

Cost-Benefit Analysis of the Yellow Crazy Ant Eradication Program

This is a summary of a cost-benefit analysis of the Wet Tropics Management Authority's Yellow Crazy Ant Eradication Program. It was completed by Daniel Spring, Tom Kompas and Richard Bradhurst from the Centre of Excellence for Biosecurity Risk Analysis at Melbourne University in March 2019. The analysis was a requirement of the Australian Government's National Landcare Program, which funded the Eradication Program. The full report can be found on our website at wettropics.gov.au/funding-requirements.

Benefits of the eradication program

The environmental and socioeconomic benefits of yellow crazy ant eradication are likely to far outweigh the costs of the program. Over the next 30 years, the eradication program's net present value is calculated to be \$6.1 billion and the benefit to cost ratio is 178:1 at 7% discount rate. These values increase to \$9.8 billion and 254:1, respectively at a 3% discount rate.

If environmental benefits are excluded, the Eradication Program still has significant socioeconomic benefits for agriculture, tourism and households in the Wet Tropics. Over the next 30 years, the net present value and benefit to cost ratio of the Eradication Program are \$513 million, and 16:1 at a 7% discount rate, and \$823 million and 22:1 when the discount rate is reduced to 3%.

What does the cost-benefit analysis measure?

The cost-benefit analysis compares the financial cost of the Eradication Program with the environmental and socioeconomic costs of the impacts of yellow crazy ants if they are allowed to spread over the next 30 years, unchecked by a coordinated eradication program. More specifically, the analysis calculated the following annual costs:

- Domestic pesticide costs at \$220 per year per household.
- Willingness to pay per household to avoid contact with yellow crazy ants at \$302.58.
- Pesticide costs for selected agricultural industries in the project region (mainly sugar cane) at \$300 per hectare.
- Wellbeing losses to visitors from the risk of contact with yellow crazy ants at \$24 per person per visit.
- Willingness to pay \$38.42 per household on average, to avoid the extinctions of seven native species.
- The cost of the Eradication Program is based on the Authority's estimate of \$42 million over seven years. This becomes \$34.6 million at a 7% discount rate and \$38.5 million at a 3% discount rate.



Yellow crazy ants are one of the world's 100 worst invasive species. Image is of a yellow crazy ant nest in Cairns, Queensland, Australia.

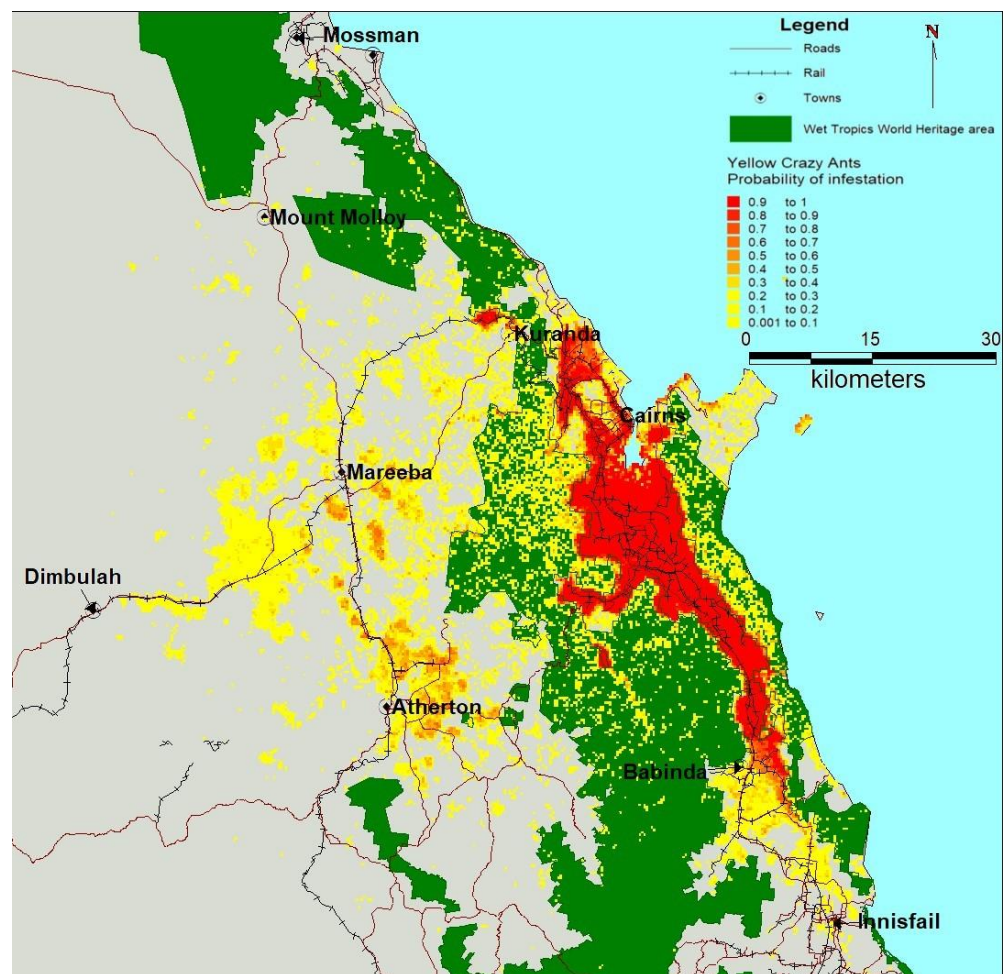
Additional considerations

The findings of the cost-benefit analysis were calculated in the context of the following considerations:

- The cost-benefit analysis remains highly conservative in estimating the environmental benefits. There was no consideration of ecosystem services lost.
- Eradication is a more feasible and cheaper option than long term control of yellow crazy ants to keep them out of the Wet Tropics World Heritage Area.
- The Australian Government recommends the use of a 7% discount rate for biosecurity projects, which includes cost of borrowing and a risk component.
- The cost-benefit analysis was informed by an independent review of the Eradication Program to June 2018. The review concluded that the eradication of yellow crazy ants in the Wet Tropics remains feasible. It stated that the Authority had demonstrated a capacity to effectively manage the Eradication Program.
- Two main risks to eradication were identified:
 - Human assisted spread of yellow crazy ants.
 - The potential failure of treatment methods, particularly the ability to detect and remove the last remaining yellow crazy ants.

Spread model of yellow crazy ants over 30 years

To estimate the economic benefits of eradication, a model was developed to estimate the spread of yellow crazy ants if eradication efforts ceased. In addition to considering spatial spread, the yellow crazy ant spread model explicitly considers the growth of their abundance over time. Movement of yellow crazy ants can occur through diffusion across the landscape, as well as sporadic human assisted movement through cane machinery and other means, and downstream water movements such as rafting. While most of the probable spread is in areas of human habitation and agricultural land, large areas of the Wet Tropics World Heritage Area are also at risk.



Map of the spread modelling for yellow crazy ants over 30 years: This map shows the probabilities of yellow crazy ant infestation based on 50 simulations of spread over 30 years. Red sites have the largest probability, orange sites have intermediate probability and yellow sites have the lowest probability.