



Decision support software for prioritising management actions on Western Australia's islands

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Background

Western Australia has over 3,700 islands, ranging in size from small rocky outcrops to the largest, Dirk Hartog Island, at 58,640 ha. Many of these islands are important for the threatened and endemic species they support. For several species of native fauna, some islands are the last refuges from threats posed by invasive species such as foxes, black rats and feral cats. Many islands also provide critical breeding habitat for seabirds and sea turtles, and some contain culturally significant sites.

Unfortunately, some islands have been colonised by invasive weeds such as buffel grass (*Cenchrus ciliaris*) and introduced animals such as black rats (*Rattus rattus*). In addition, the increased use of islands by both the public for recreation and industry for resource extraction and supporting infrastructure confers an increased risk that invasive species will be introduced to islands. Invasive species are the biggest single cause of loss in native species from islands across the globe.

With so many islands to manage, it is important that Parks and Wildlife has a system in place that assists in the prioritisation of management actions to maximise the conservation outcomes achieved given limits to resources and on capacity.

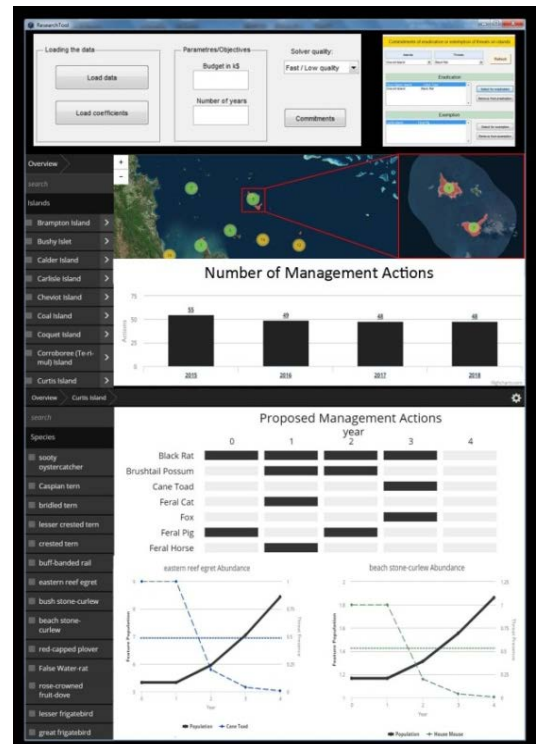


Montebello Islands. Photo credit: K. Morris

Developing decision support software

From 2012 a team of researchers from Parks and Wildlife's Science and Conservation Division and James Cook University (Townsville, Queensland) has been developing databases linked to decision support software that will assist island managers in prioritising management actions to mitigate the adverse effects of invasive species on Western Australian islands. The software is designed to maximise conservation outcomes for a given budget, as well as estimating the funds required to achieve explicit objectives for the persistence of native species on islands.

During software development, the research team has been focusing on the Pilbara islands between Exmouth Gulf and Eighty Mile Beach, and southern Great Barrier Reef islands. Because these two groups of islands are markedly different and managed by different agencies, testing the outputs generated from the software will improve the utility, quality, reliability, and credibility of the priorities that are recommended. Ultimately, the software will be applicable more generally, both to islands and mainland areas.



Graphic representation of Version 1 of the decision support software

Information required for input into the software includes distribution and abundance of desirable island features (e.g. nesting turtles) and threats (e.g. rats), as well as interactions between features and threats, and the cost and effectiveness of actions to ameliorate or control the threats.

Findings

To date, two major project milestones have been completed. A database containing over 57,000 historical records of native and introduced species on Pilbara islands has been completed. Pilbara regional staff continue to contribute new knowledge and data to the database. However, as in any region, large geographic and temporal gaps in our knowledge of species remain for the Pilbara islands.

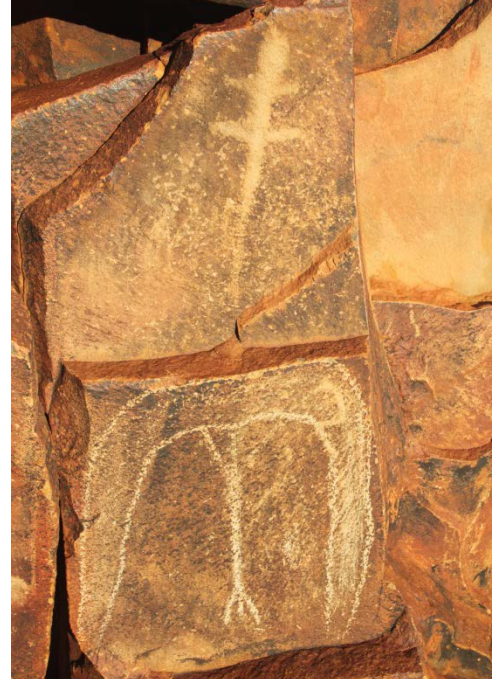
Version 1 of the decision support software is functional and currently being refined and tested to ensure the software generates realistic recommendations for island managers.

Over the next 3 years the team will also generate the first high resolution habitat maps for the islands, predictions of which islands are most susceptible to invasive species, and estimates of the cost and value of implementing biosecurity actions on each of the Pilbara islands.

Management Implications

This research project is generating outputs that will influence conservation actions on islands in Western Australia including:

- A single comprehensive database that gives Parks and Wildlife staff and other researchers ready access to over 100 years of knowledge about Pilbara island characteristics, fauna, flora, threats, and other features. These data will inform future survey requirements and effort.
- Training sessions to develop the capacity of Parks and Wildlife staff to apply the software to deliver efficient management of the island conservation estate.
- Software that will allow decision-makers and managers to make evidence-based, accountable, timely and cost-effective decisions to ensure the conservation of our State's idyllic islands and their native species whilst maintaining their recreational and industrial values.
- Identification of threats from invasive species to enable mitigation actions and improved recovery of native species.
- A risk-based strategy that informs the need for surveillance on selected Pilbara islands to detect new arrivals and the establishment of invasive species.
- A strategy, informed and influenced by managers, for balancing the investment of available resources in quarantine, surveillance, and control/eradication of non-native wildlife on Pilbara islands.



Features of the Dampier Archipelago. Photo credit: K. Morris