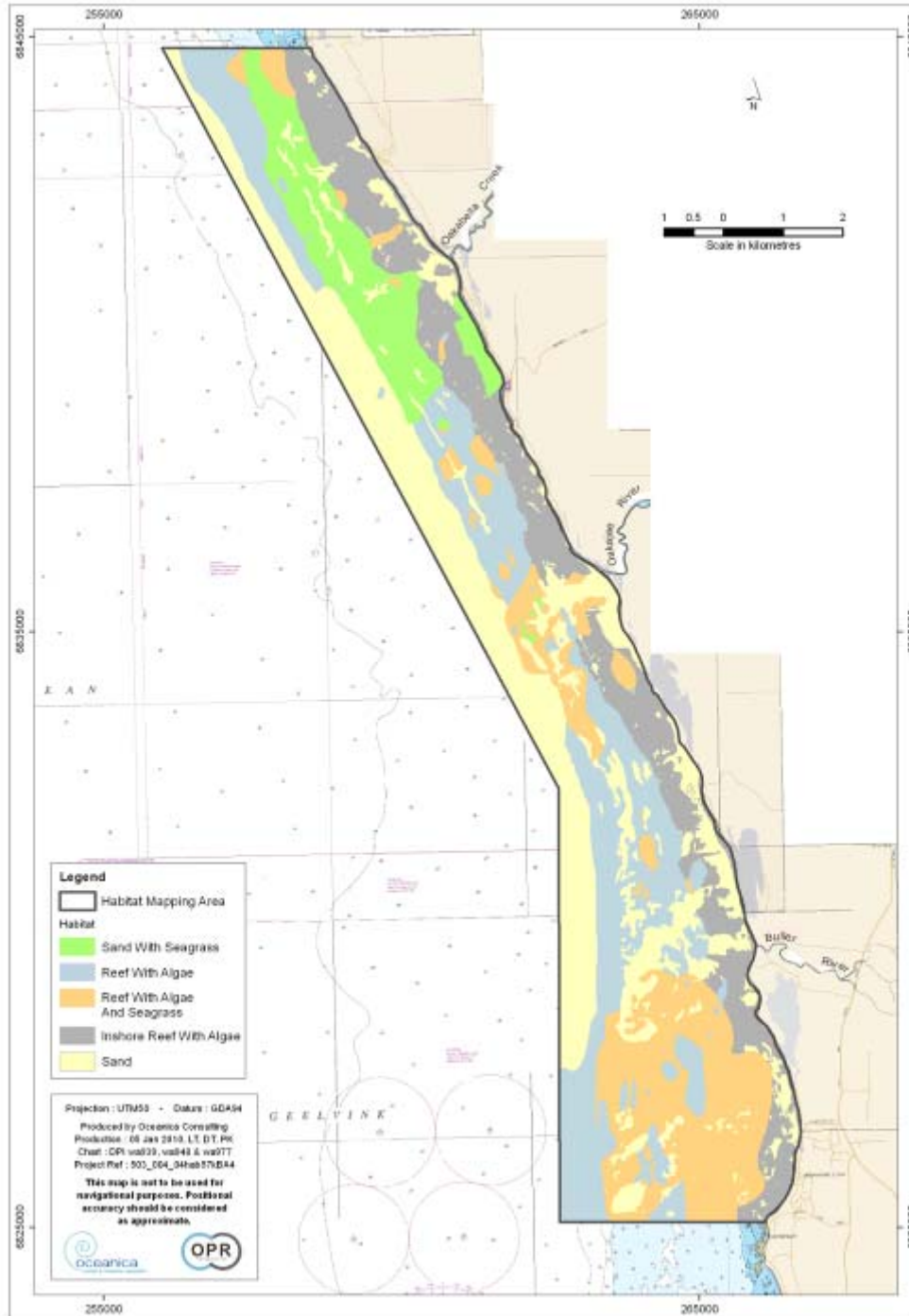
Oakajee Port

- Port, rail and industrial area
- Iron ore export
- Capes class vessels
- Work is being conducted for Environmental Impact Assessment
 - Baseline investigations
 - Construction monitor/manage
 - Operational monitor/manage

Oakajee Port Development

- Water Quality
- Sediment Quality
- Benthic Primary Producer Habitat
 - Mapping
 - Sub-lethal health measures
- Beach Cast Wrack
- Light and Turbidity
- Introduced Marine Species
- Coastal Processes (Shoreline stability)
- Hydrodynamic modelling
- Marine Mammals





1. Benthic habitat mapping

2. Seagrass and algal health characteristics

MBACI design

4 years of baseline data

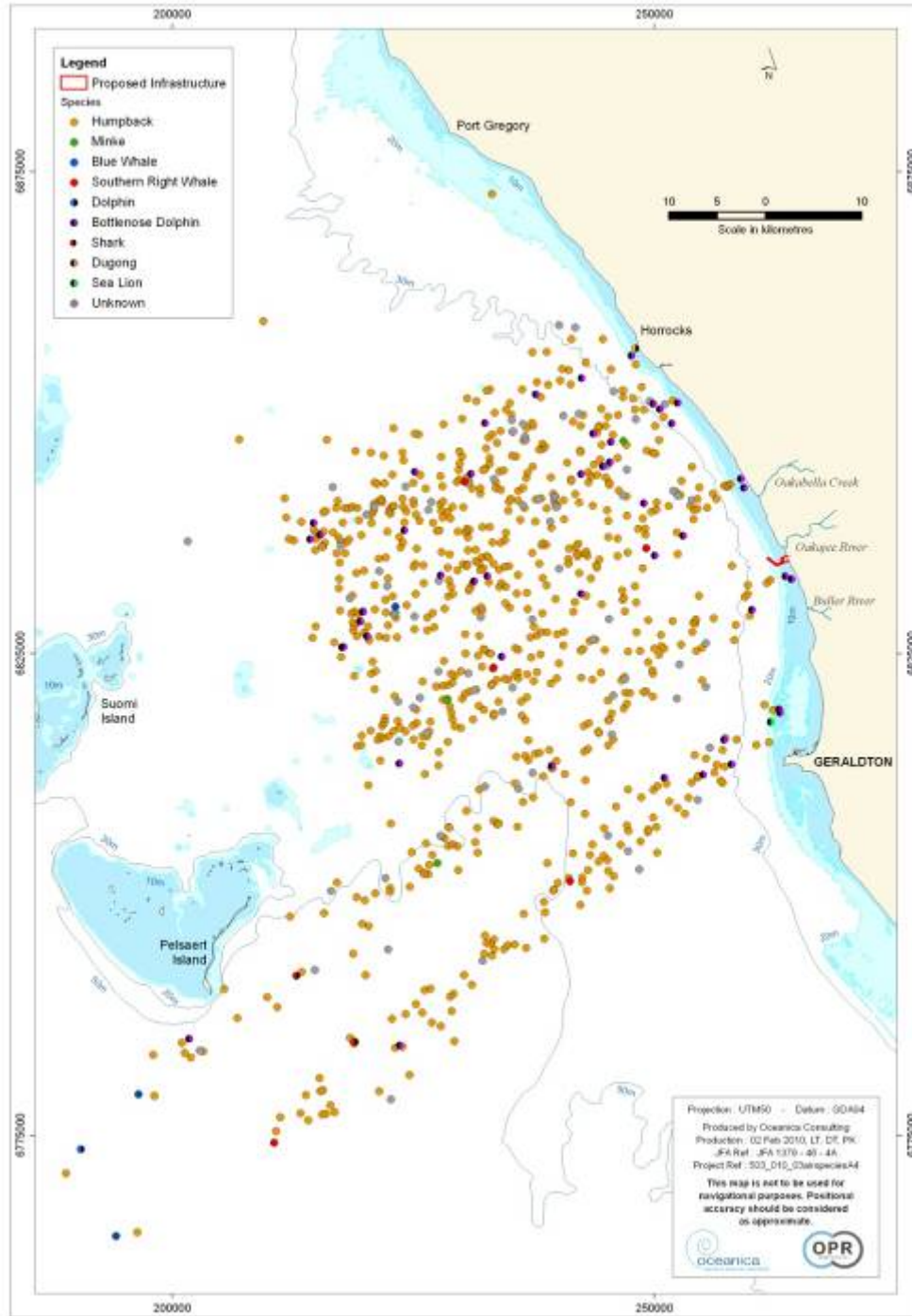
SEAGRASS

- Above-ground biomass;
- Shoot density;
- Shoot length;
- Number of leaves per cluster;
- Clusters per shoot; and
- Epiphyte load

ALGAE

- Density of three life history stages of *E. radiata* :
 - stage 1 (new recruit);
 - stage 2 (juvenile); and
 - stage 3 (adult).
- The height of adult plants (stage 3).





Marine Mammal Baseline Investigation

**Aerial Observations (n=32)
(Nov 2008 – Dec 2009)**

**Land based surveys (n=27)
Boat based surveys (n=30)**

Designed in consultation with:
Curt Jenner (Centre for Whale Res.)
Chris Burton (Western Whale Res.)



Conclusions

- Geraldton port expansion project – lessons learnt
- Oakajee outputs:
 - Expand knowledge of the region
 - Produce high quality scientific outputs
- WAMSI projects report next year
- Strategic thinking to manage midwest growth
 - People (urban development/changing land use, nutrient release, desalination, wastewater treatment/discharge)
 - Industry (associated with increasing development and iron ore export)