An Information Guide for Strategic Management of Coral Reefs in a Changing Climate

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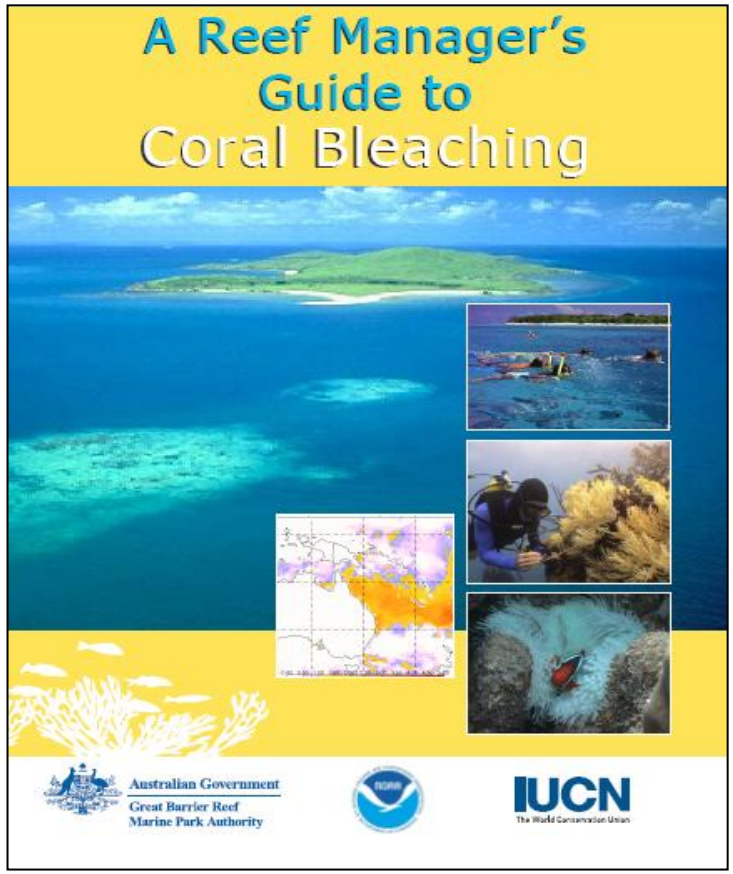
Manager's Guide



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The Value of Coral Reefs

Ecosystem Services:

- **Tourism**
- **Fishing**
- **Shoreline protection**
- **Natural products**

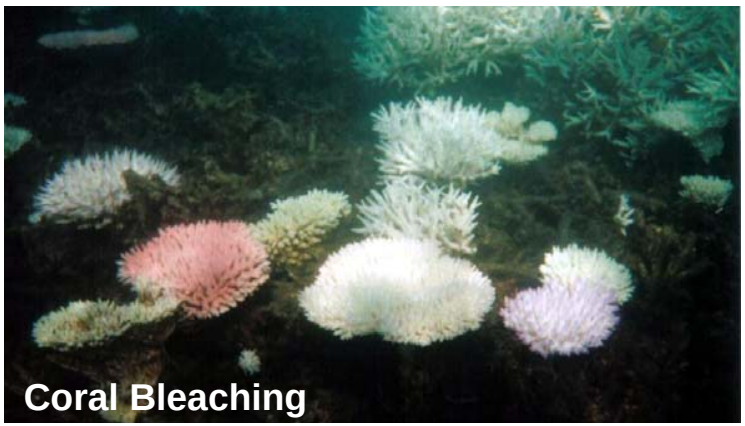
Ecosystem Functions:

- **Biodiversity**
- **Trophic complexity**
- **Primary productivity**

Threats to Coral Reefs

- Pollution
- Sedimentation
- Unsustainable fishing
- Habitat destruction
- Disease
- Coral bleaching

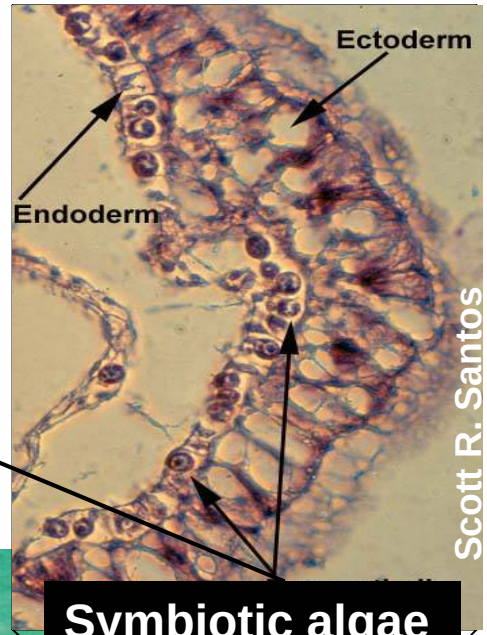

Sediment Plumes

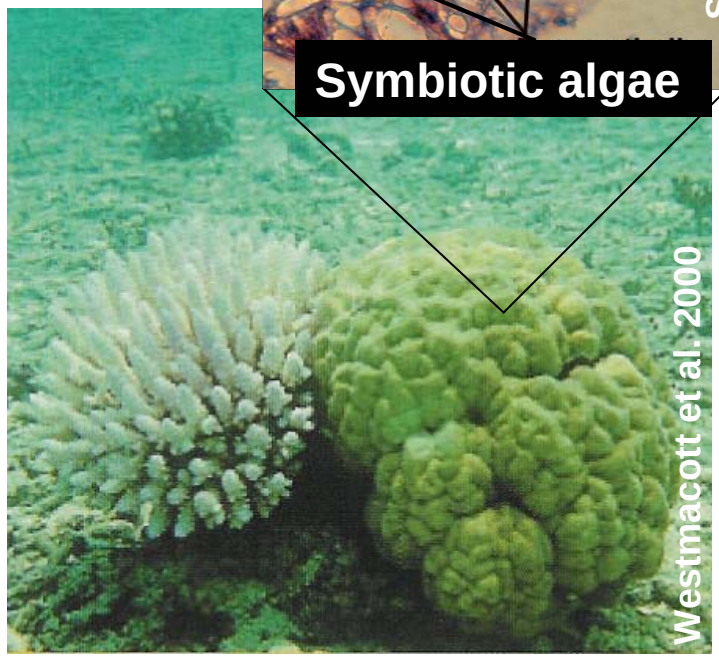

Coral Bleaching


Black Band Disease

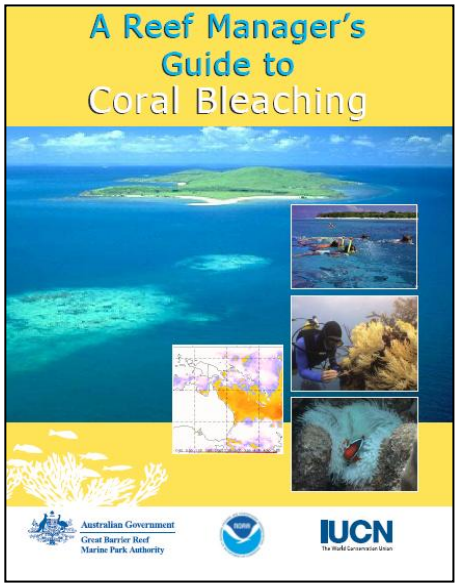
What is Mass Bleaching?

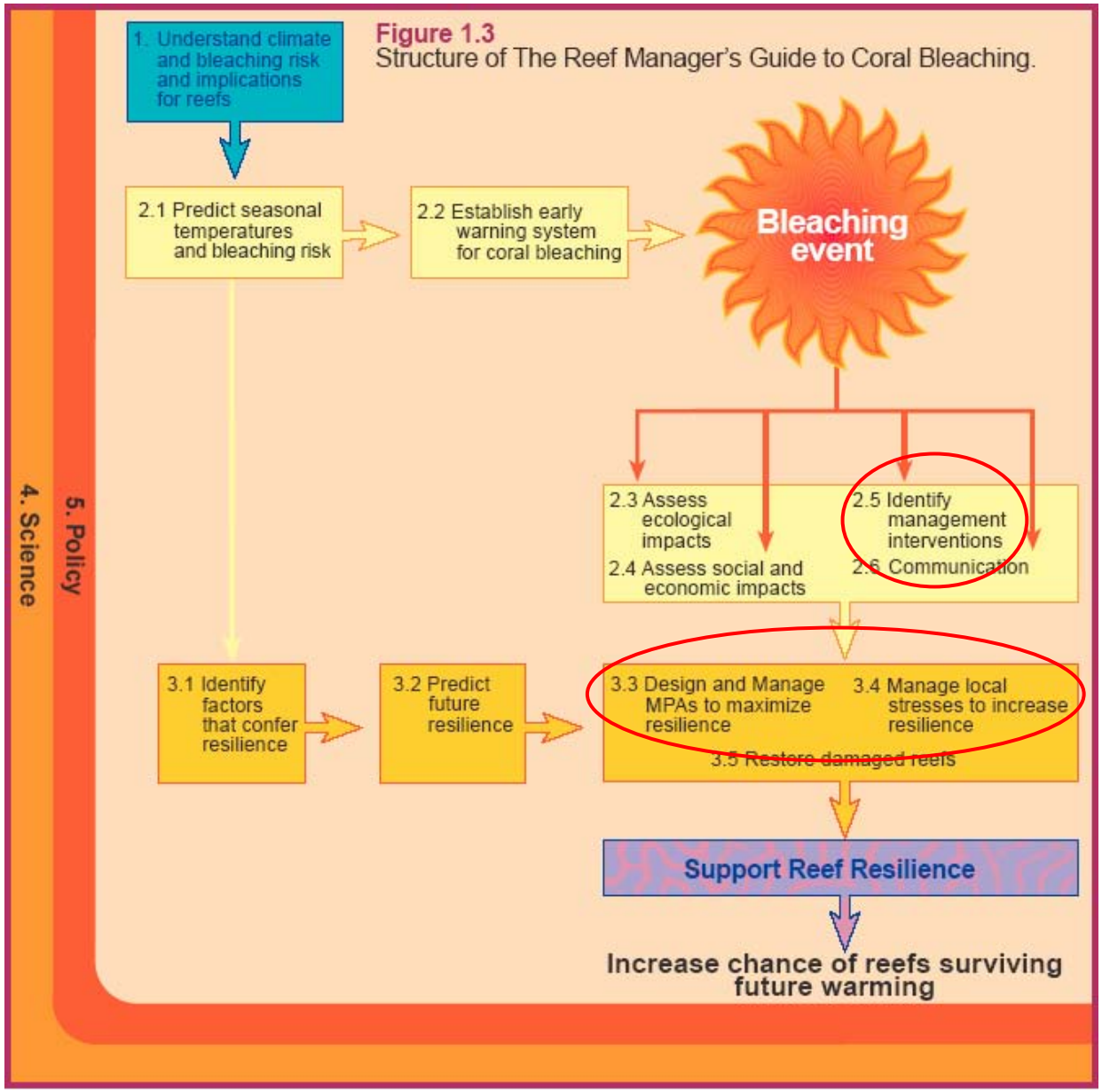
- Coral is exposed to high temperatures and/or high UV radiation, often during ENSOs
- Coral/algal symbiosis is disrupted
- Algae are lost from coral host, coral appears “bleached”
- Bleaching occurs over large spatial scales
- Corals/coral reef either recovers, or suffers mortality



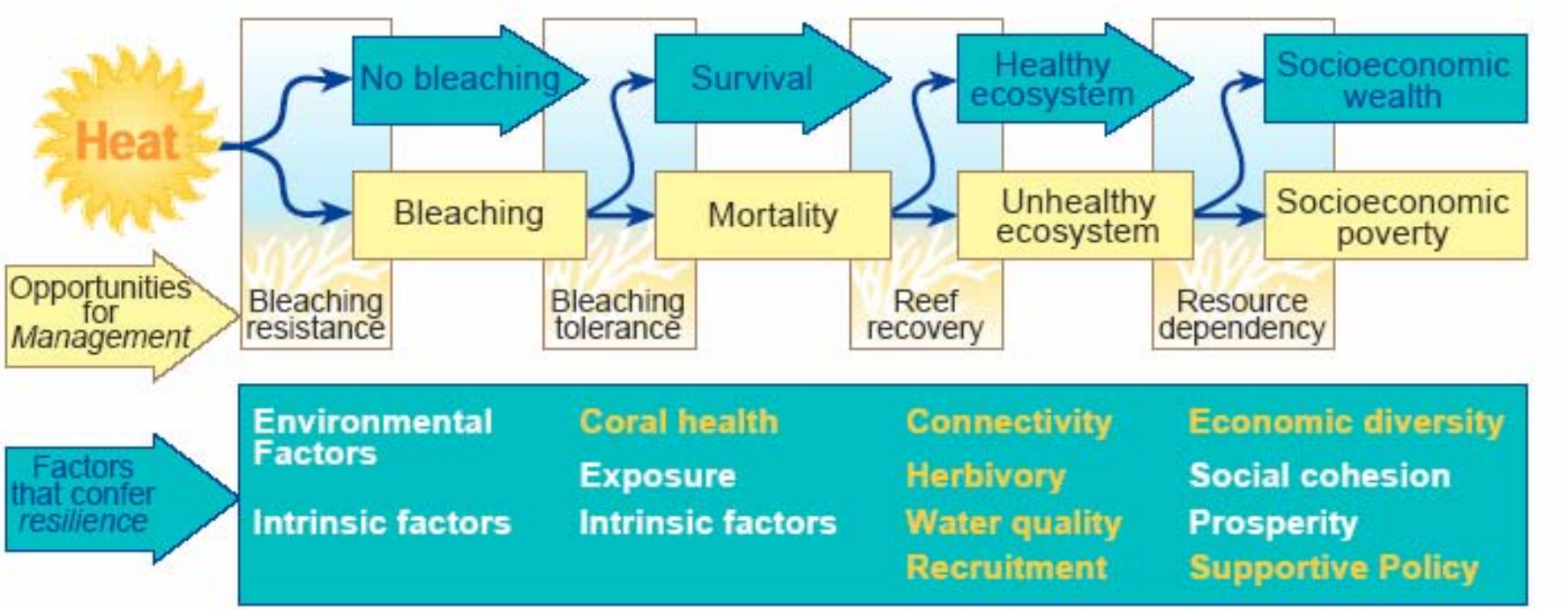


Guide Structure





Opportunities for Coral Bleaching Management



- **Immediate-term: Support resilience by reducing local stressors**
- **Longer-term: Use info on natural resilience for planning**

Immediate-Term Management Interventions

Manage Local Stressors

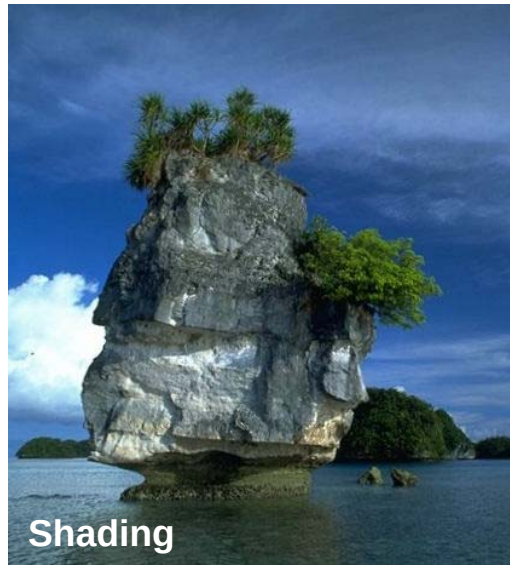
- **Fishing**
- **Recreational use**
- **Water quality**

Longer-Term Planning for Resilience

Resilient reefs are likely to have one or more of the following:

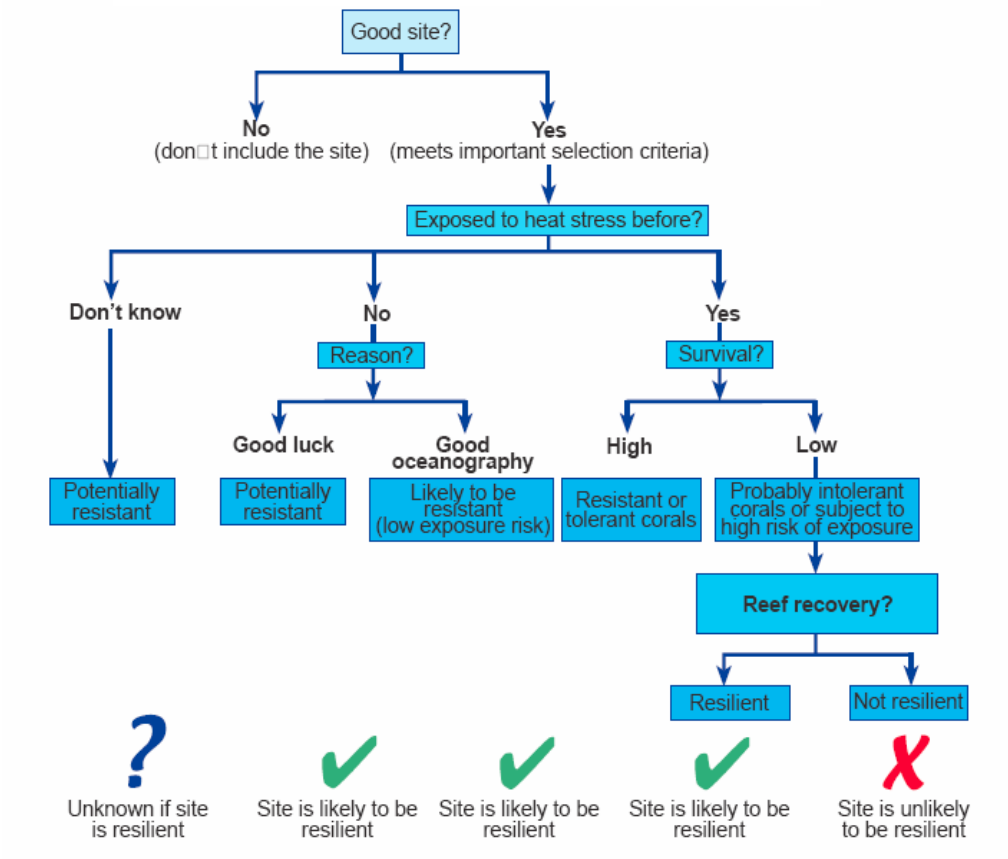
- **Cooler water due to upwelling/mixing**
- **Rapid currents that flush toxins**
- **Shading of UV by cliffs/shelves**
- **Turbid waters that screen UV**
- **Communities that have adapted or acclimated to past fluctuations in temperature/UV**
- **Conditions that are conducive to coral recolonization**


Currents

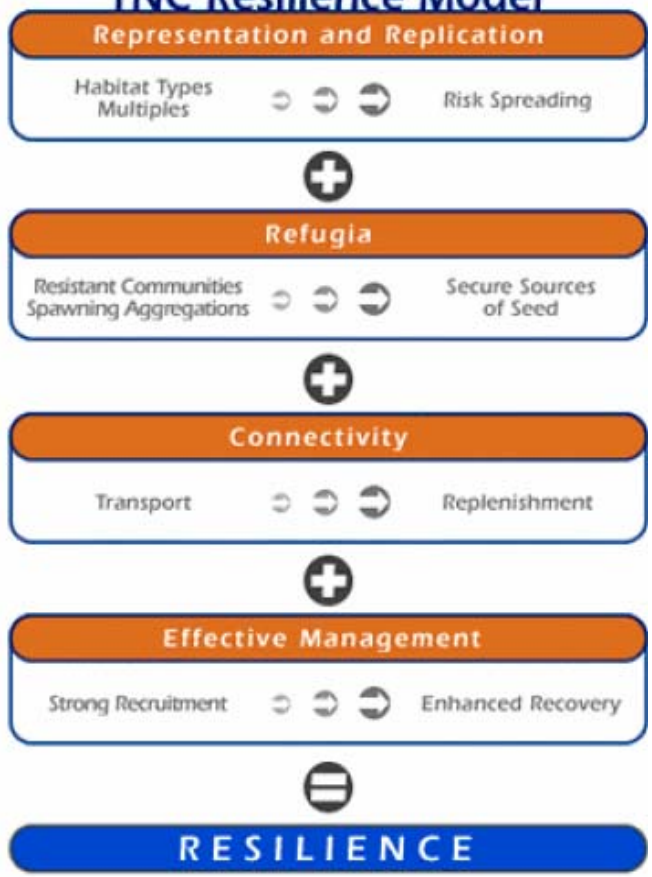

Shading

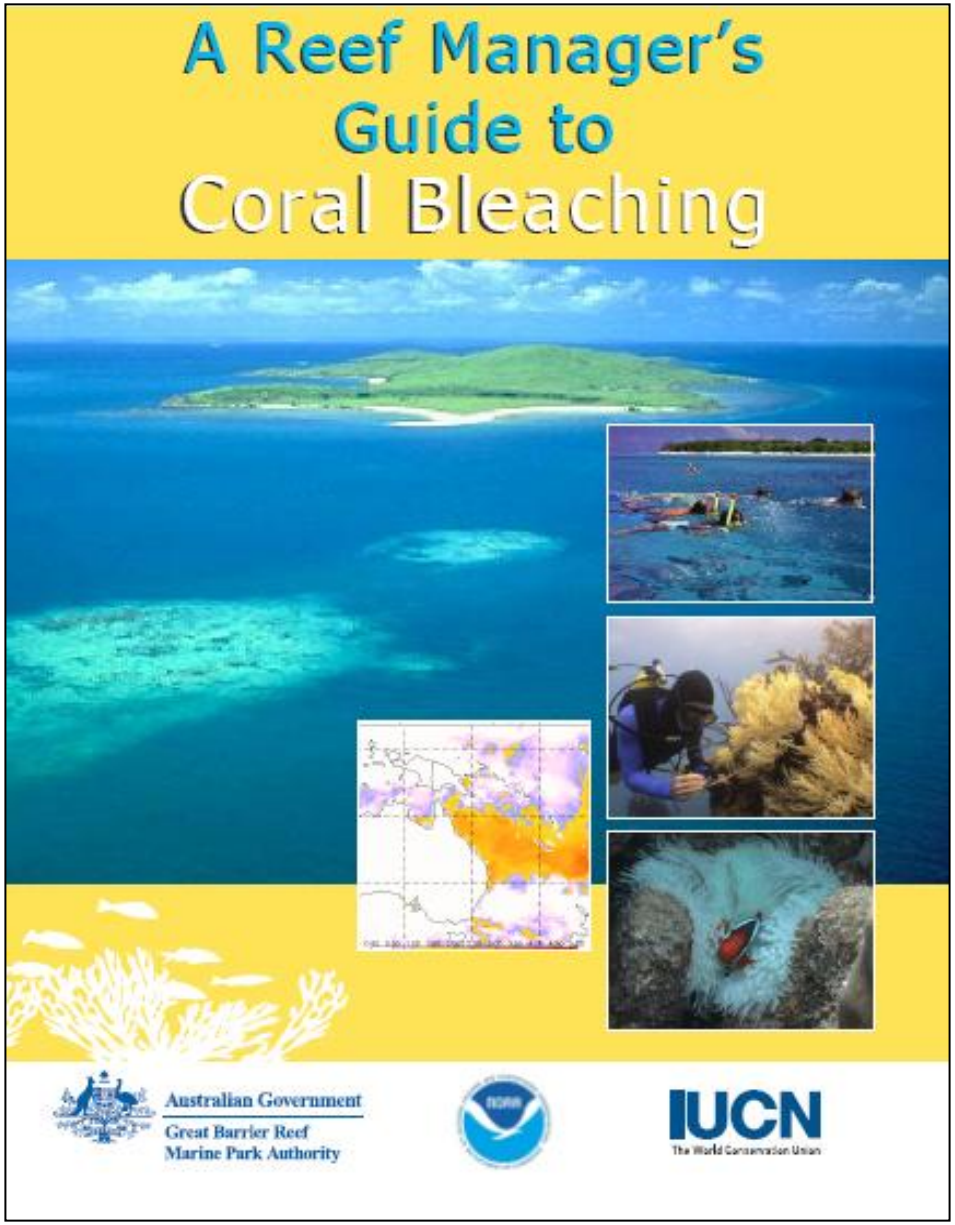
Longer-Term Planning for Resilience: MPA Design

Decision Tree (Done et al. 2001)



TNC Resilience Model




A Reef Manager's
Guide to
Coral Bleaching
Australian Government
Great Barrier Reef
Marine Park Authority
IUCN
The World Conservation Union