Management of dredging & spoil disposal projects in the Great Barrier Reef Marine Park associated with coral spawning

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Outline

- Dredging and the Marine Park
- Dredging, corals and spawning
- Recent and upcoming campaigns
- Management the way it was
- Management the way it is now
- Reducing risk, improving certainty
- Adaptive impact assessment and monitoring
- Case examples
- The future?

Dredging & the Great Barrier Reef Marine Park

- Dredging of Ports adjacent to the GBRMP began in the mid 1800's
- Dredging and spoil disposal is a recognised reasonable use of the Marine Park
- Recognised in the zoning process and the GBRMP Zoning Plan 2003
- Partnership approach between GBRMPA, Ports, Qld Government and DEH

Dredging, corals and spawning

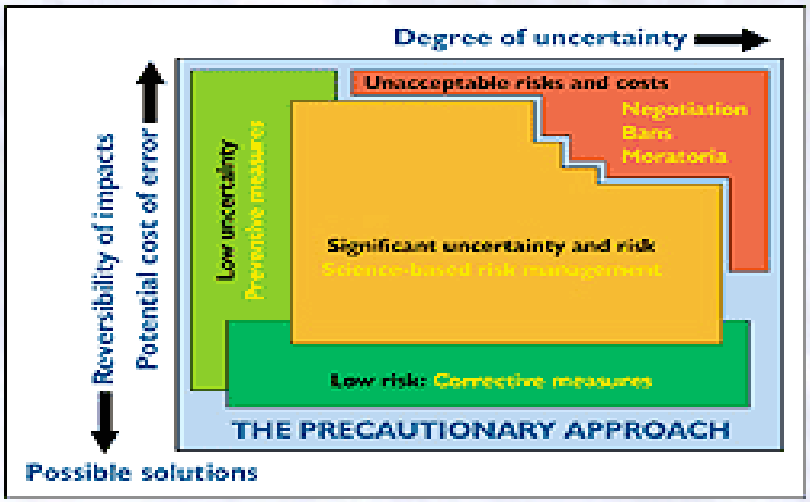
- Established acute and chronic impacts to coral from increases to turbidity and sedimentation values above local natural background values
- Near shore coral reef systems on the GBR coast tolerate naturally high turbidity and sedimentation rates (Larcombe *et al* 2002, Costen 1996)
- Thresholds (lethal) have recently been established for coral health (Nelly Bay, Hay Pont) – limited data on sub-lethal thresholds
- Effects are not restricted to just the spawning of corals

Dredging and the Great Barrier Reef Marine Park 2005/2006

- Rosslyn Bay Marina - 35,000 cubic metres
- Mackay Port Authority – 100,000 cubic metres
- HPCT – 138,000 cubic metres
- DBCT – 14,000,000 cubic metres
- Port of Abbot Point – 120,000 cubic metres
- Townsville Port Authority – 500,000 cubic metres
- Cairns Port Authority - 500,000 cubic metres
- Port Douglas Marina – 35,000 cubic metres

Management – the way it was

- EIS for small dredging and spoil disposal projects
- Short term permits - 1 year
- Intensive (repetitive) monitoring programs
- Very conservative permit conditions
- Application of the Precautionary Principal

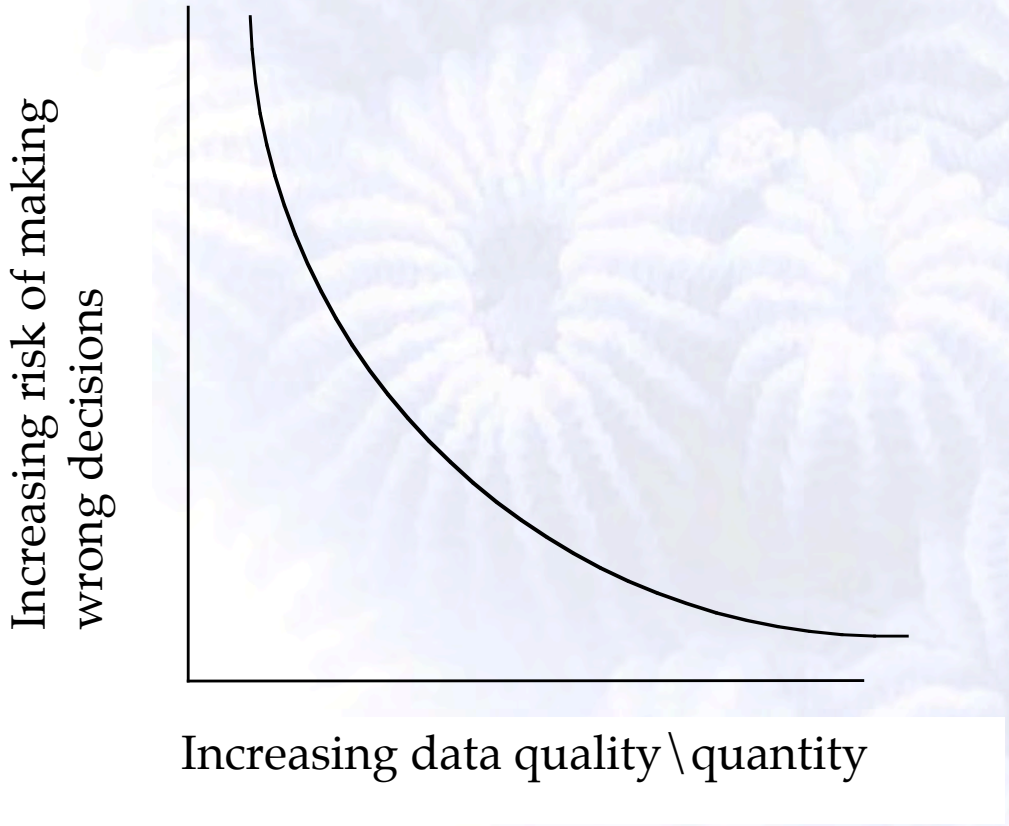


Management – the way it is now

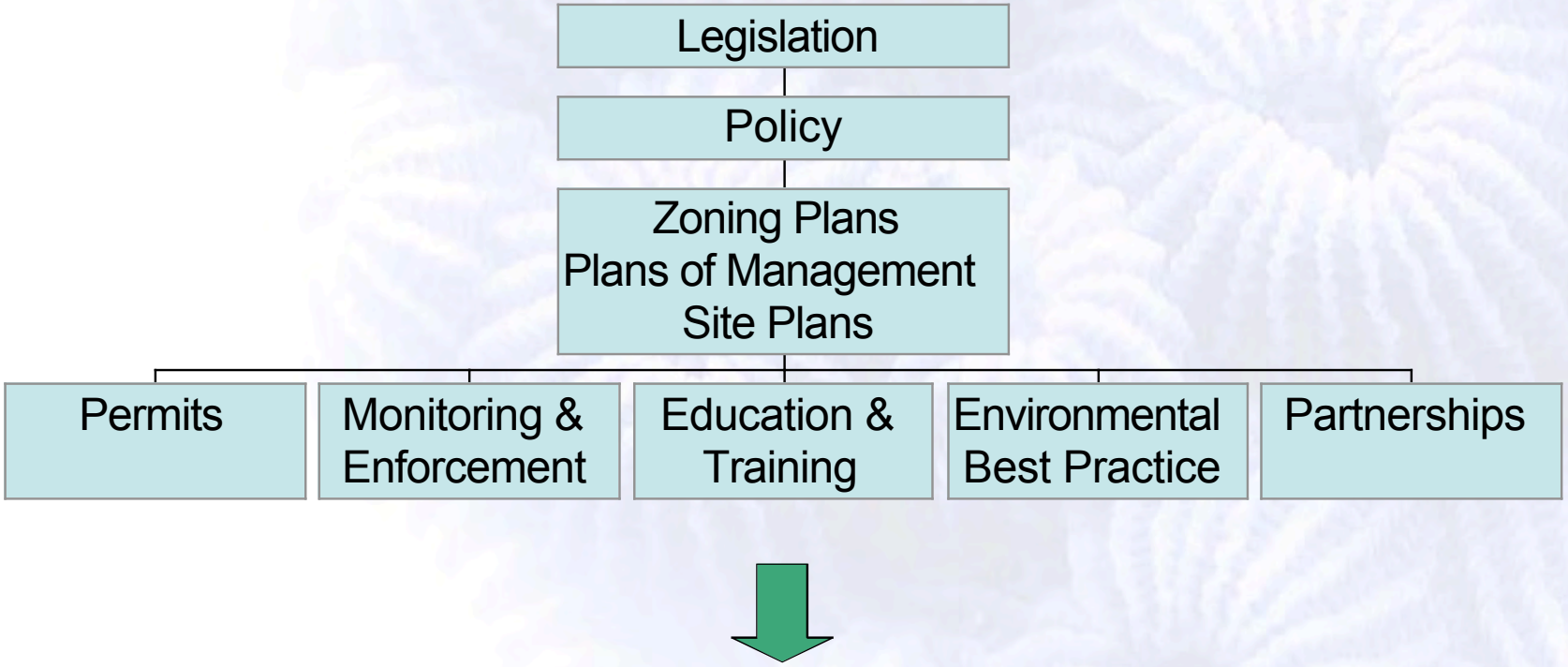
- Risk based approach
- Longer Term permits - 5 years
- Simpler Permits
- Approvals managed through EMP's and PMP's rather than legalistic permit conditions – more flexibility
- Partnership approach




Reducing risk in the decision making process

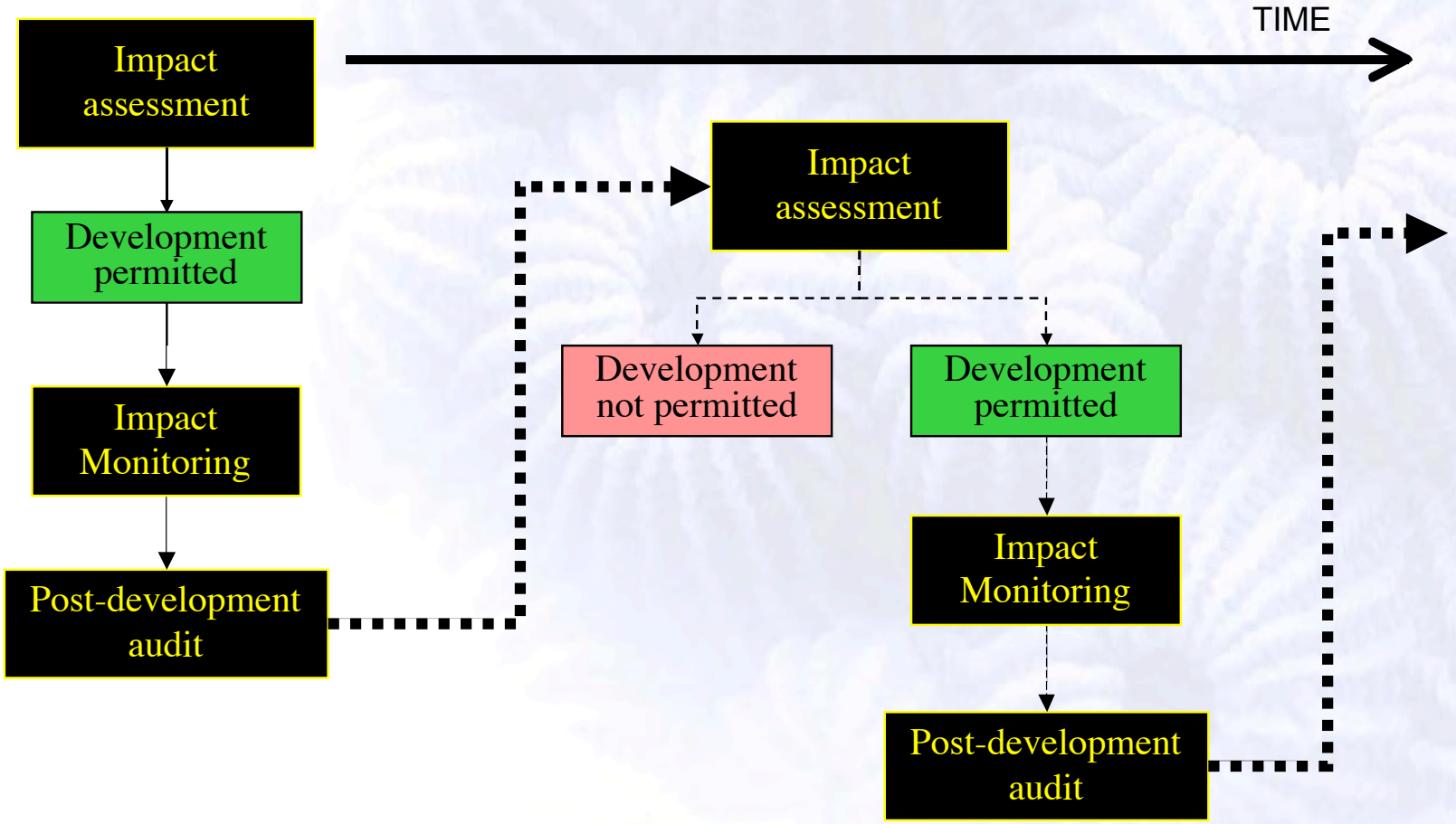


Management tools



Sustainability

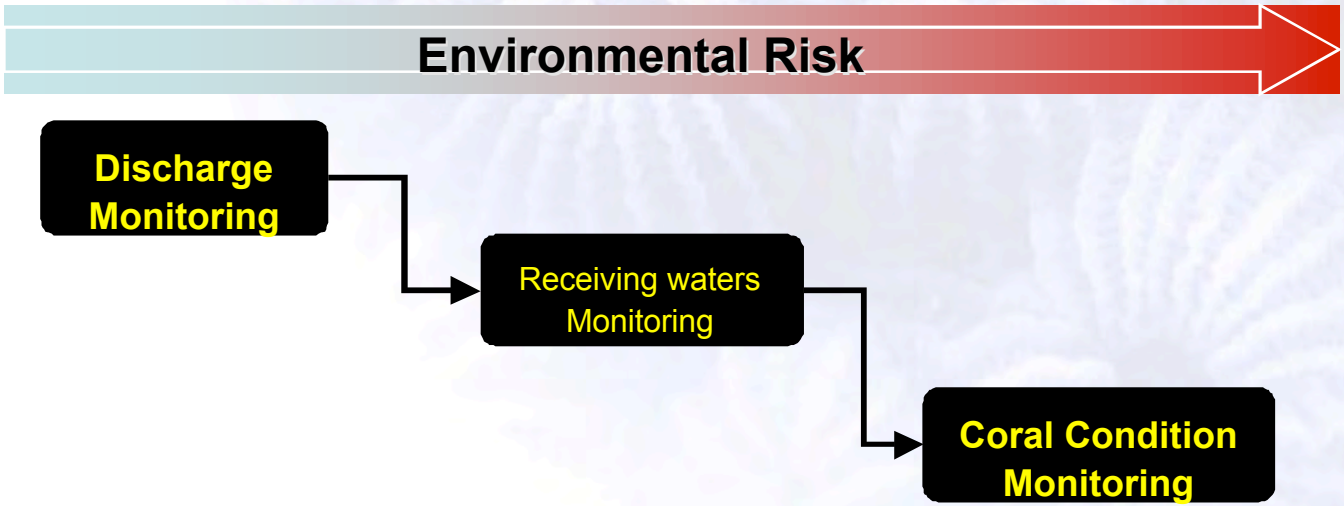
Adaptive impact assessment and monitoring



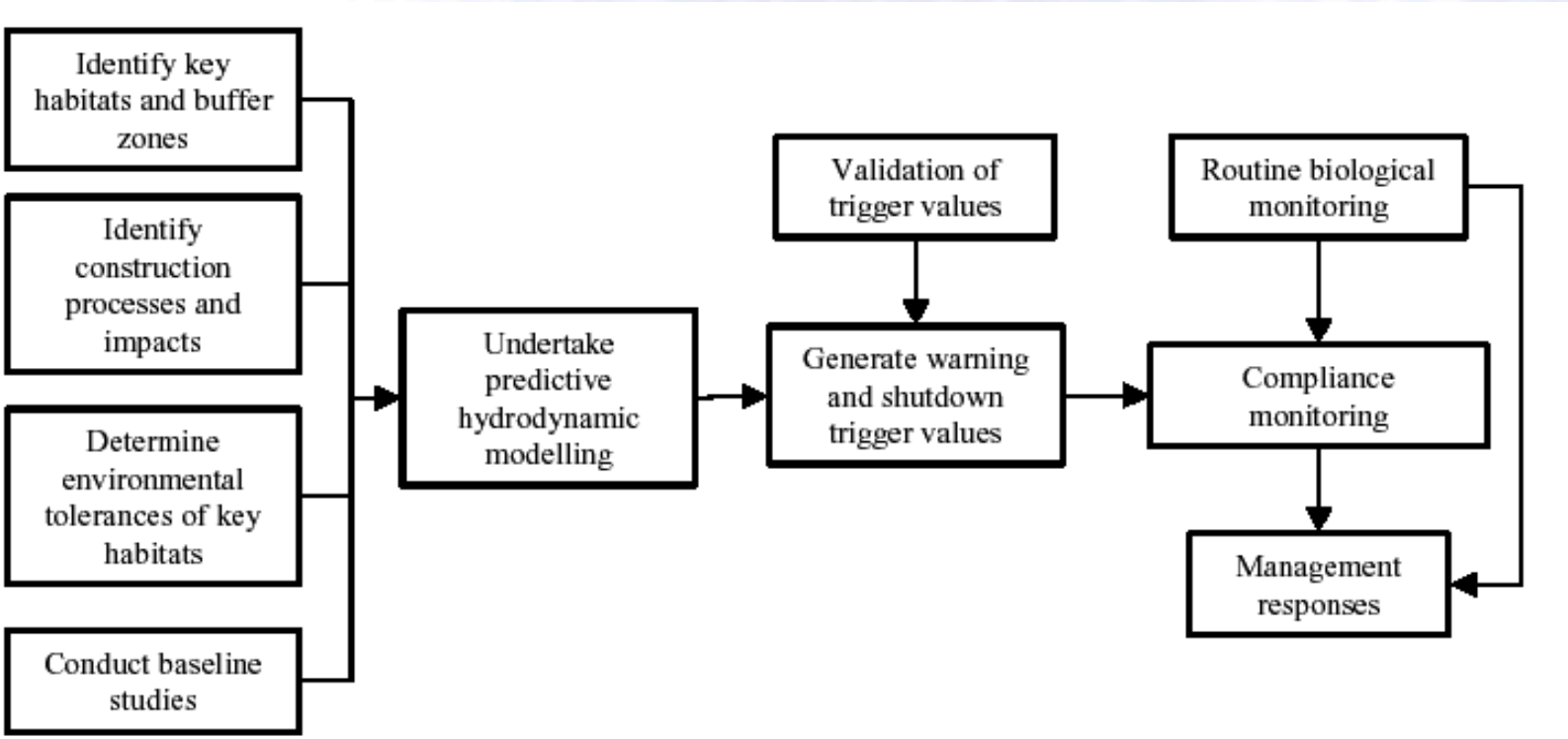
“Risk-responsive” monitoring programs

How to minimise risks while avoiding unnecessary monitoring?

- Modular design
- Intensity and design of monitoring program scales with level of environmental risk
- Built-in incentives for environmental performance

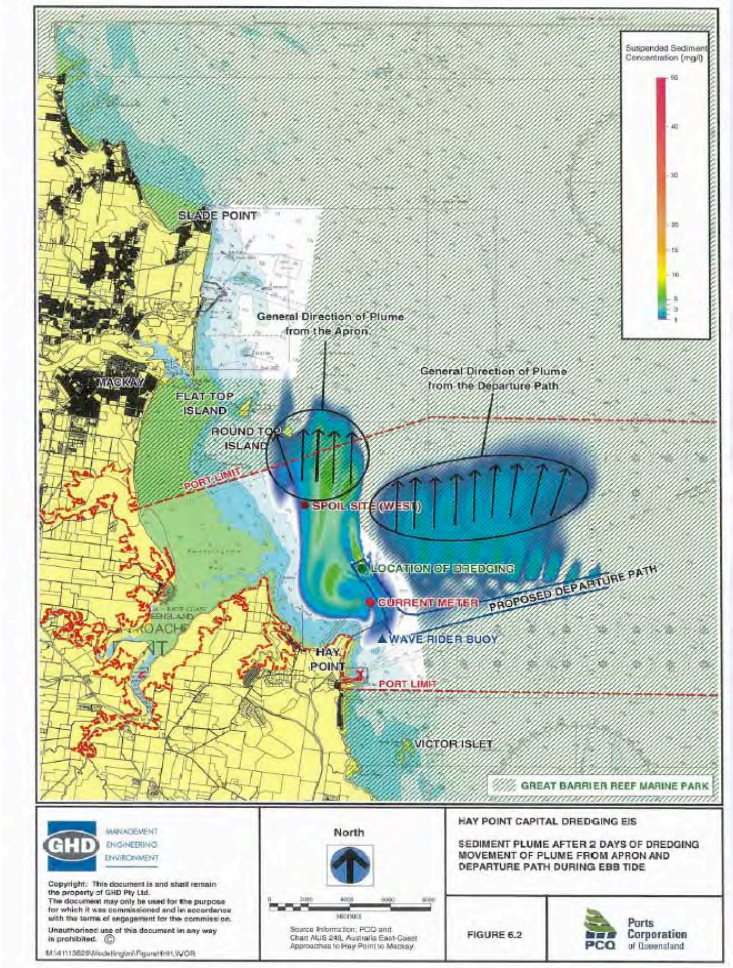


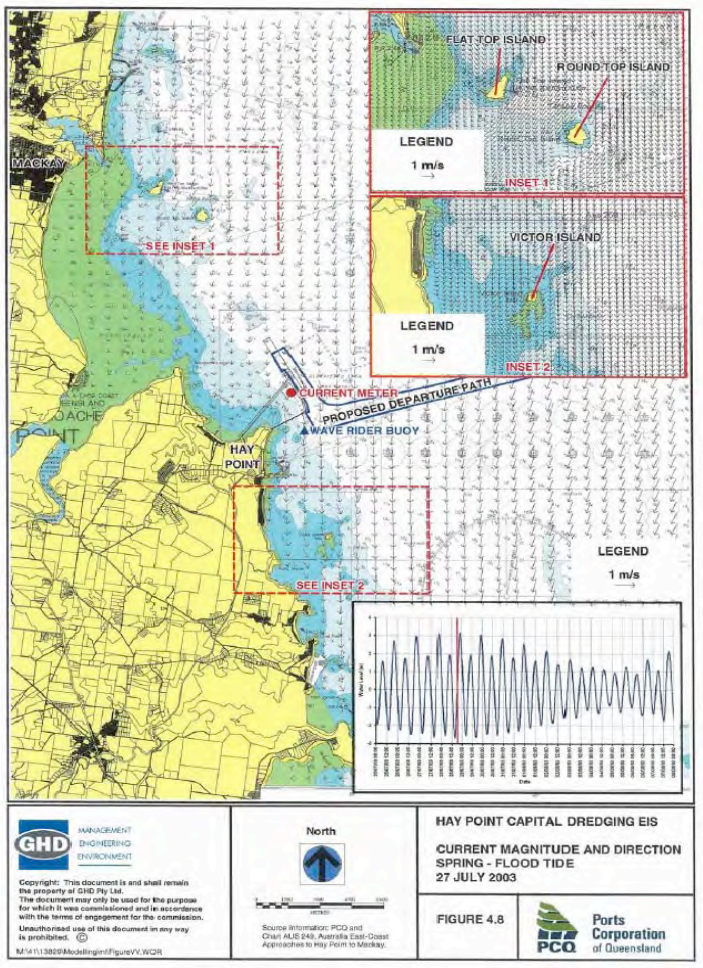
Port of Hay Point Predictive Monitoring Program



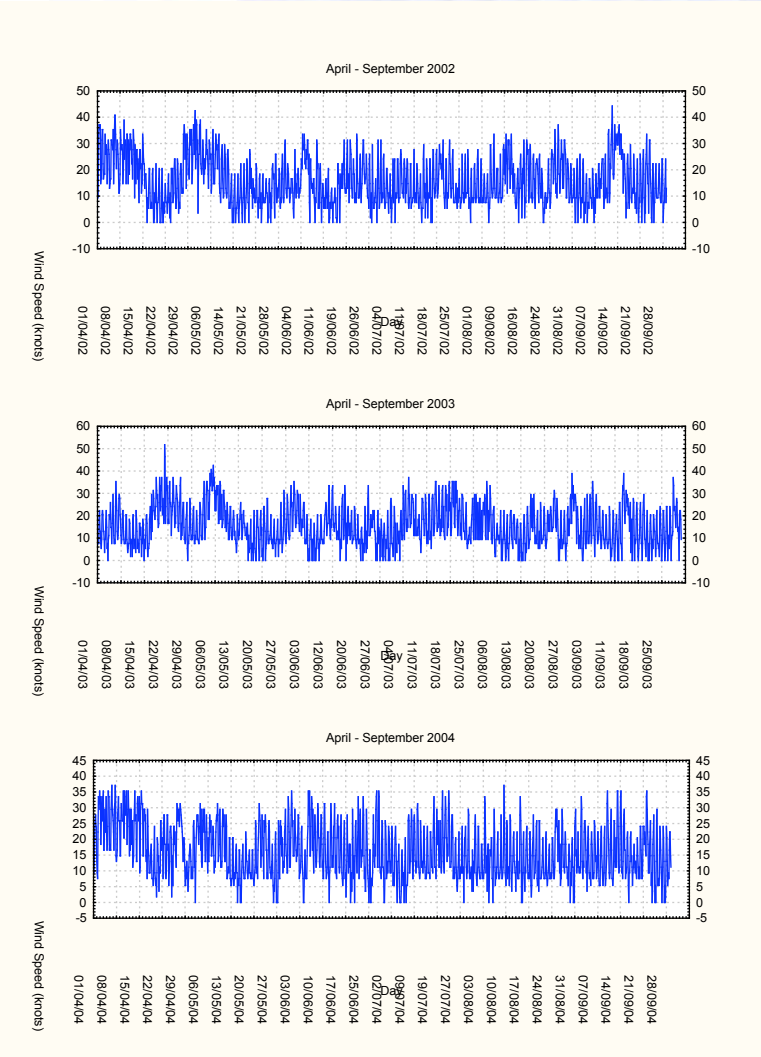
Identify Key habitats

Baseline physical data





Baseline physical data

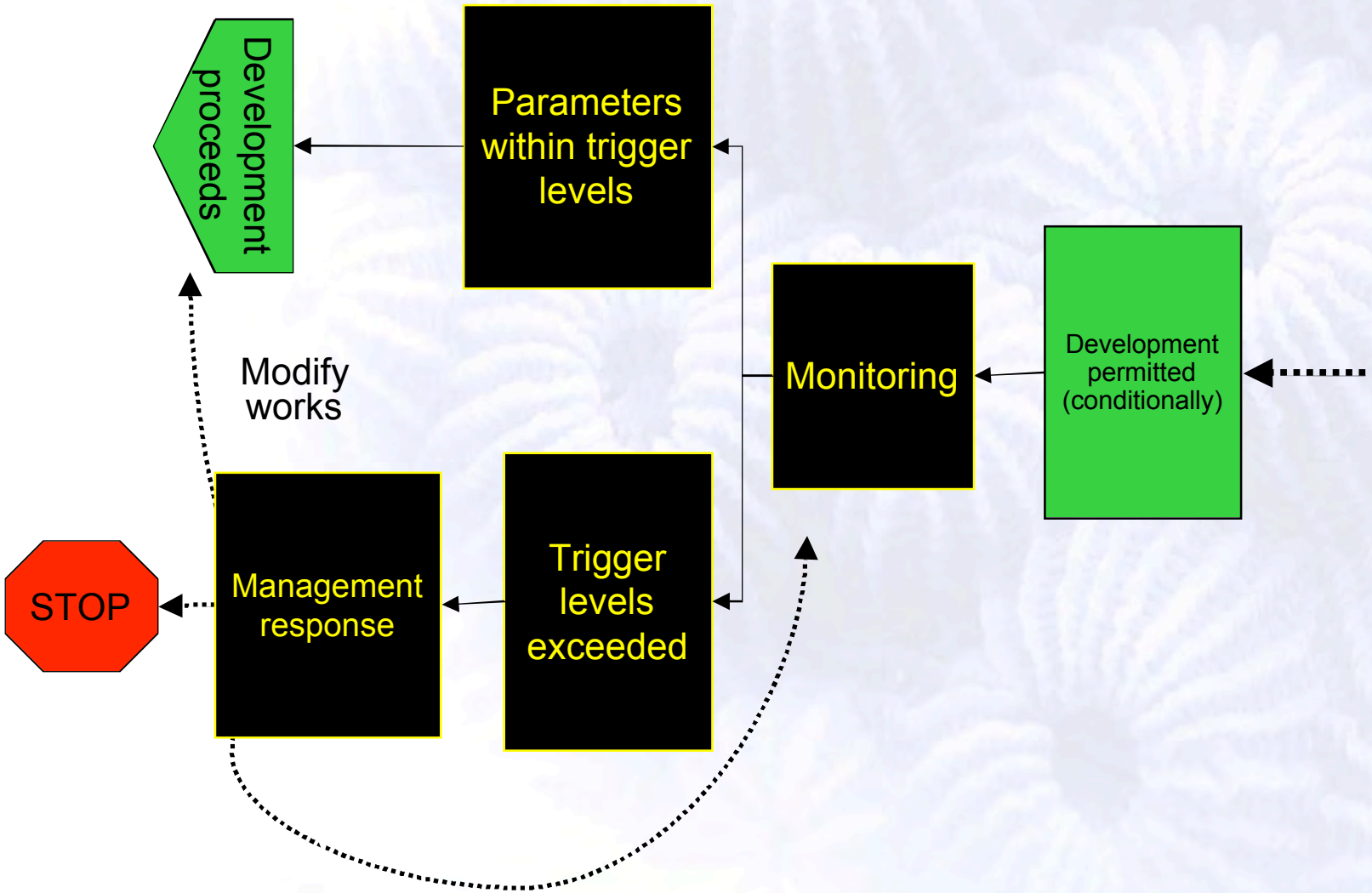


Development of turbidity tolerances

Turbidity tolerance for Round Top Island and Victor Islet, expressed in terms of intensity, duration and frequency

Spring Phase Turbidity Tolerance Values (ntu)	Neap Phase Turbidity Tolerance Values (ntu)	Duration
<20	<11 Round Top <18 Victor	Duration of tidal phase
20 to 60	11 to 60	6h followed by one tidal cycle exchange providing respite, in continuous repetition for 3 to 11 days.
>60	>60	2h

Predictive Impact Monitoring



“Real-time”management of PMPs

- Use of real time data loggers for turbidity, light and sedimentation
- Telemetry based equipment with live download capability via a web portal
- Observation of turbidity, light and sedimentation triggers in real time
- Intensive coral biology validation
  - Biological triggers

Benefits

- Predictive monitoring programs are a valuable tool for minimising risk
  - incorporate best available information
  - Decision support and “real-time” risk management
  - cautious progress under uncertainty
- PMPs can be adaptive
- “Risk-responsive” PMPs link monitoring costs to environmental performance

Management- recent case examples

Year	Location	Dredge volume	Management	Comment
2003/2004	Nelly Bay Magnetic Island	35,000 m^3	Reactive Monitoring Plan with Stop works	Coral Spawned as predicted
2004/2005	Dampier Port	Various	Reactive Monitoring Program	High mortality at SUPB partial mortality at other sites
2005	Darwin Harbour pipeline	Side cast	Reactive monitoring	Limited coral mortality
2005	Cairns Port	350,000 m^3	EMP	No impacts on coral or spawning
2006	Port of Hay Point	14, 000,000 m^3	PMP and EMP	Dredging window/Capacity to stop works

The future

- Better understanding of sub-lethal impacts (including spawning) of dredging and spoil disposal on corals needs to be developed
- Standardised quality of information provided by industry
- Better ability to mange cumulative impacts of multiple or ongoing dredging campaigns on these systems
- Improved knowledge base and transfer
- Working closely with other govt Departments and in partnership with stakeholders and industry

Question time

Question	Responses
Simpson- Who funds the costs of the dredging monitoring programs you have described?	Costen – It depends: mostly the proponent, but sometimes it's joint with GBRMPA. Programs can cost up to 1/3 of the total project cost in some cases. For some projects the proponent manages the consultant and for other GBRMPA direct the consultant. Appointment of consultant is either joint or done to GBRMPA specification.
Jernakoff – The timeframe of industry action is often much shorter than research delivery. Does GBRMPA use a risk assessment approach in setting management requirements?	Costen – Risk assessments based on the Australian Standard are used to identify relevant impacts requiring management in all EIS. GBRMAP bases much of this on legal requirements and the sensitive receptor approach.
Oliver – Your presentation provides estimates of turbidity tolerance thresholds. How are these set?	Costen – These are indicative based on the natural range of variation seen from data sets collected for typically 6 – 9 months prior to commencement of a project. Extreme events like cyclones are excluded from such baselines.
Masini – What sorts of durations of dredging campaigns have been involved where turbidity criteria have been set? Have your tolerance levels had to deal with non-natural sediments?	Costen – dredging campaigns have been of varying duration – one which was planned for a few weeks went for 9 months. We have had to manage both natural and artificial sediments – some sediments need to be placed onshore.
Westera – Does your management consider communities other than coral? Such as seagrass?	Costen – Yes, seagrass is an important community on the GBR and we have managed programs to protect it.
Smith – When monitoring corals, %cover may not be a very useful indicator of actual impacts.	Costen – Yes. GBRMPA request a variety of measures of coral health. For longer term impacts, programs are often required to monitor every 6 months for the following 5 years.
Stoddart- Have GBRMPA found the use of sub-lethal indicators practical?	Costen – These are more difficult to interpret. Their use is on a case-by-case basis depending on the project details.