

Project 3.1.1 Implementation of the crown-of-thorns research strategy: Regional strategies

Project Summary

Crown-of-thorns starfish (COTS) management requires decisions to be made about where to invest control effort in order to achieve regional scale objectives, e.g. to modify COTS spread or to facilitate coral recovery. However, we have no objective basis for choosing sites exists, beyond their economic importance, meaning that achieving these important goals is largely left to chance. This project will leverage past and current research to develop a decision support framework to assist in prioritizing reefs for control and for assessing alternative strategies by integrating the full range of ecological and management information available. Field and desktop research will also be conducted to fill critical knowledge gaps and to assess the prospects of new control technologies.

Problem

Decisions about where to invest control effort must be made at two distinct spatial scales. Regional scale outcomes, e.g. preventing COTS spread or minimizing COTS impact, require decisions about where within a region investing in control will produce the desired outcomes. Currently managers have little to guide them in terms of how best to distribute their management effort at Regional scales and no means of assessing the likely outcomes of the alternative options available to them. Consequently, past investment choices, beyond the protection of economically important sites, have not been optimal.

How Research Addresses Problem

This project will develop a Regional Scale Decision Support Framework to assist in choosing where within a region (i.e. in which local area) to invest in control. This work will build on the connectivity models developed under a series of previous projects. These static, physical models will be refined to improve their spatial resolution and to make them dynamic (i.e. able to reflect seasonal and annual variation). These will then be integrated with population models to provide updatable ecological realism. Finally, these will be packaged into a user friendly format to allow for their use in designing and assessing management strategies.

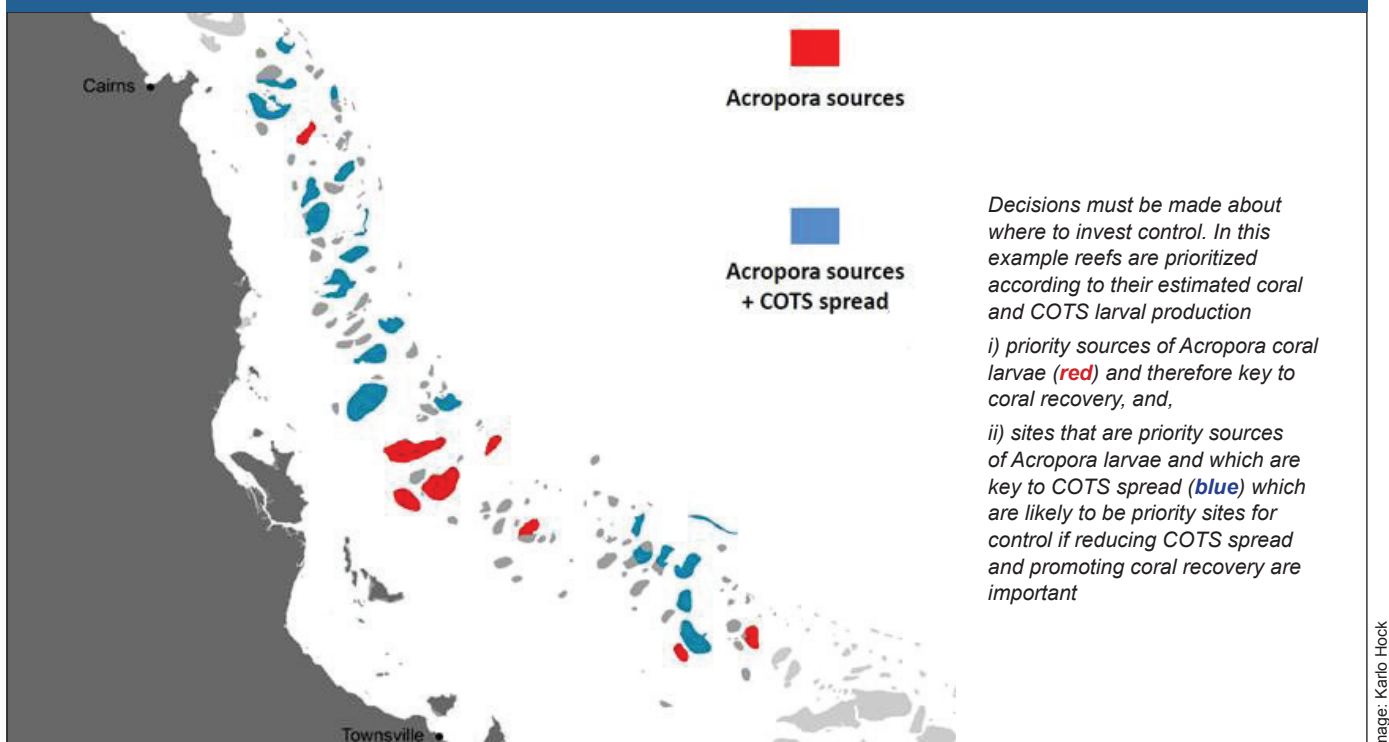




Photo: Morgan Pratchett

Crown-of-thorns starfish outbreak on Rib Reef

The project aims to reduce the loss of coral cover on the Great Barrier Reef (GBR) through improved population-level control of COTS enabled by the integration of COTS and coral population dynamics and dispersal and control capabilities, both reducing overall direct damage from COTS and facilitating greater reef resilience and capacity to deal with other threats.

- The DST will permit the development of performance criteria that more accurately reflect the objectives of the control program than do the current metrics, number of COTS killed. Criteria such as COTS killed per unit effort (CPUE) are currently being explored and criteria based on overall program objectives, e.g. predicted coral recovery, will also be explored.
- Because the DST will model both the ecological and the management processes related to the COTS Control Program, it will permit assessment of the costs associated with different control strategies allowing for more accurate planning of regional level control activities.
- Current on-water management practices will be refined, through improved spatial and temporal targeting of management actions, to reduce COTS impacts on key assets and increase efficiency.
- The southward spread of the current outbreak will be more effectively managed by improved site-level control and early-warning surveillance strategies.
- Management decisions will be made on the basis of predictions related to the objectives of the program, e.g. likely coral cover and diversity outcomes, rather than simple assessments of the number of COTS killed.
- Development of strategies that would minimise the impact of COTS or reduce the potential for the initiation of outbreaks potentially including approaches such as flexible zoning or fisheries management strategies such as size or bag limits of confirmed predators during outbreaks or in the initiation box.
- Refined design of control programs to account for the influence of deep reefs.
- Decision making about control technology development based on an understanding of current prospects for biocontrol and gene technologies.

Further information

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