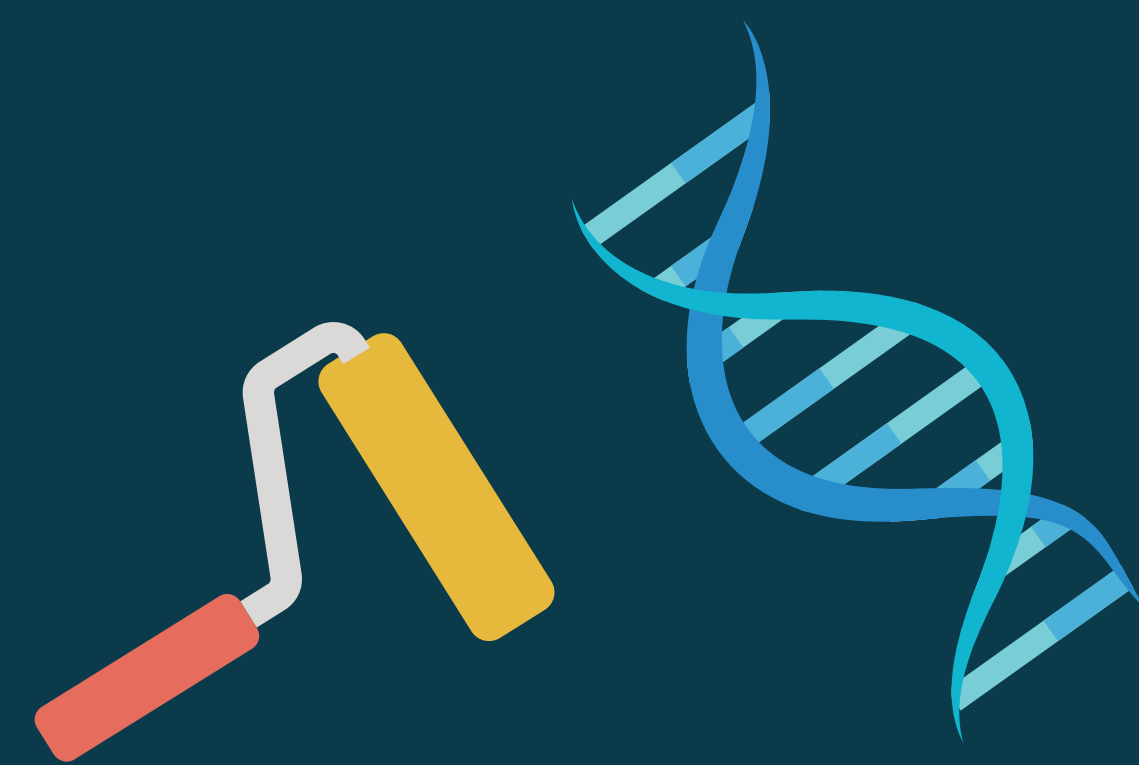
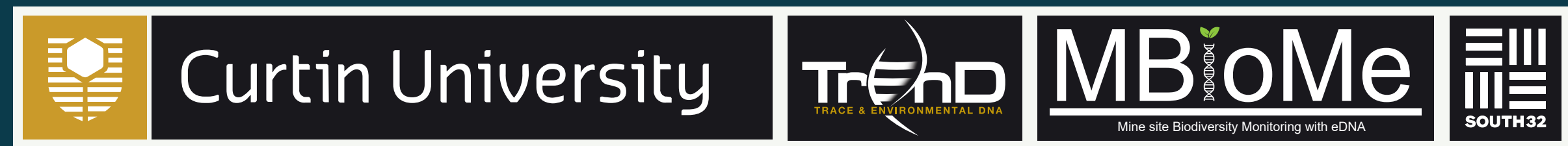


THINKING INSIDE THE BOX: ENHANCING ARBOREAL MARSUPIAL MONITORING IN A POST-MINING LANDSCAPE USING eDNA

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WHAT IS eDNA?

eDNA → Environmental DNA



Diverse genetic sources



Found in a variety of substrates



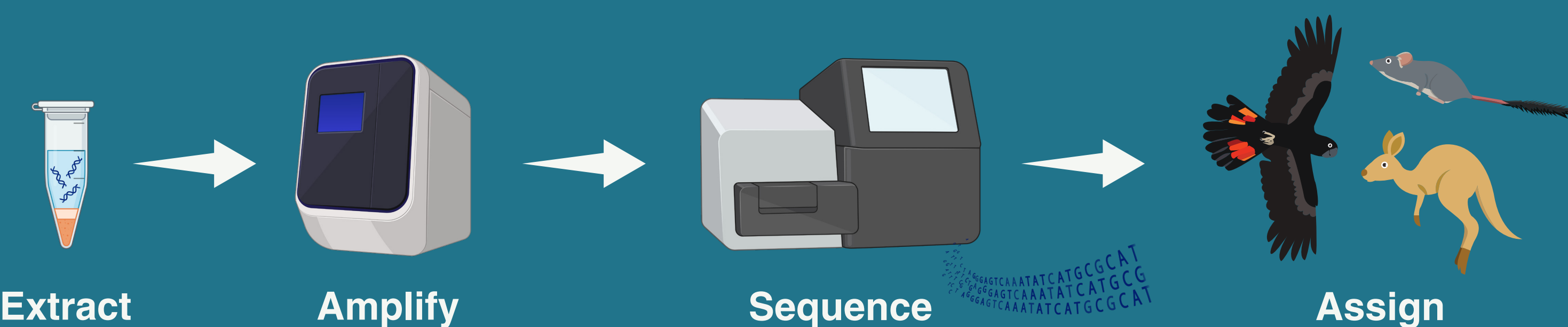
Non-invasive monitoring

METHODS

Roller swab samples were collected from 90 nest boxes installed at the South 32 Worsley Alumina bauxite mine near Boddington, Western Australia, over a two year period (June 2023 to May 2025).

Samples were assessed for arboreal marsupial DNA using both a single-species approach (qPCR assays targeting phascogale species) and DNA metabarcoding (general vertebrate assay).

Detections were compared to visual survey and motion camera data, and related to age of rehabilitation & distance to reference bushland.



OBJECTIVE

Compare the effectiveness of visual surveys, motion cameras, and eDNA for detecting arboreal marsupials in artificial nest boxes, and relate occupancy patterns of nest boxes to a variety of habitat variables.



PURPOSE

The Jarrah Forest of Western Australia is home to many arboreal marsupials, including two conservation dependent species (*Phascogale calura* & *Phascogale tapoatafa*). These species rely on tree hollows for shelter and breeding, which take upwards of 100 years to naturally form. In rehabilitation areas impacted by mining or agriculture, artificial nest boxes may be used as temporary habitat while natural hollows form.

The purpose of this study was to assess the occupancy rate of nest boxes by arboreal marsupials, to determine if nest boxes are suitable as a habitat resource for species in the Jarrah Forest.

Jarrah Forest

RESULTS

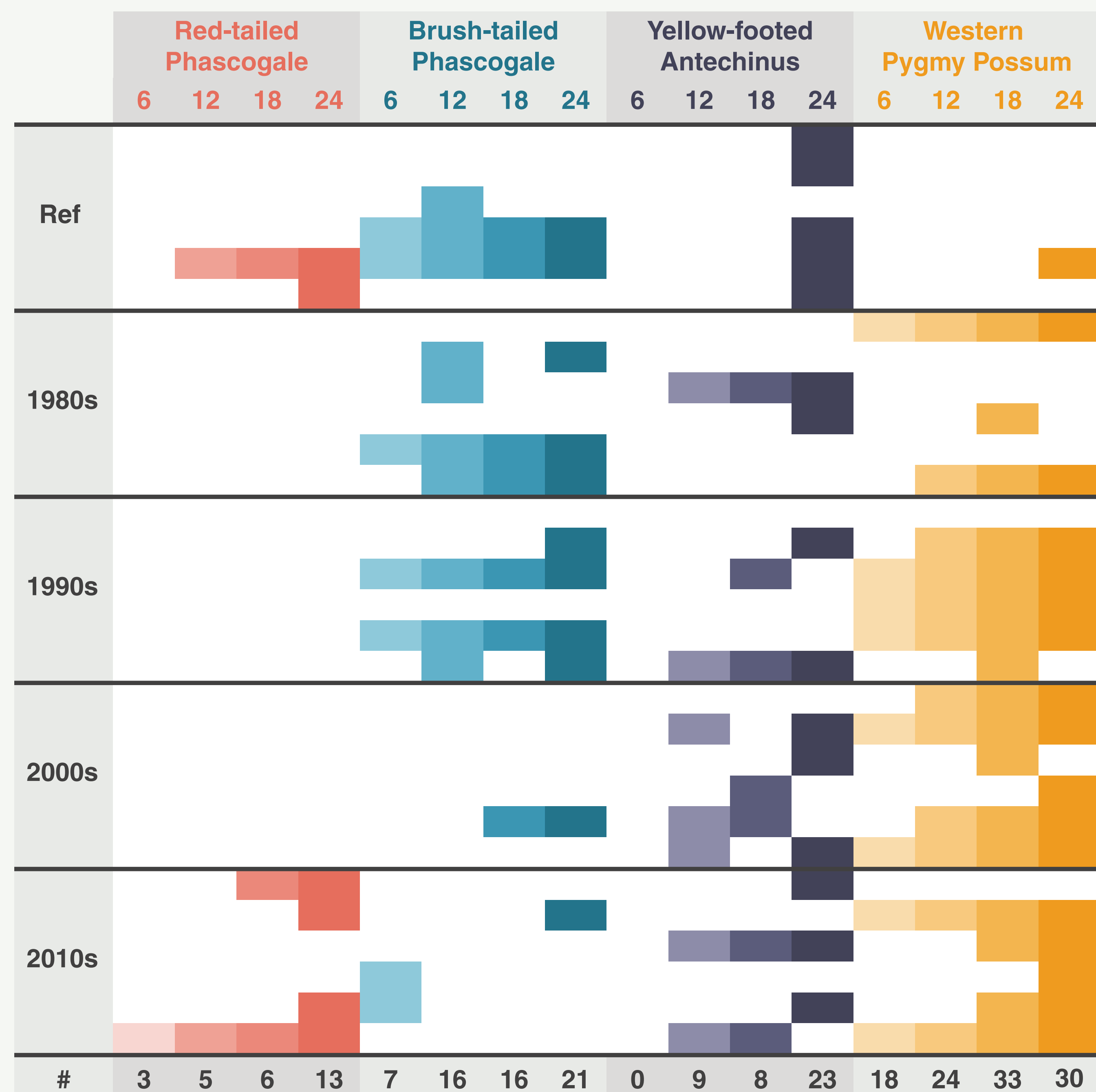


Figure 1. Detections of four arboreal marsupial species from nest box swabs taken over 24 months at South 32 Worsley Alumina bauxite mine, stratified by rehabilitation age. Number of positive detections per sampling event (n = 90) is also shown.

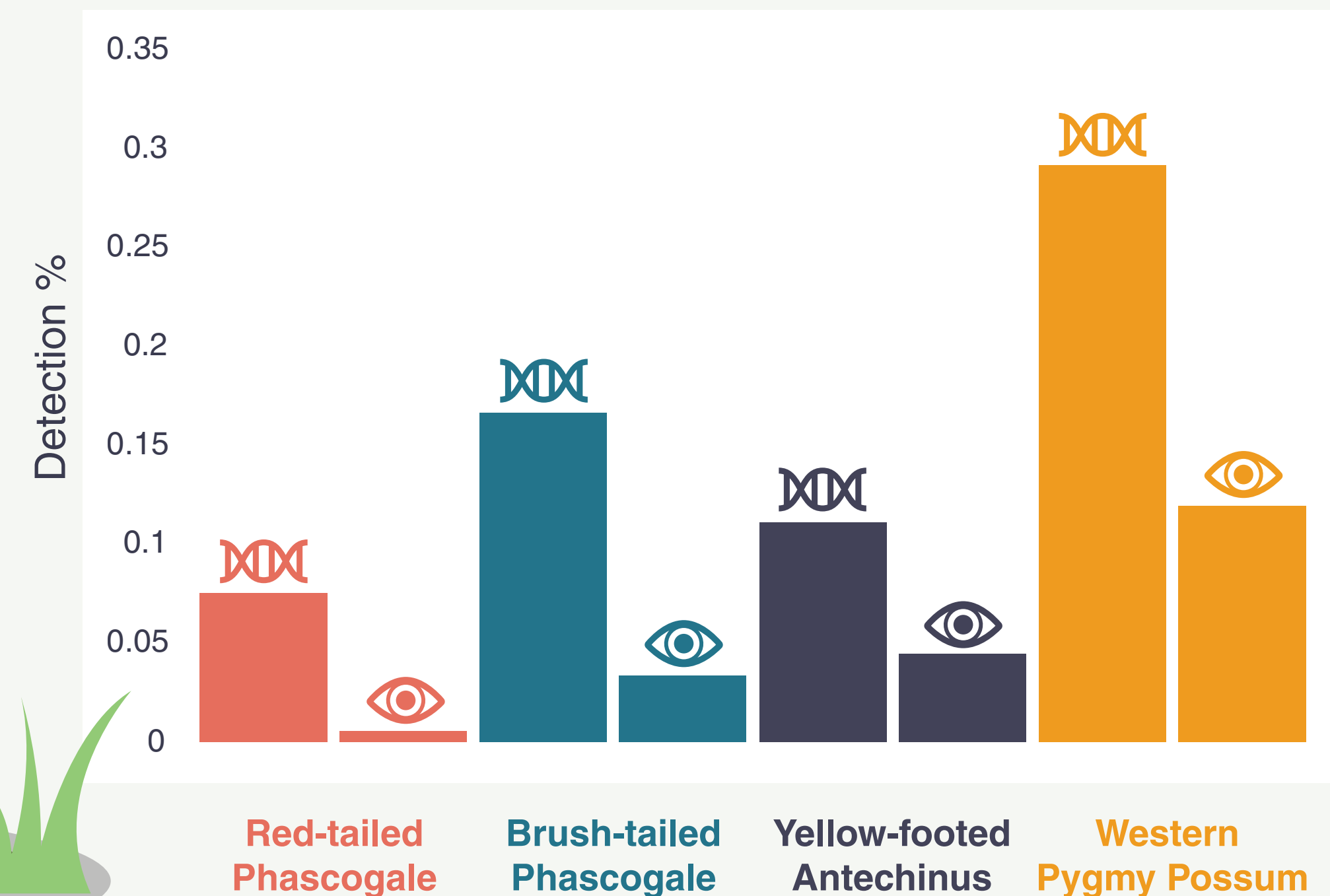


Figure 2. Detection percentage of arboreal marsupials in nest boxes with eDNA vs visual methods.

SUMMARY

- Nest box monitoring highlights species occupancy patterns
- eDNA captured more detections than visual survey methods
- Caution: eDNA persistence may lead to false positives

WHAT DOES A POSITIVE DETECTION ACTUALLY MEAN?

