

Targeted adaptive surveillance for exotic and emerging pathogens in feral pigs



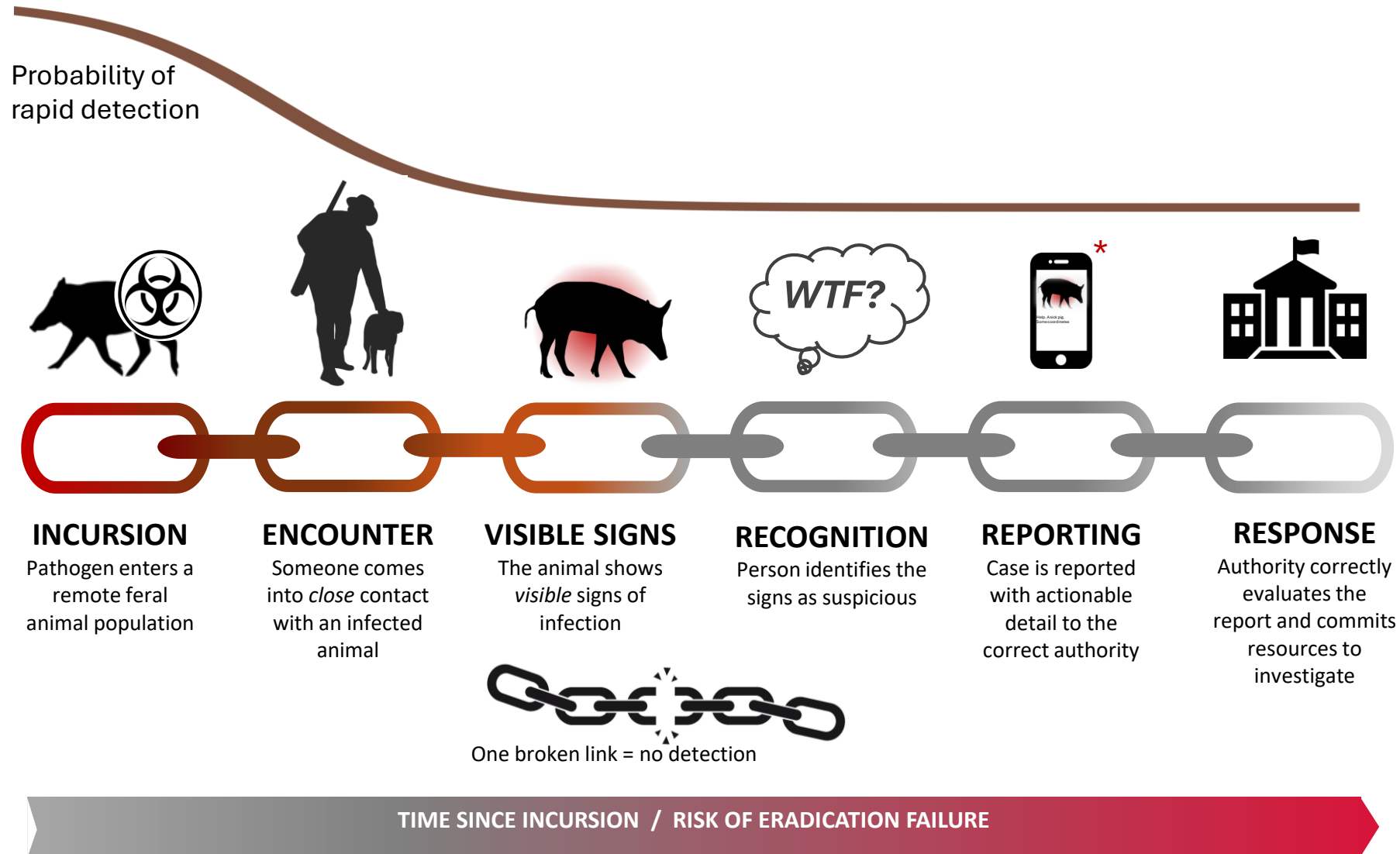
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Industries and Regional
Development



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Passive surveillance $\approx$ No surveillance



Why Feral Pigs?

High Risk Hosts

- Wide distribution
- High susceptibility
- Mix with livestock
- Amplifying hosts

Ideal indicator species



Risk-Based Spatial Framework

1. Six Risk Layers Combined

With deliberate simplicity

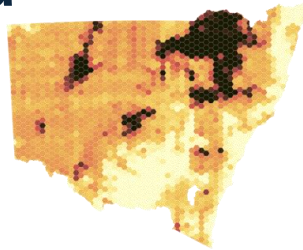
2. Risk Categories Defined

High, moderate, low, very low

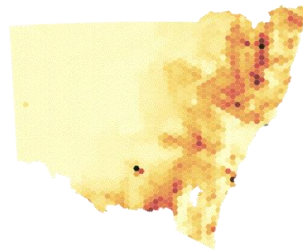
3. Sample Size Calculated

43 sites, 33 pigs each for
95% confidence

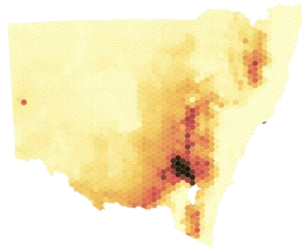
Feral pigs



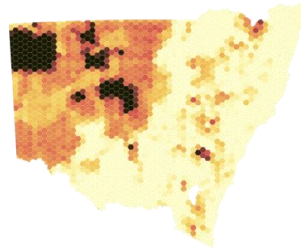
Cattle



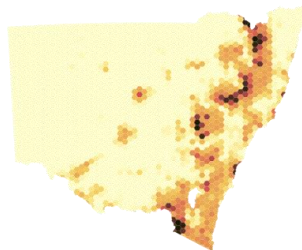
Sheep



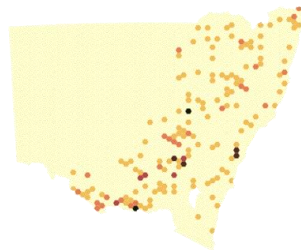
Feral goats



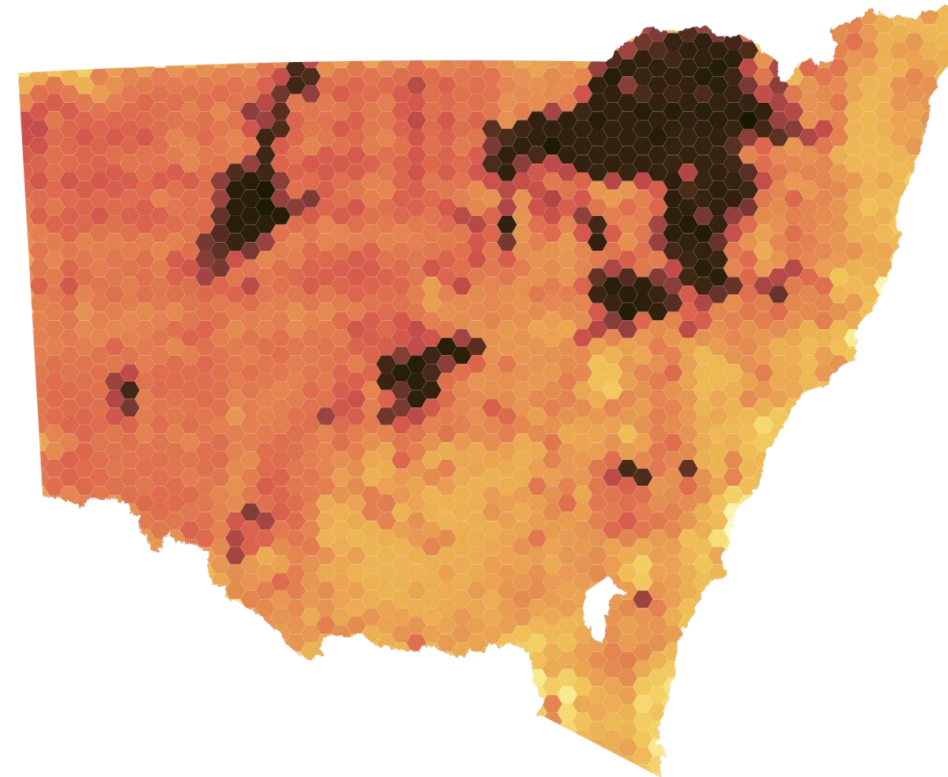
Wild deer



Point hazards



Total relative risk



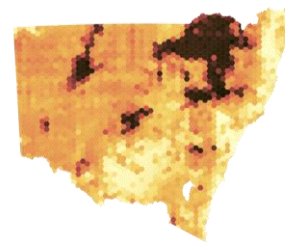
Low

High

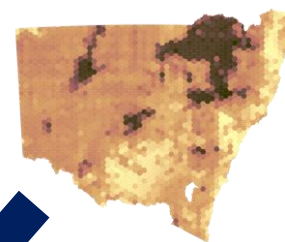
Adaptive Search Strategy



1) Map relative risk



2) Convert to search value



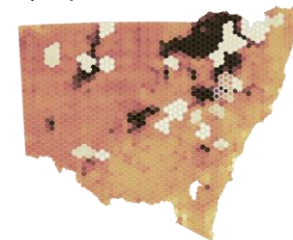
3a) Select high value dispersed cells



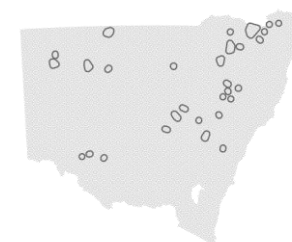
3b) Collect samples



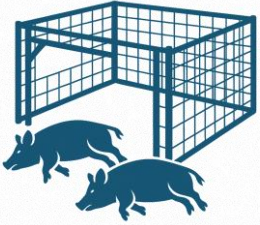
3d) Update search value



3c) Identify distribution and intensity of effort



Operational Results



95 sampling operations



1900 feral pigs sampled



67 sites

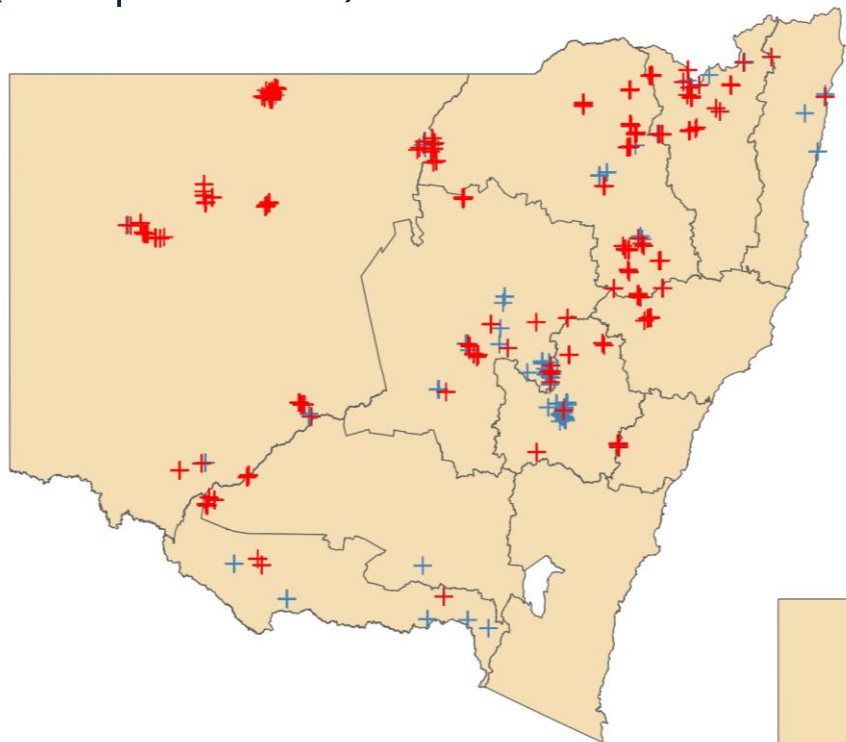


18000 lab tests



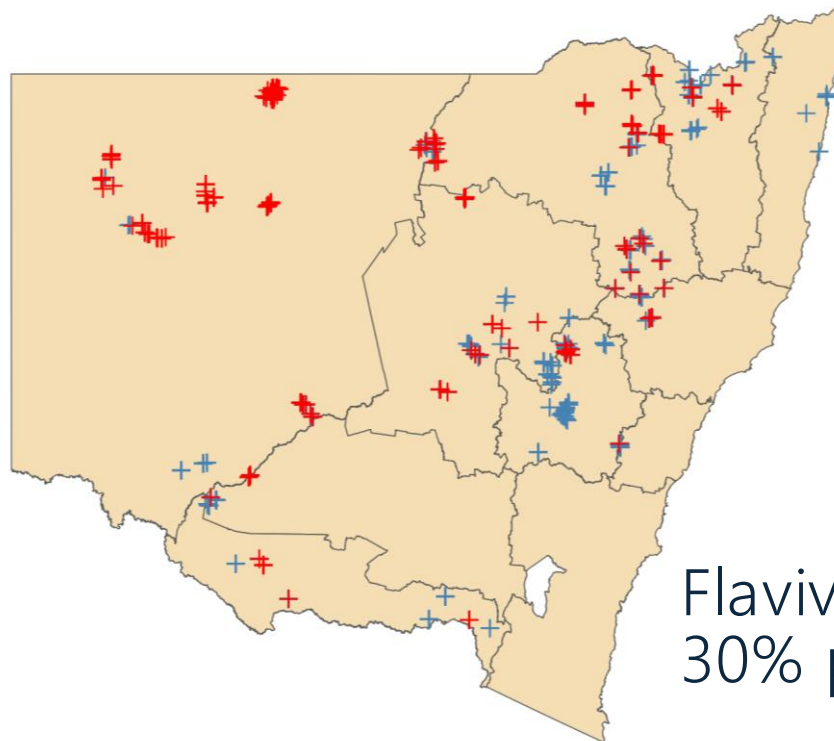
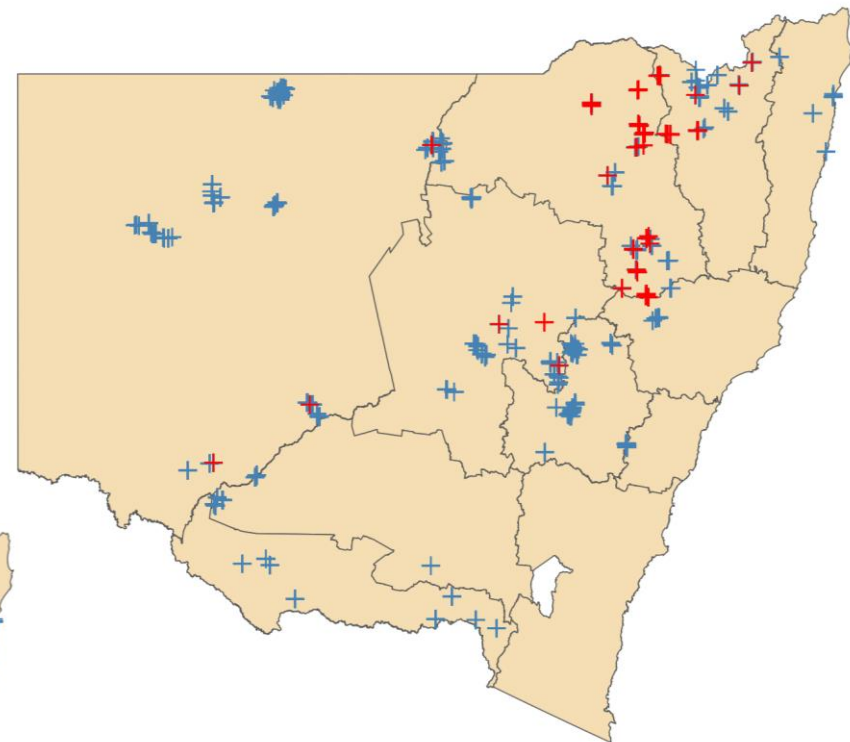
Leptospira
(ser pomona)

49% positive



Brucella suis

7% positive



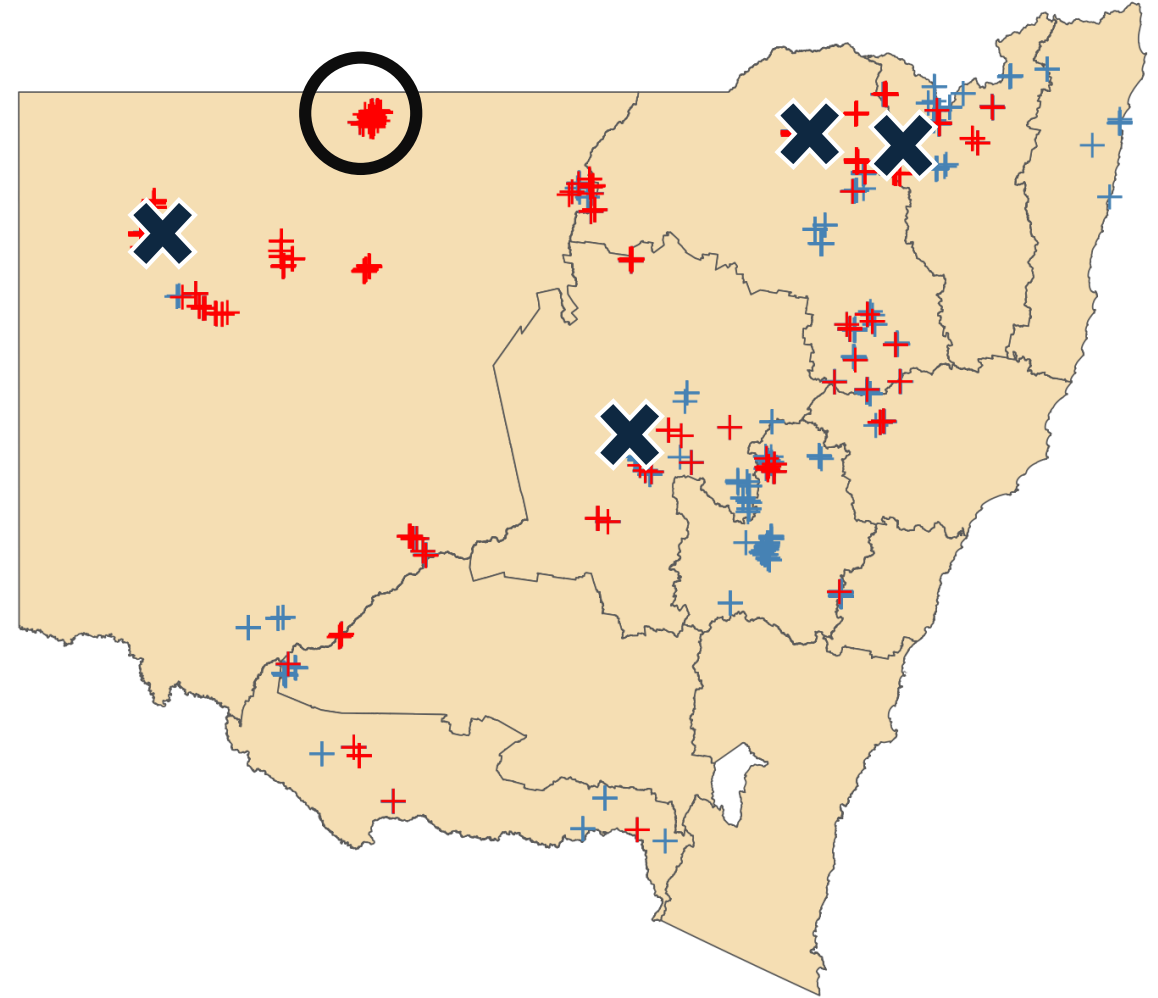
Flaviviruses (JEV)
30% positive

Real world validation: J E V Detection

Young pigs exposed after 2023 outbreak ended

15 infected feral pigs across four locations,
December 2024-February 2025

Before detection in humans and domestic animals



Real world validation: JEV Detection

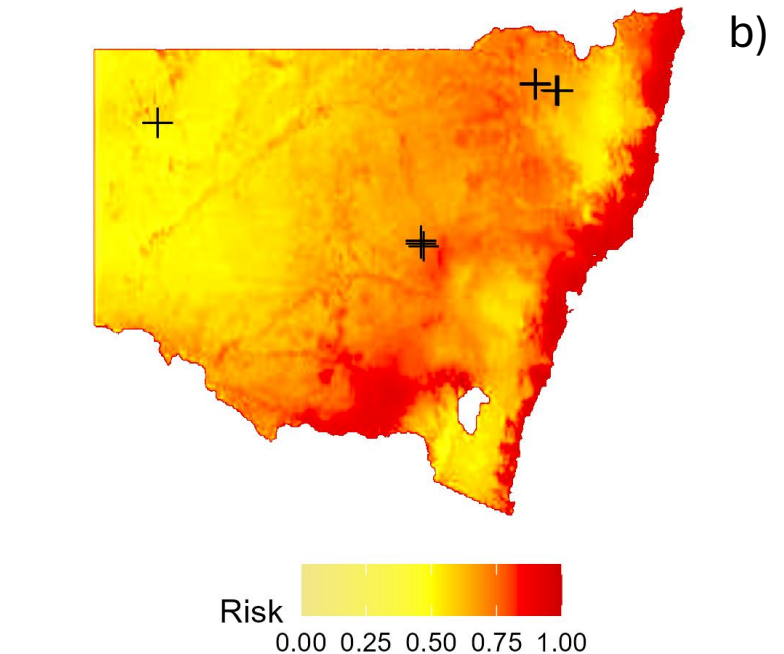
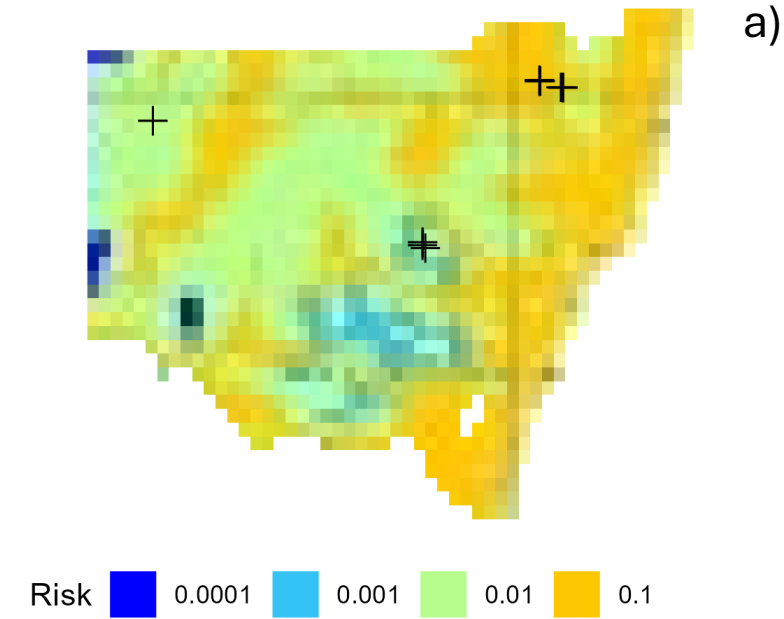
Young pigs exposed after 2023 outbreak ended

15 infected feral pigs across four locations,
December 2024-February 2025

Before detection in humans and domestic animals

None of the detections were in previous high-risk areas

Demonstrates the value of a wide-angle approach



Good surveillance:

- ✓ Proactive, risk-oriented protection against a wide range of threats -> Reduced response time
- ✓ Transparent decision making
- ✓ Integrated updating

Sustainability

