Hub

Northern Australia Environmental Resources

Case study title

Managing North Queensland's endangered tropical littoral rainforest

Project number(s) & project title(s)/or Hub activity

Project 2.2 Mapping to underpin management of tropical littoral rainforest (12mth project, complete)

Short version

This project produced fine-scale maps of the current extent and distribution of critically endangered littoral rainforest in Queensland's Wet Tropics, and a mapping method. It also produced overlay maps showing potential flooding associated with climate change. The research has informed the draft Recovery Plan for this ecological community, and the mapping is being used by state and local government. The mapping method could also be used to define littoral rainforest throughout Queensland. The overlay maps have significantly improved our understanding of the threats to littoral rainforest from sea-level rise, storm surge and extreme weather events, and are being used, along with the base mapping, to improve policy, planning and on-ground action to better protect and manage this unique forest.

Example of critically endangered littoral rainforest (photo Andrew Ford).

Narrative

Littoral rainforest occurs at the interface between terrestrial and marine systems, protecting communities and infrastructure from erosion, and providing many ecosystem services such as mitigating flooding and providing specialised habitat for species such as cassowaries. Because of its coastal location and fragmentation, littoral rainforest is vulnerable to interacting effects of extreme storm events, sea-level rise and changing land-use. It is listed as Critically Endangered under the Environment Protection and Biodiversity Conservation Act 1999. The EPBC Act listing advice describes the broad characteristics of the community, however fine-scale mapping and an assessment of key threats was required by a number of research users in order to determine its exact location and extent, to assess climate change impacts, and to prioritise areas for management.

This project addressed an Australian Government priority research area and the work has been used directly by the Department of Environment and Energy to inform the draft Recovery Plan for 'Littoral rainforest and costal vine thickets of eastern Australia'.

The research has provided the Department of Environment and Energy, the Queensland Parks and Wildlife Service, the FNQ Regional Organisations of Councils and Local Councils with fine-

scale mapping layers and an agreed method and template method to map littoral rainforest occurrence in the field, as well as a good understanding of the potential spatial impacts of storm surge, sea-level rise and coastal flooding on the forest. This is assisting them to improve policy, planning and management for the forest as well as to evaluate the potential impacts of proposed developments and climate change.

For example, the project team worked with Cairns Regional Council to help identify littoral rainforest patches in intensively developed beach suburbs where coastal vegetation is often subject to many varied pressures. The Council is now equipped to make their own assessment of patches which are mapped as 'potential' littoral rainforest so they can be managed appropriately to retain the values that littoral rainforest provides, and in accordance with the EPBC Act.

Researchers are working with Queensland Herbarium staff to update regional ecosystem mapping, and specifically to annotate regional ecosystem descriptions to note if littoral rainforest is present or potentially present in an area. Regional ecosystem information and maps are essential tools for business, governments, landholders and organisations to plan and manage developments, the natural environment, vegetation restoration and carbon farming. The information is also used for the *Vegetation Management Act*, *Environmental Protection Act*, the *Environment Protection and Biodiversity Conservation Act* and to determine the regional ecosystem status.

It's now easier for Queensland National Parks staff to understand what forest types they have on their land throughout the Wet Tropics, their resilience to future storm surge and sea-level rise, and how to better manage them. In another example, the project team, with the assistance of Queensland Marine Parks staff, assessed several Great Barrier Reef island National Parks for the presence of littoral rainforest where there is currently no regional ecosystem mapping. These assessments provided Parks staff with new knowledge about the distribution of this endangered ecological community on their estate.

The research has been used to inform a National Climate Change Adaptation Research Facility NCCARF CoastAdapt case study, and Terrain NRM and the Wet Tropics Management Authority have expressed interest in using the work.

The methodology for mapping littoral rainforest produced by the project could be applied throughout Queensland to provide greater clarity about the location of this critically endangered ecological community and enable improved management.

Research outputs

- Fine-resolution maps of the current extent and distribution of littoral rainforest types in Queensland's Wet Tropics
- Fine-resolution mapping of inundation associated with sea-level rise and a range of storm-surge scenarios
- A mapping methodology that can be applied to defining littoral rainforest throughout Queensland
- 4-page plain English factsheet summarising the research available here
- 56-page technical report available here
- Data layers are available here (to date these have been downloaded at least 18 times)

Attributions

This project was led by Dr Helen Murphy, CSIRO, Atherton Laboratory with support from Jeremy VanDerWal (JCU), Andrew Ford (CSIRO) and Erin Graham (JCU).