Incorporating passive surveillance into invasive-species management programmes

Oscar Cacho and Susie Hester

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AARES Conference 2016
Canberra

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cebra
Centre of Excellence for Biosecurity Risk Analysis

une
University of New England

Background

- Passive surveillance by members of the public can reduce total program costs and increase the probability of success in managing pests
- It contributes to the effectiveness of active (structured) surveillance by allowing better targeting of search effort
- It is activated and maintained through public awareness campaigns and incentive schemes
- Little is known about the return on investment for public awareness campaigns

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Report a Pest

Have you seen an invasive species?

REPORT IT!

Contact MISC if you have seen one of the threats listed on this website:
(Priority Pests and Early Detection Pests)

Maui Invasive Species Committee

Photo guide to weeds

- African boxthorn
- African fountain grass
- African lovegrass
- African tulip tree
- Aleman grass
- Alligator weed
- American mangrove
- American rat's tail grass
- Anchored water hyacinth
- Annual ragweed
- Arrowhead vine
- Athel pine
- Badhara bush
- Balloon vine
- Bamboo
- Barleria
- Basket asparagus fern
- Bathurst burr
- Bellyache bush
- Bitou bush

Miconia (Miconia spp.)

Miconia leaves and fruit

Miconia plant form

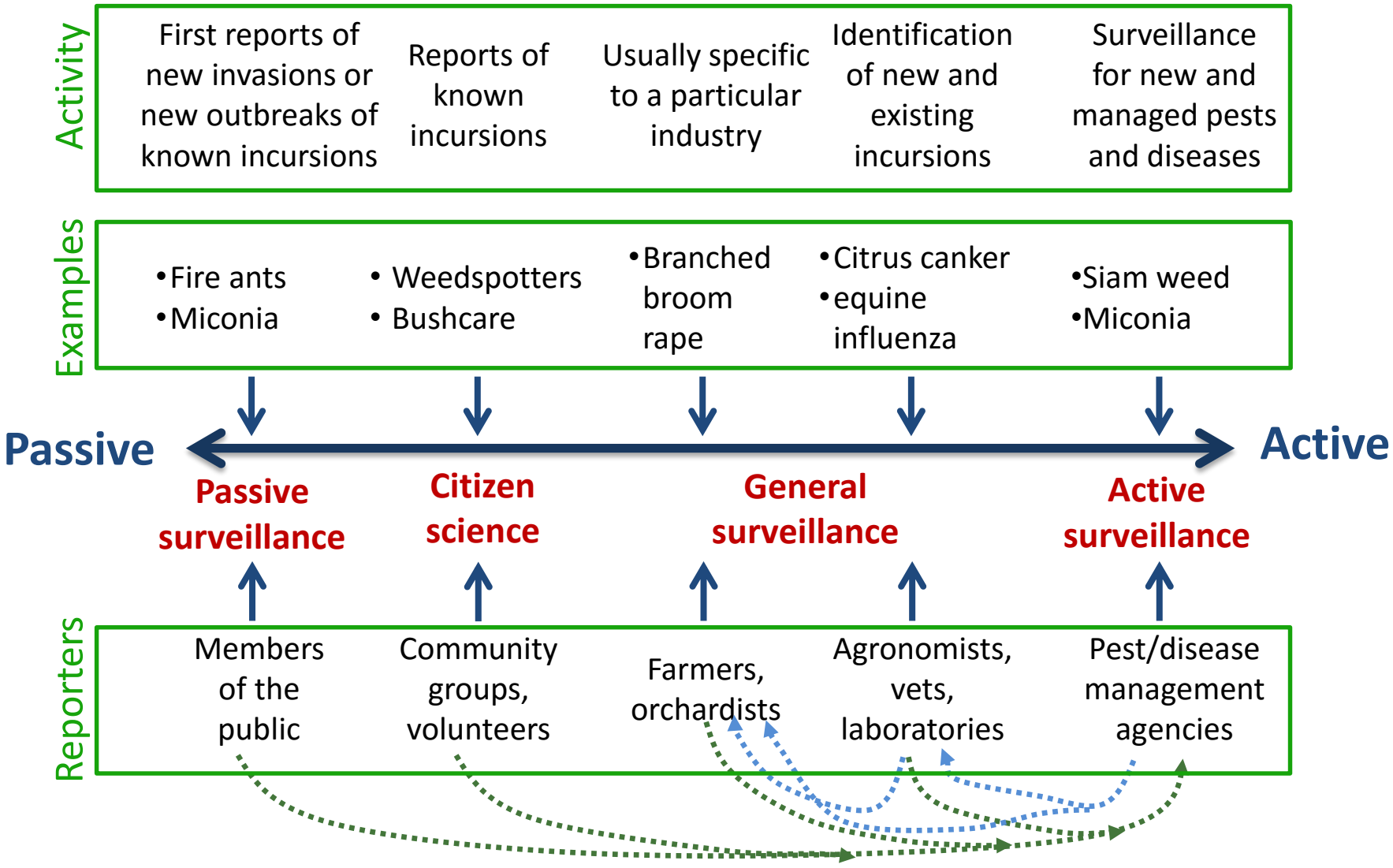
Miconia flowers and leaves

Miconia leaf underside

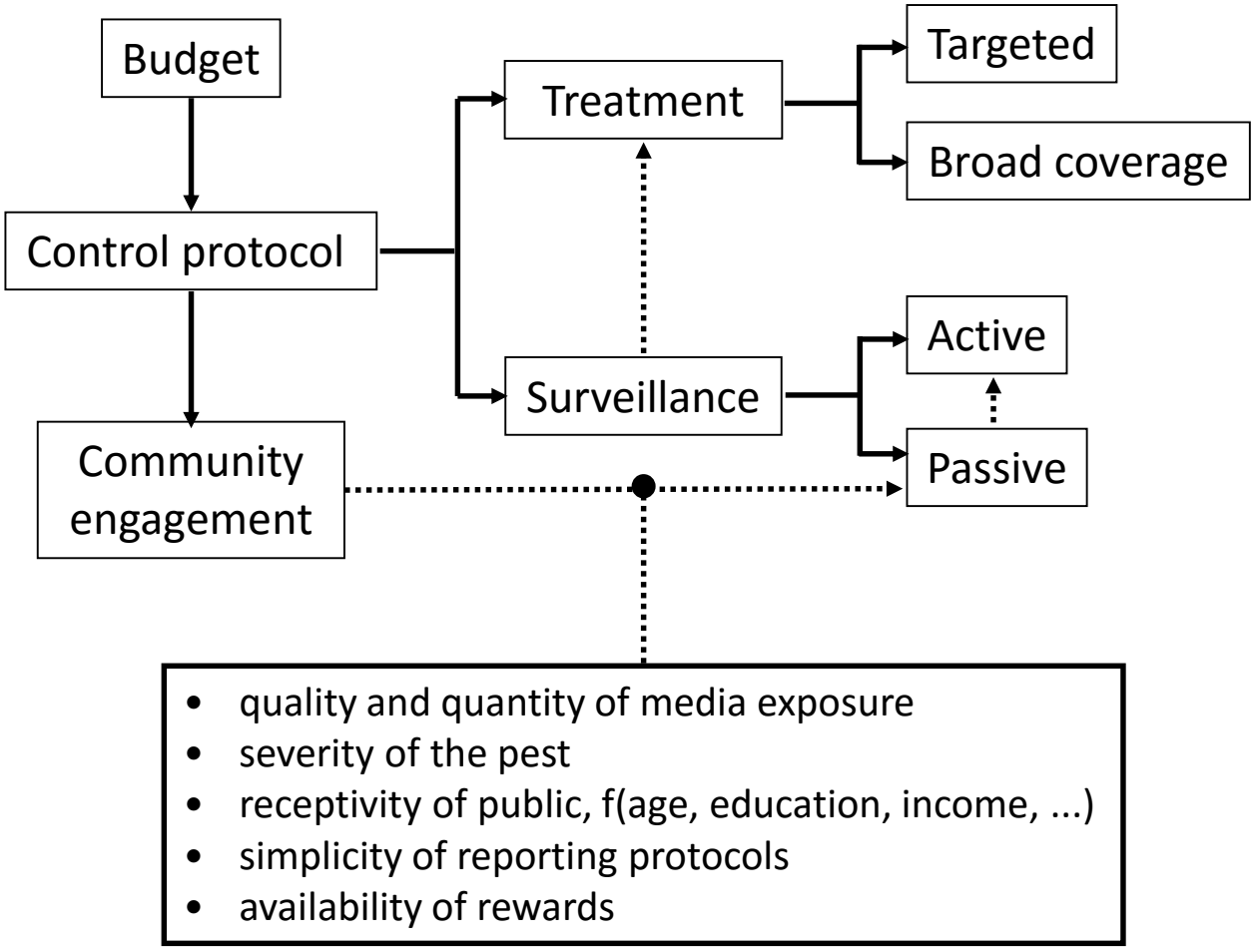
Pest alert

If you have seen this weed, contact the Customer Service Centre.

The surveillance continuum



Where does passive surveillance fit in?



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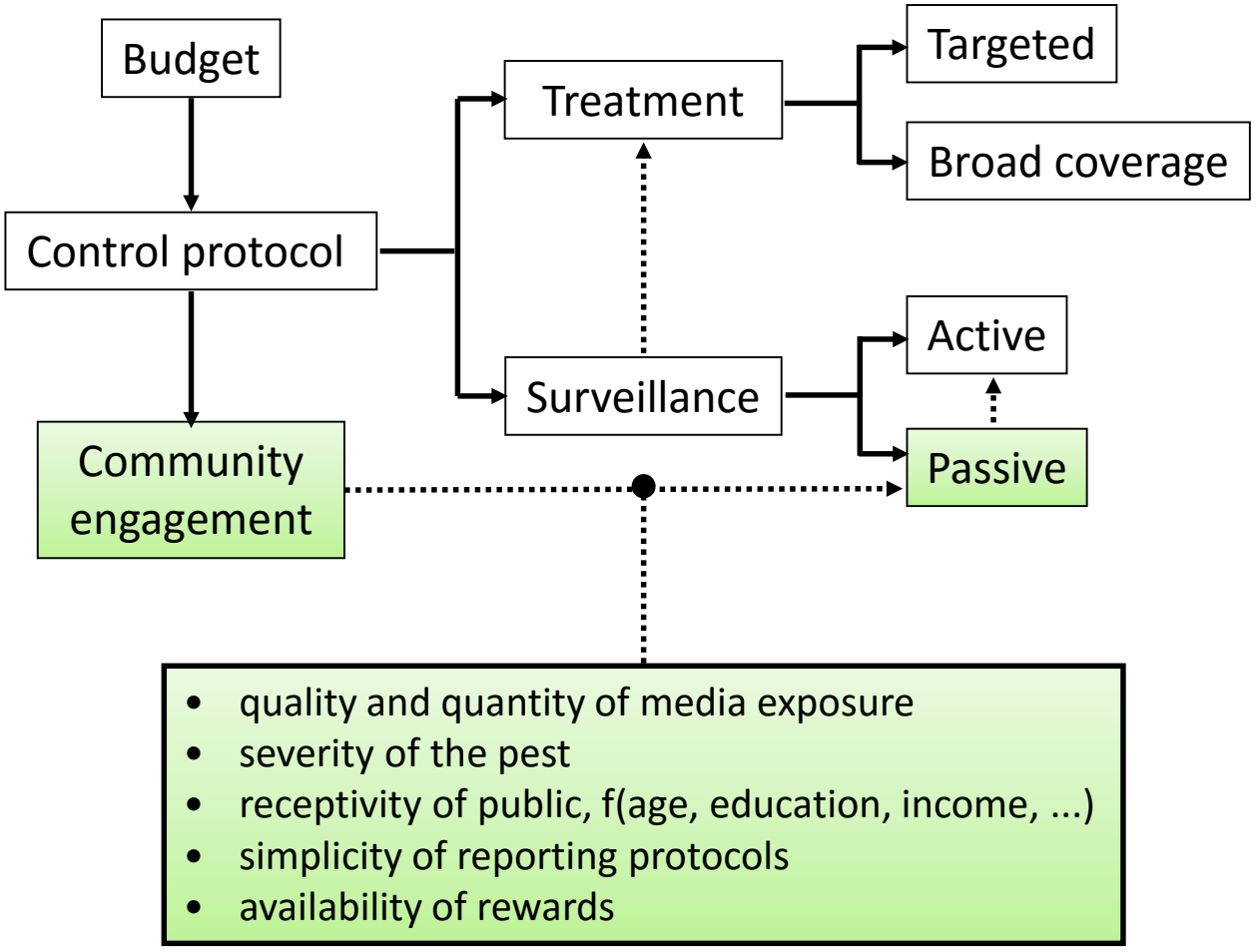
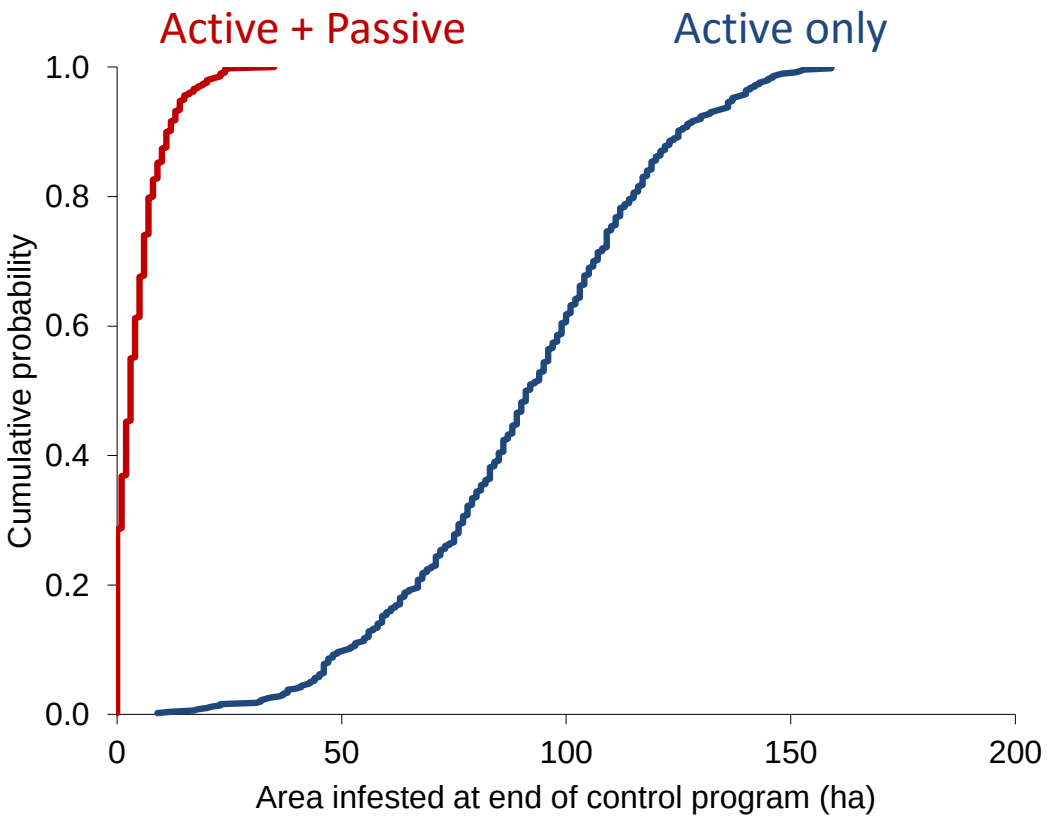


What we would like to know.....

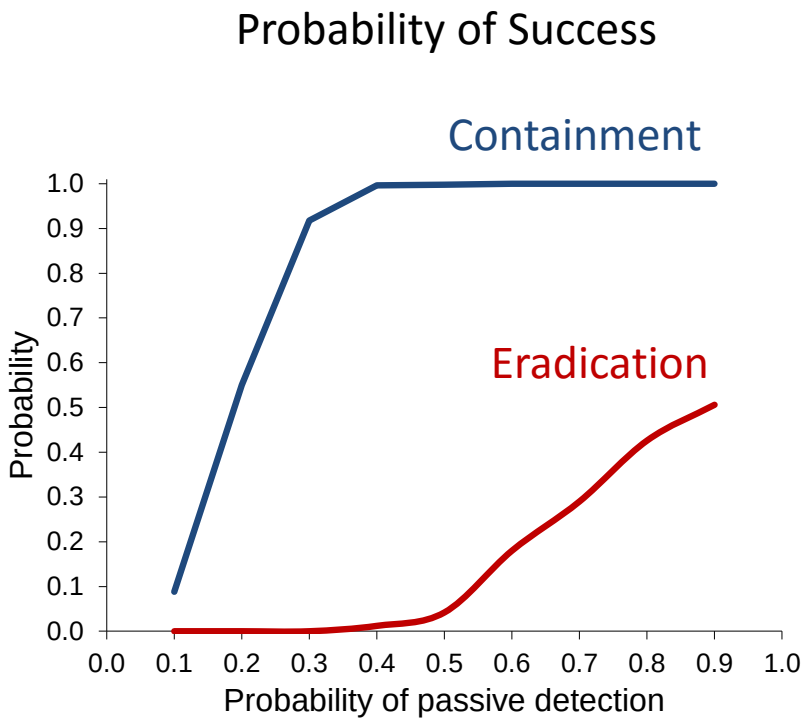
- What is the return on investment in public awareness?
- What is the likelihood that particular types of people will report pests?
- What is the reliability of these reports?
- What types of public engagement activities work best?
- How can we measure the probability of detection?
- How can we use passive surveillance to delimit an incursion?

Effect of passive surveillance on probability of success



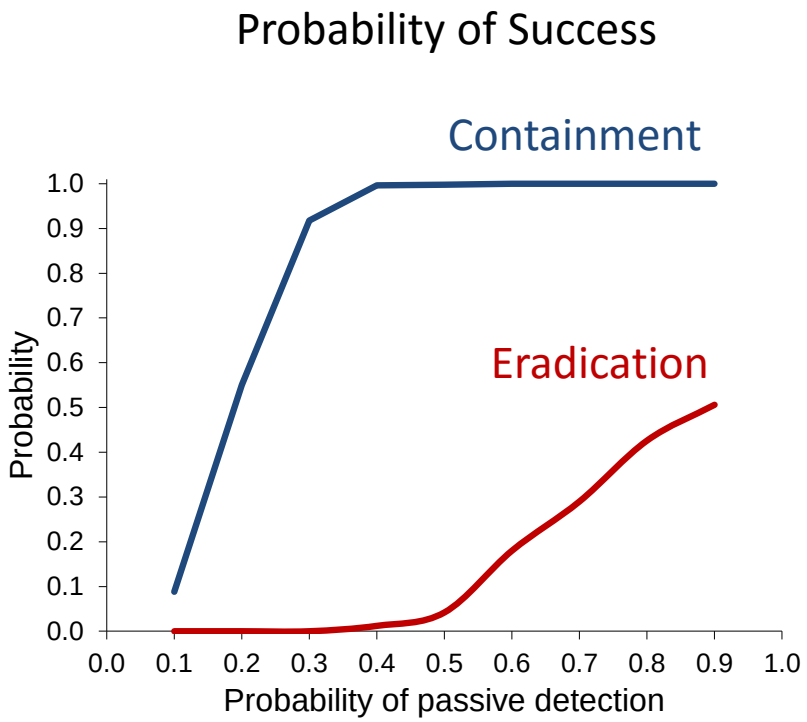
Simulation results for 10-year program (Cacho et al. 2010)

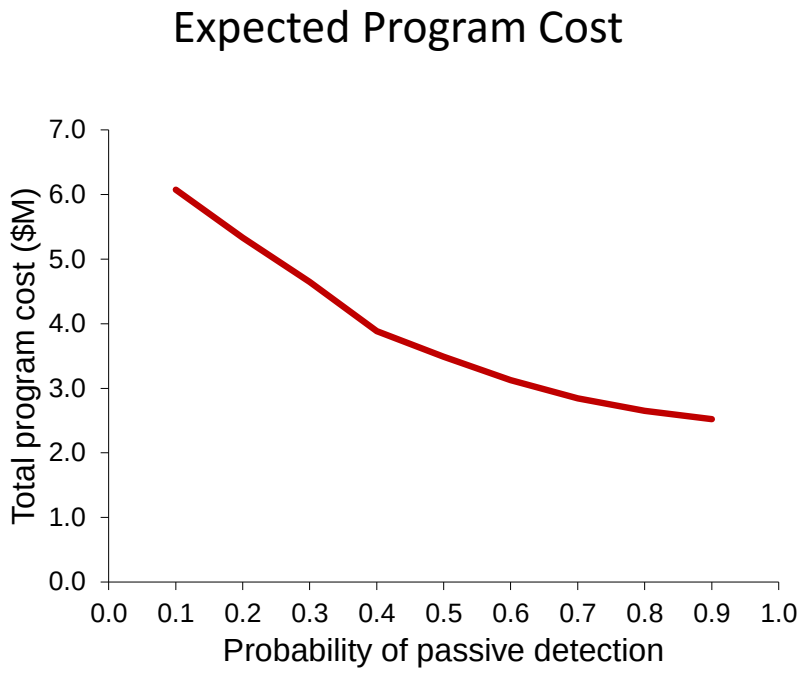
Effect of passive surveillance on cost of success



Based on models of spread, habitat suitability and detectability (Cacho et al. 2010)

Effect of passive surveillance on cost of success





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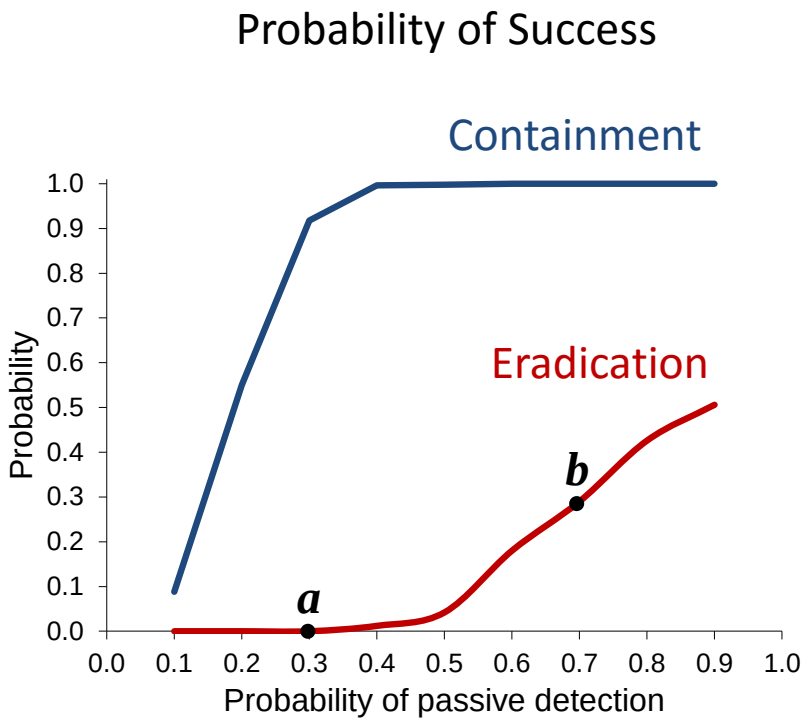

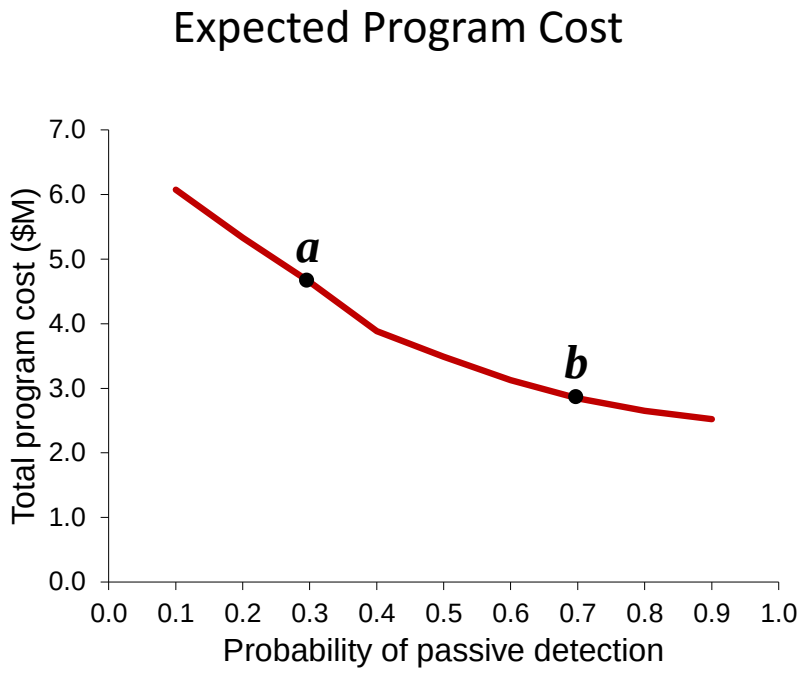

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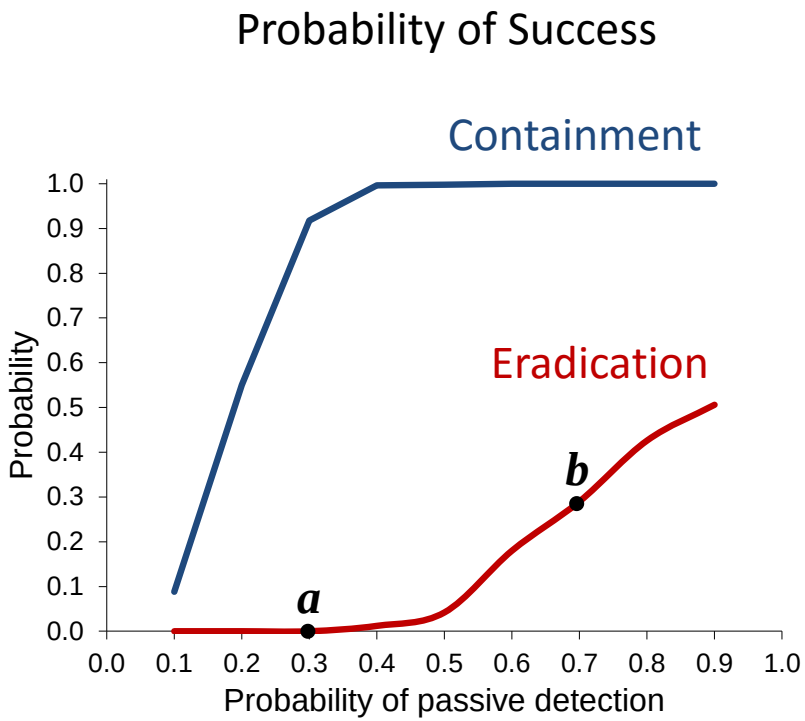
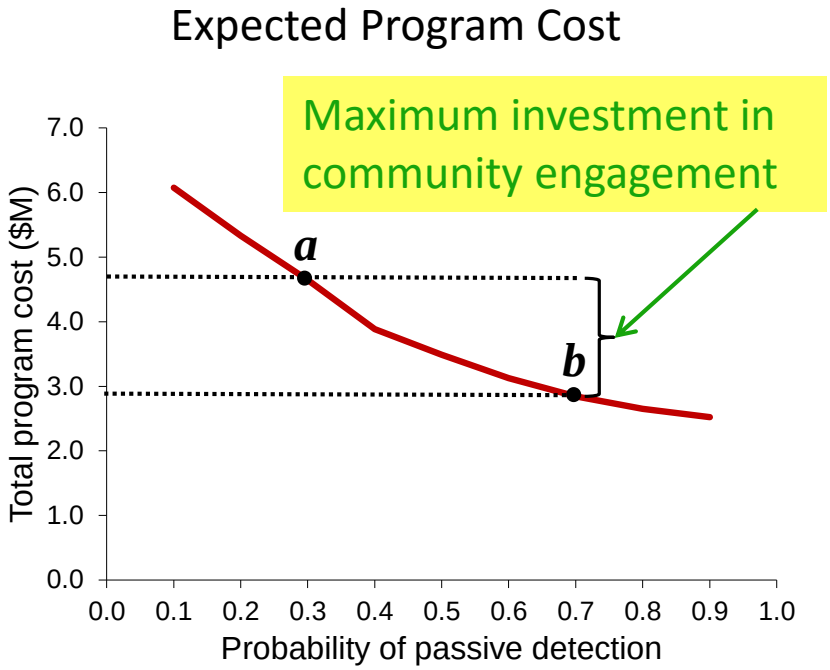
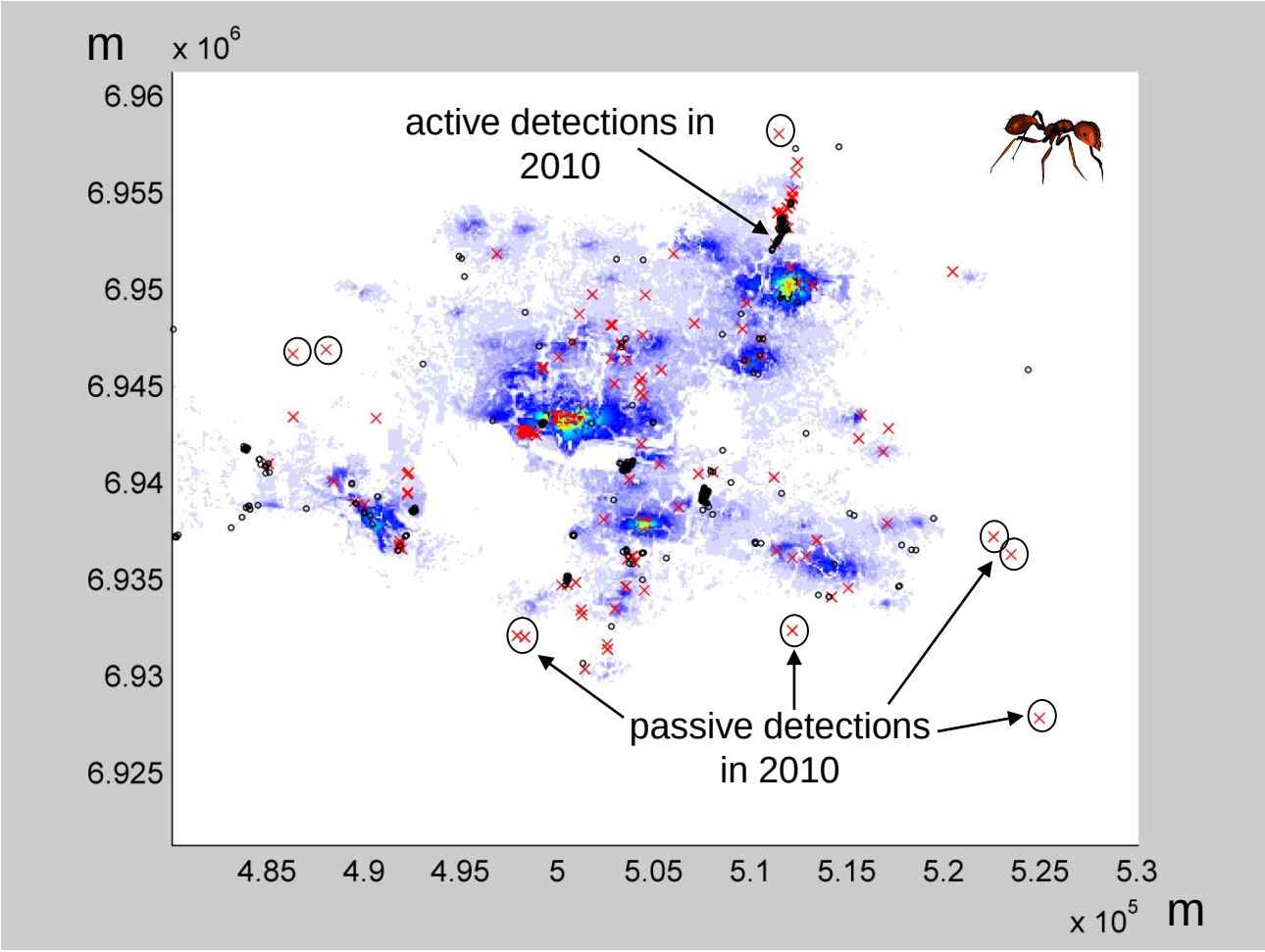
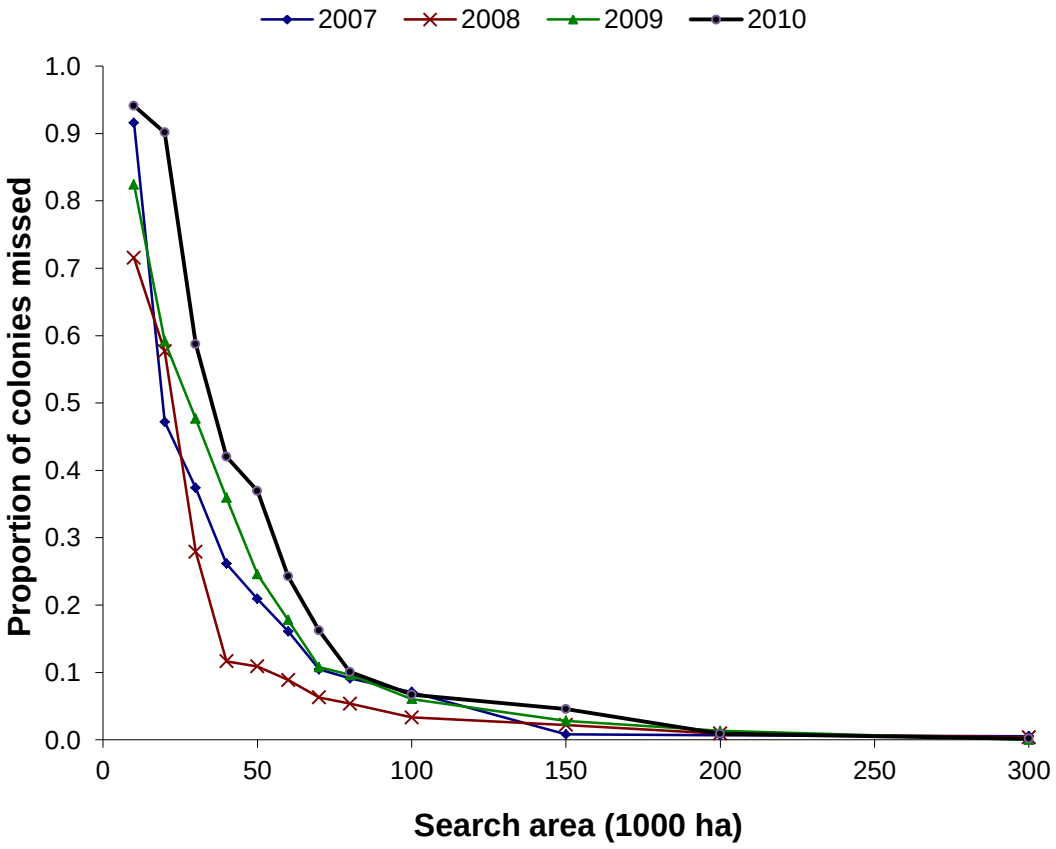




The value of passive surveillance

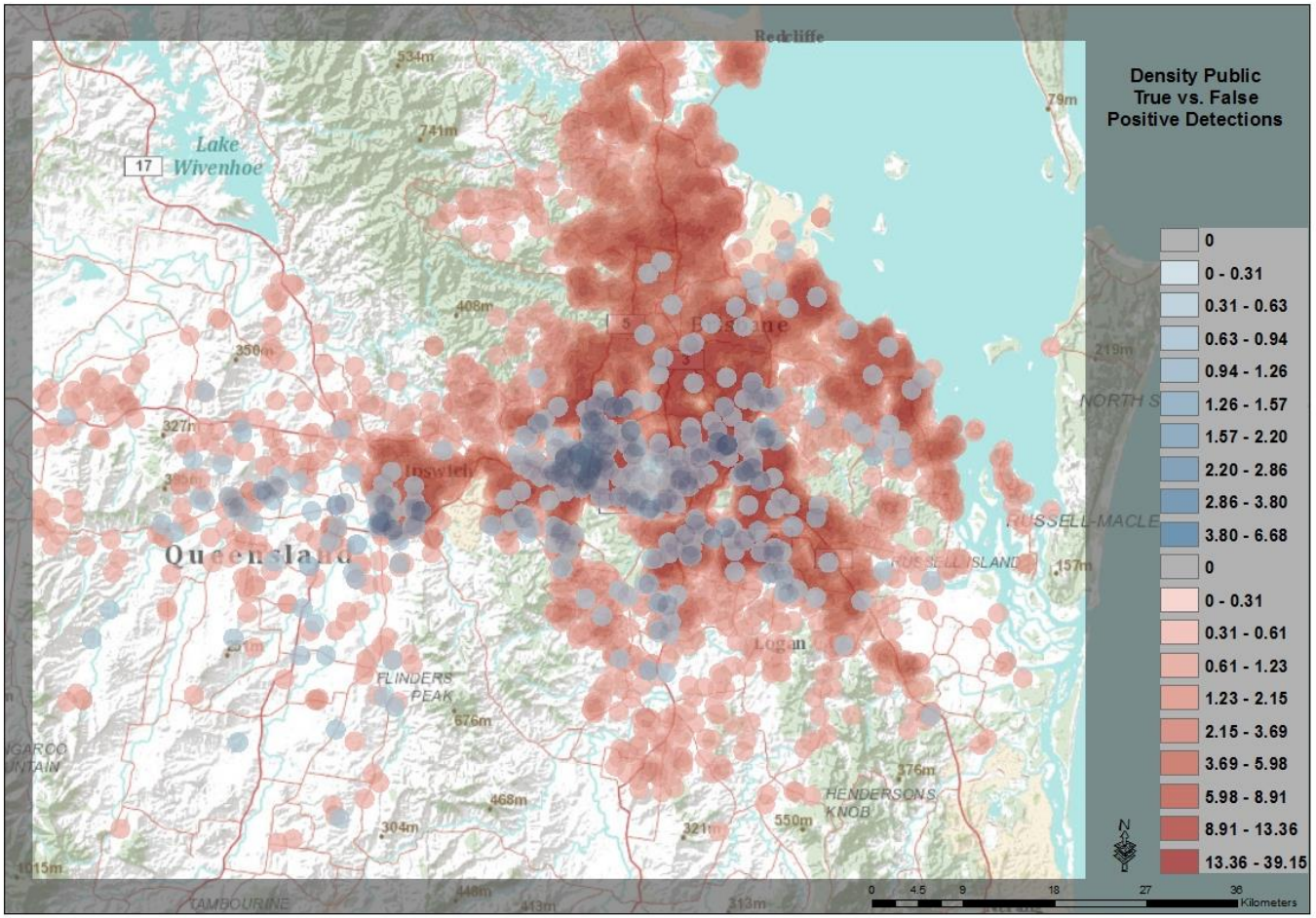


Probability map based on habitat suitability and location of known colonies



$1 million invested in public engagement was estimated to save $60m in active surveillance costs

Density of true and false positives from public reports



Which data should be collected?

- **Date of detection / report**
- **Location of detection** (GPS coordinates, for negative samples as well)
- **Information on the reporter** (where they live, age, education level, occupation, motivation etc)
- **A measure of the age of the incursion** (size/number of plant, % coverage
- Details of **community engagement activities** (type, location, duration, workforce, cost
- ...

Acknowledgements

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