Australian Government
Department of Agriculture, Fisheries and Forestry

Australia's response to white spot disease outbreak

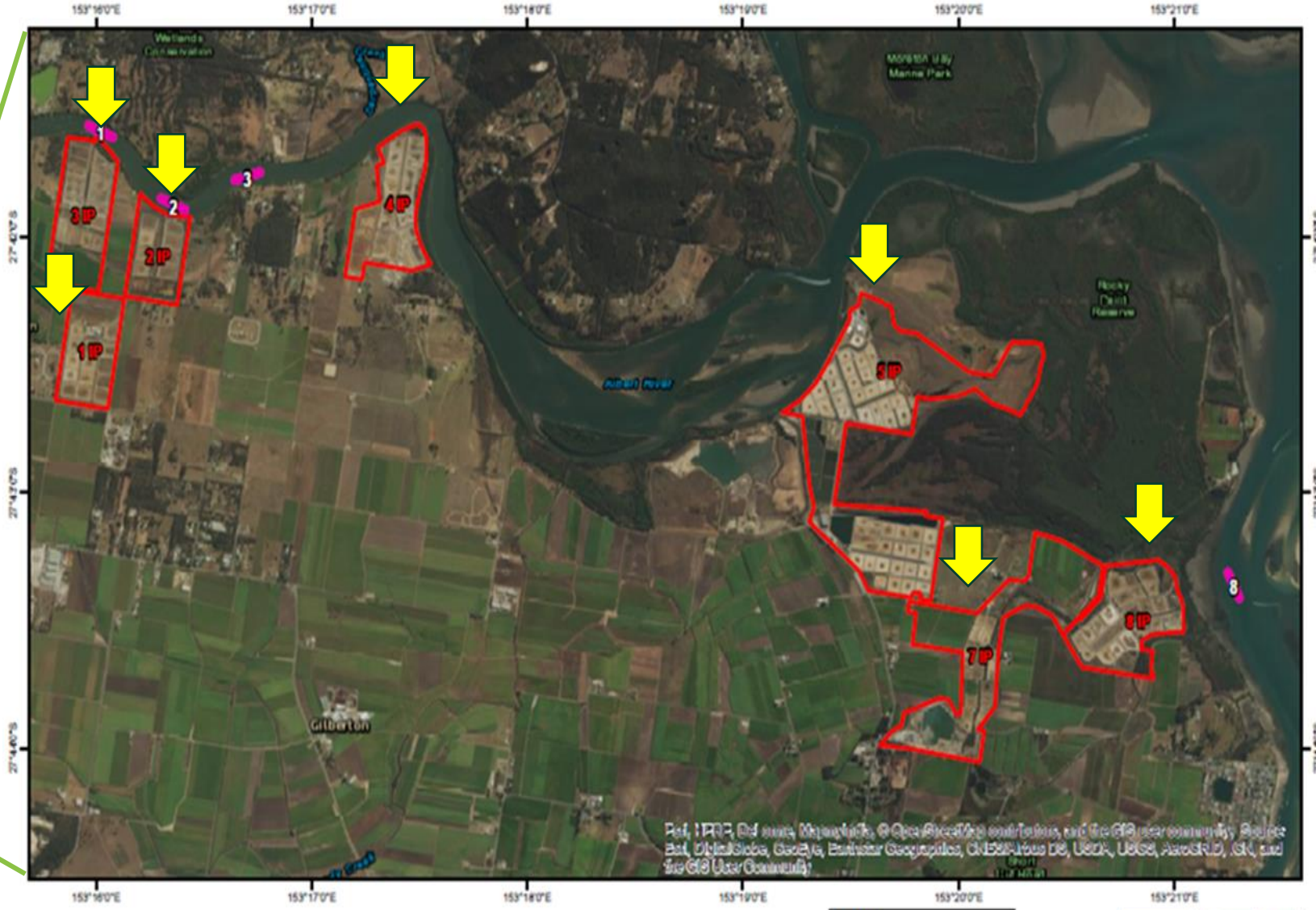
WOAH Regional workshop on Preparedness and Response for Emerging Diseases in Aquatic Animals for Asia and the Pacific, Singapore

Yuko Hood

29 October 2024

White spot disease outbreak in SE Qld

- Index case on 1 Dec 2016
- All 7 farms in the area were affected by Feb 2017



White spot disease outbreak in SE Qld

23 May 2017
Disposal and decontamination, discharge of water completed

31 May 2017 – 31 May 2018
All 7 Logan River prawn farms have laid fallow for 18 months

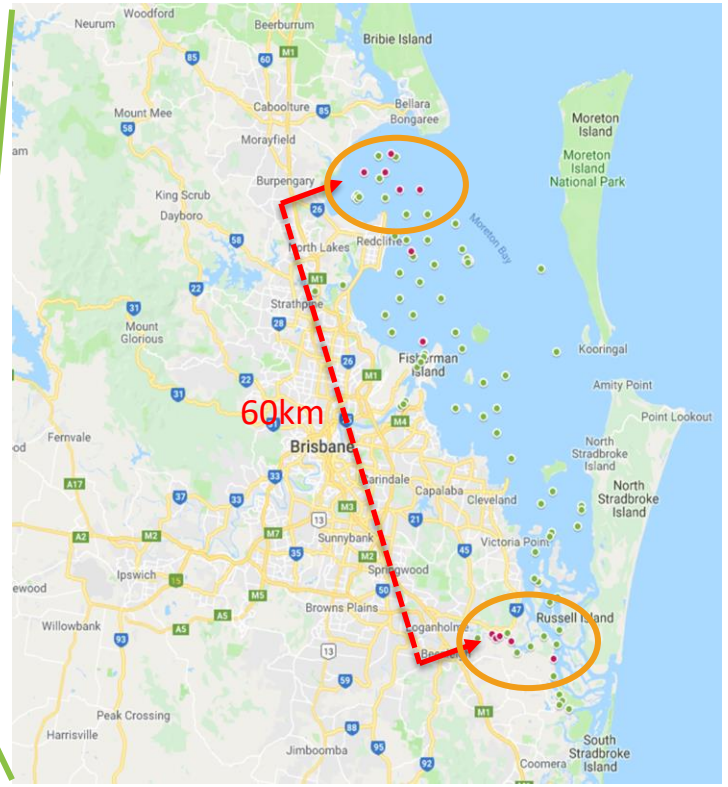

Gold Coast Bulletin 2018

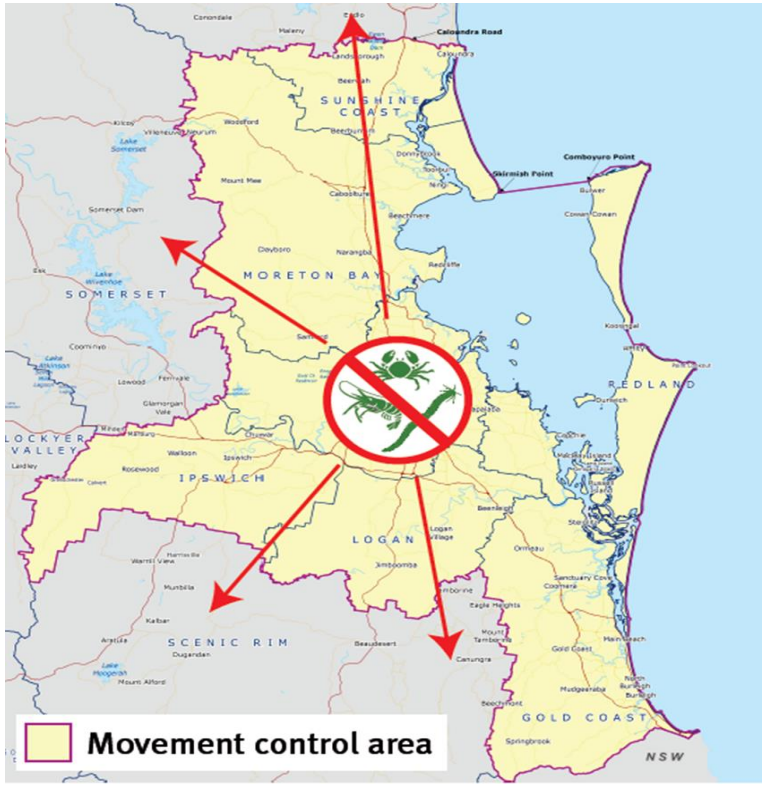

Redcity Bulletin 2018

White spot disease outbreak in SE Qld

7 March 2017
WSSV detected in the adjacent Moreton Bay

16 March 2017
Movement restrictions put in place to prevent the human-mediated spread of WSSV

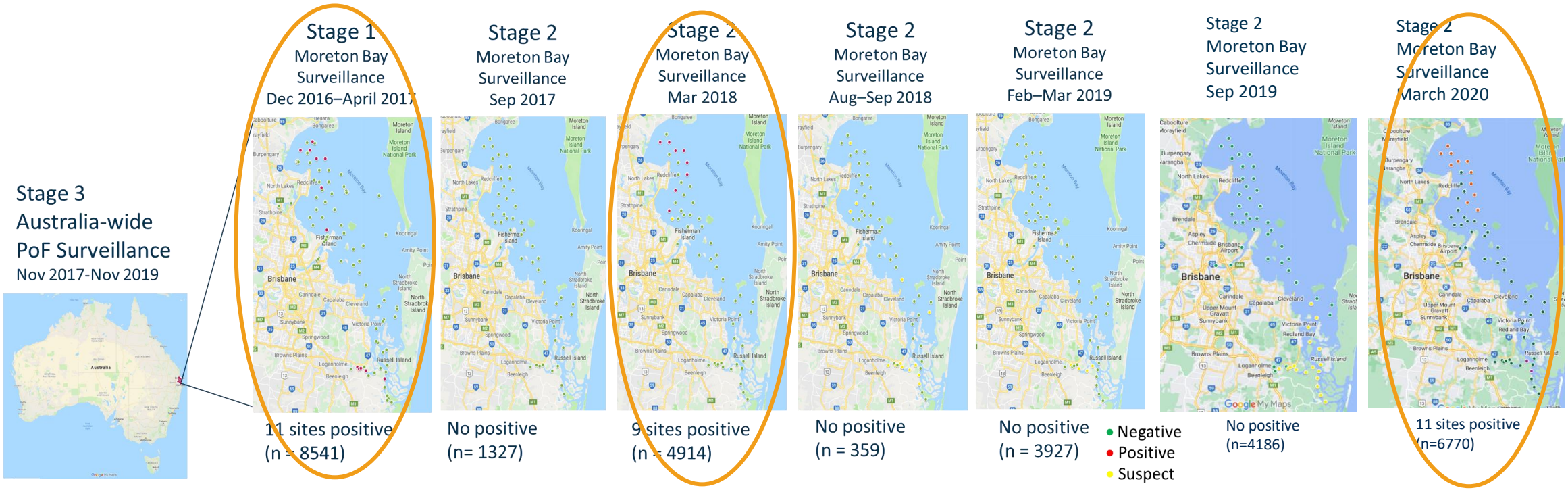




https://www.daf.qld.gov.au/business-priorities/animal-industries/animal-health-and-diseases/a-z-list/white-spot-disease/white-spot-surveillance

Demonstration of WSSV freedom (Delimitation surveillance)

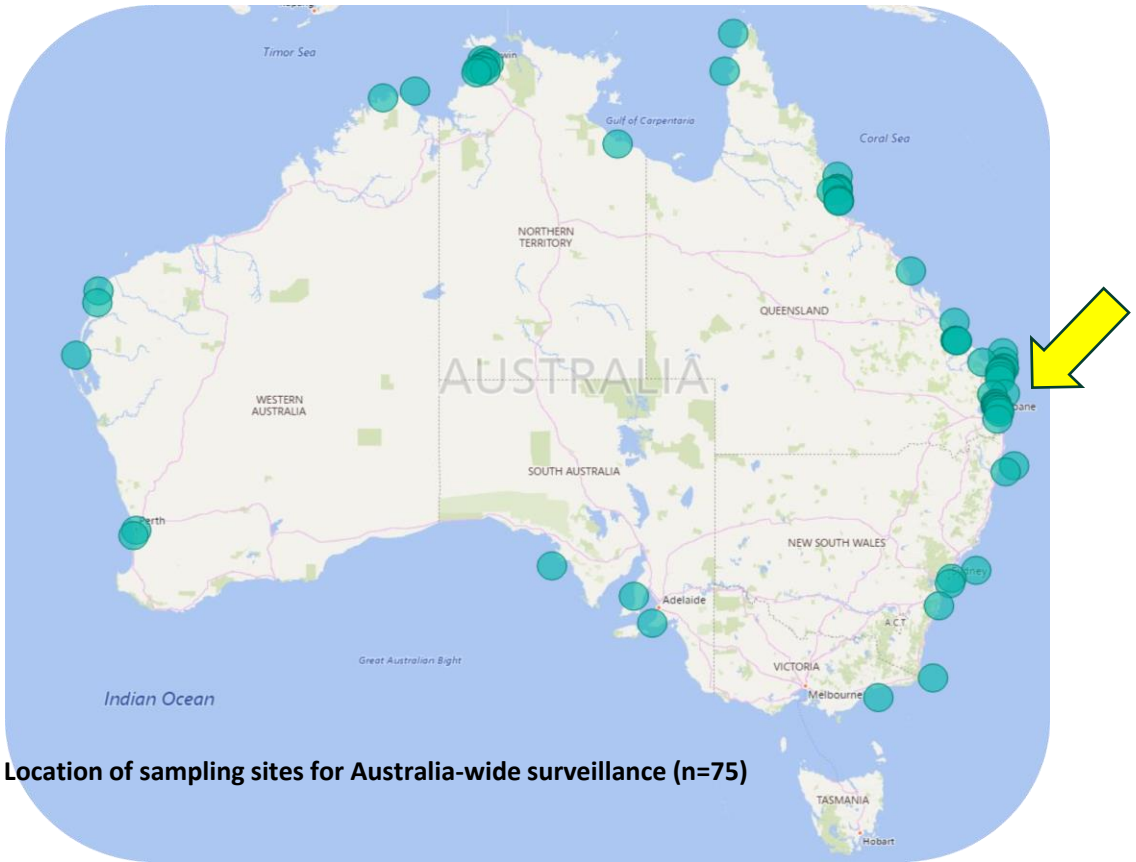
Stage 1: Understand the distribution of WSSV (targeted surveillance) 2016~
Stage 2: Determine if WSSV is established in the Movement Restricted Area (MRA) (targeted surveillance) 2016–2020
Stage 3: Demonstrate WSSV status in areas outside of MRA (targeted surveillance) 2017–2020
Stage 4: Provide quantitative surveillance sensitivity of WSSV freedom (using STM) 2023–2024



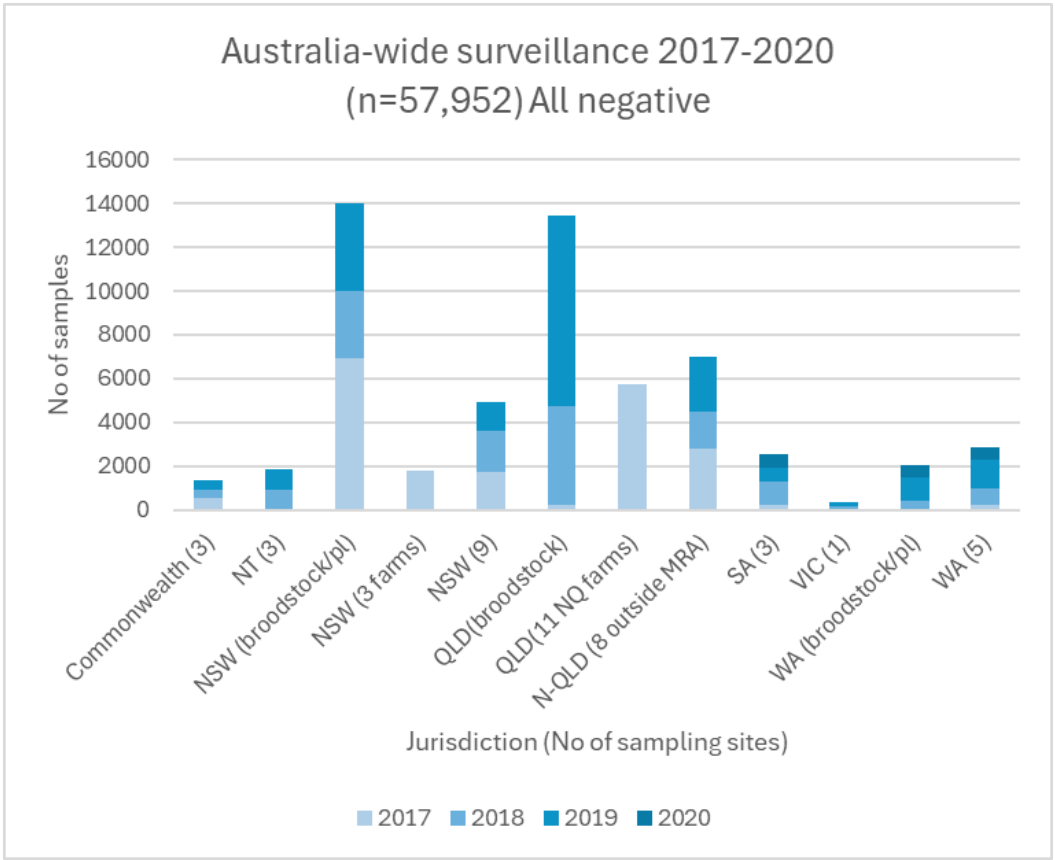
https://www.daf.qld.gov.au/business-priorities/animal-industries/animal-health-and-diseases/a-z-list/white-spot-disease/white-spot-surveillance (n=30,023)

Demonstration of WSSV freedom (Risk-based targeted surveillance)

Stage 1: Understand the distribution of WSSV (targeted surveillance) 2016~
Stage 2: Determine if WSSV is established in MRA (targeted surveillance) 2016–2020
Stage 3: Demonstrate WSSV status in areas outside of MRA (targeted surveillance) 2017–2020
Stage 4: Provide quantitative surveillance sensitivity of WSSV freedom (using STM) 2023–2024



Location of sampling sites for Australia-wide surveillance (n=75)



Demonstration of WSSV freedom (Risk-based targeted surveillance)

- ✓ Identify various **risk factors** and **target species** that may result in a higher probability of infection with WSSV in populations
- ✓ Risk factors to identify specific sampling sites around Australia (proximity to river systems; rec fish populations; seafood processing plants, ports, water temp 16–30C)
- ✓ the spatial coverage of the fisheries
- ✓ cost effectiveness and practicality
- ✓ the design prevalence, confidence, diagnostic sensitivity and specificity for surveillance of apparently healthy prawns

shutterstock.com

Diggles 2017

Sciencing 2017

Demonstration of WSSV freedom (Risk-based targeted surveillance)

Study populations	Wild crustacean populations captured during commercial prawn fisheries in Australia or sampling officers
Targeted populations	All farmed and wild crustaceans in Australia
Sampling biases	Sampled animals selected based on practicality of commercial trawl catches or sampling activities (not targeting high risk animals; ie sick animals)
Uncertainty and assumption	**Negative test results of the study populations support the case that targeted populations are free of WSSV**
Diagnostic methods	WOAH Taqman qPCR (Durand and Lightner 2002) CSIRO Taqman qPCR (Sritunyalucksana et al 2006)
Diagnostic Sp/Se	Sp: 0.9999 Se: 0.768 (CI 0.689-0.849)(WOAH) 0.829 (CI 0.75-0.902)(CSIRO) for clinically healthy animals (Moody et al 2022)
Design prevalence	0.02
No of samples per site	177 (CSIRO) –191 (WOAH)

Demonstration of WSSV freedom (WOAH Code)

Article 9.9.6. (Self-declaration of zone freedom from infection with WSSV)

Point 4. It (the country) previously made a self-declaration of freedom for a zone from infection with WSSV and subsequently lost its free status due to the detection of WSSV in the zone but the following conditions have been met:

a. on detection of WSSV, the affected area was declared **an infected zone and a protection zone** was established; and
b. infected populations within the infected zone have been **killed and disposed of** by means that minimise the likelihood of further transmission of WSSV, and the appropriate **disinfection** procedures (as described in Chapter 4.4.) have been completed followed by **fallowing** as described in Chapter 4.7.; and
c. previously existing **basic biosecurity conditions** have been reviewed and **modified** as necessary and have continuously been in place since eradication of infection with WSSV; and
d. targeted surveillance, as described in Chapter 1.4., has been in place for at least the last **two years without detection of WSSV**.

Pathways of demonstrating freedom (WOAH Code; Chapter 1.4.)

Pathway	Primary evidence	Secondary evidence	Areas
1. Absence of susceptible species	Surveys of species, historical data, import records, env info	None	Country, zone
2. Historical freedom	Passive surveillance	Targeted surveillance (if passive surveillance is not appropriate)	Country, zone
3. Targeted surveillance	Targeted surveillance	Passive surveillance	Country, zone, compartment
4. Returning to freedom	Targeted surveillance	Passive surveillance	Country, zone, compartment

- ✓ **Pathway 4 – Returning to freedom (Article 1.4.14.)**
- ✓ **Sensitivity of an early detection system/passive surveillance system (Article 1.4.7.)**
- ✓ **Combining multiple sources of information using STM (Article 1.4.17.)**

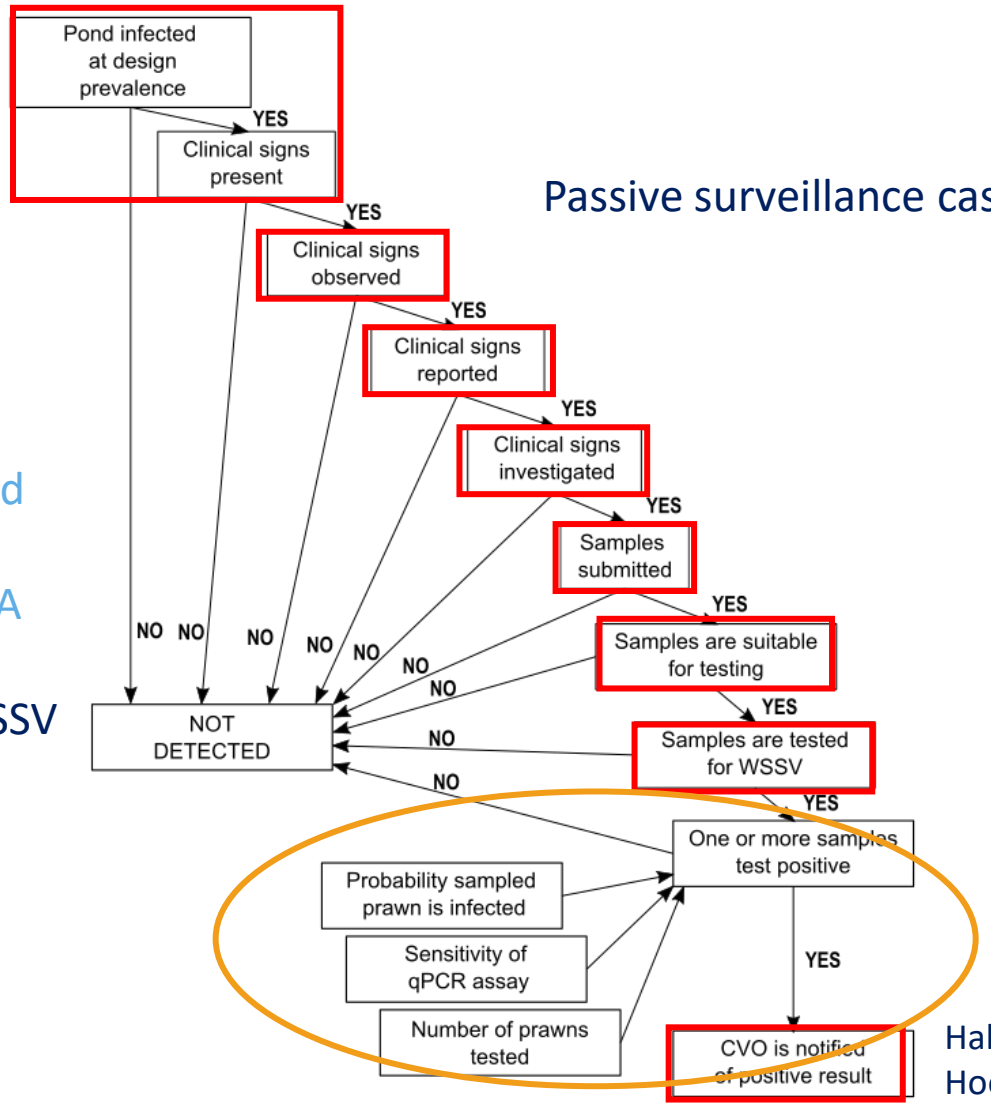
Pathways of demonstrating freedom (WOAH Code; Chapter 1.4.)

Stage 1: Understand the distribution of WSSV (targeted surveillance) 2016~

Stage 2: Determine if WSSV is established in MRA (targeted surveillance) 2016–2020

Stage 3: Demonstrate WSSV status in areas outside of MRA (targeted surveillance) 2017–2020

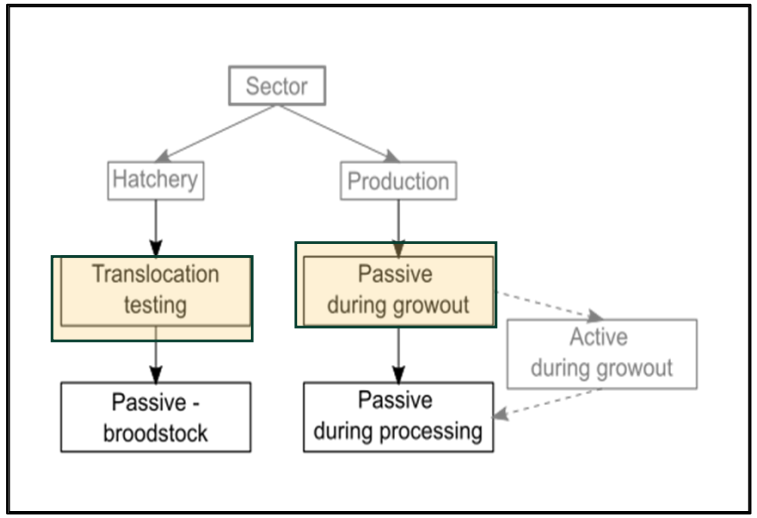
Stage 4: Provide quantitative surveillance sensitivity of WSSV freedom (using Scenario Tree Modelling) 2023–2024

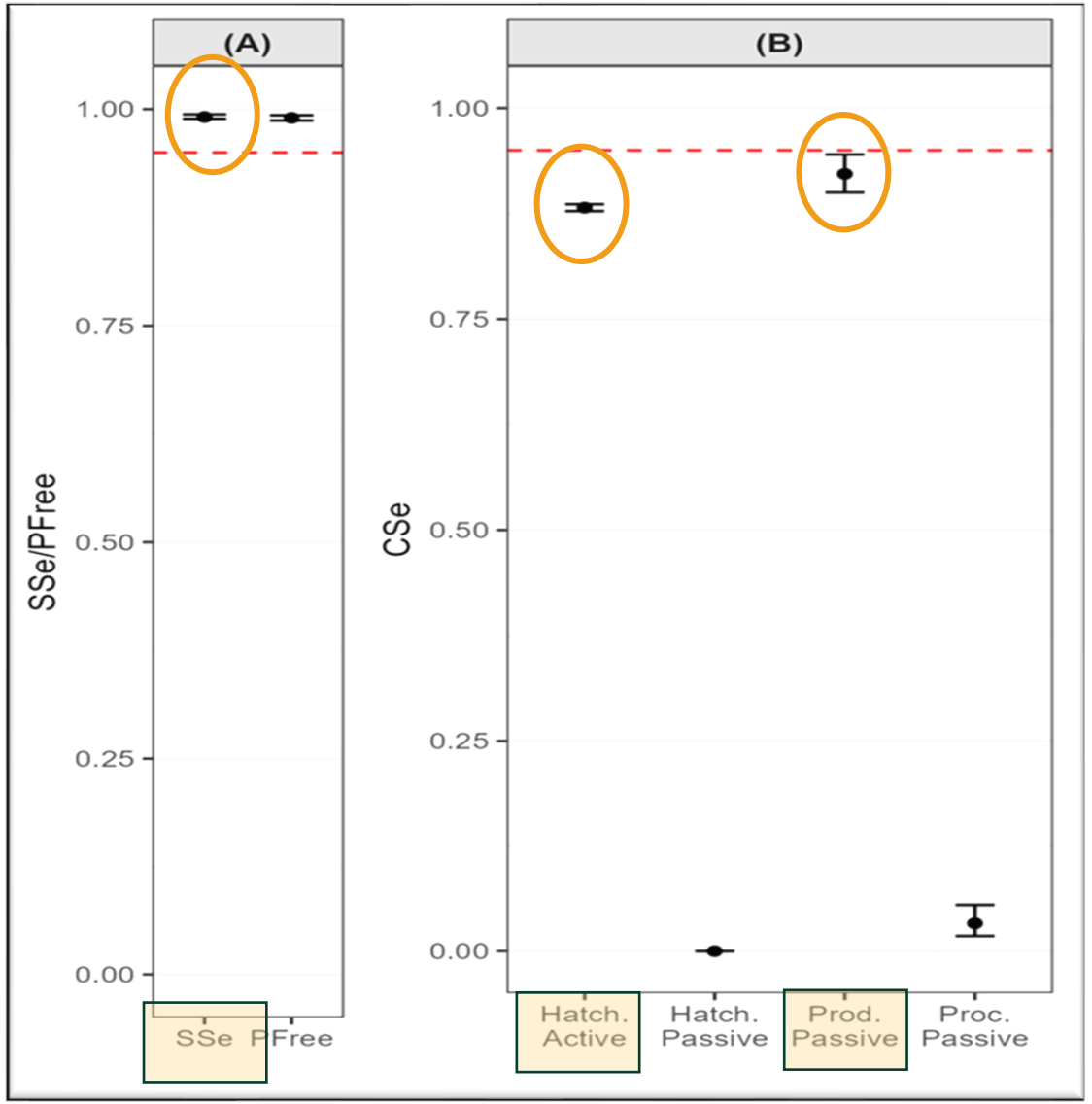


Passive surveillance cascade

Hall, Cowled, Hood (*in prep*)

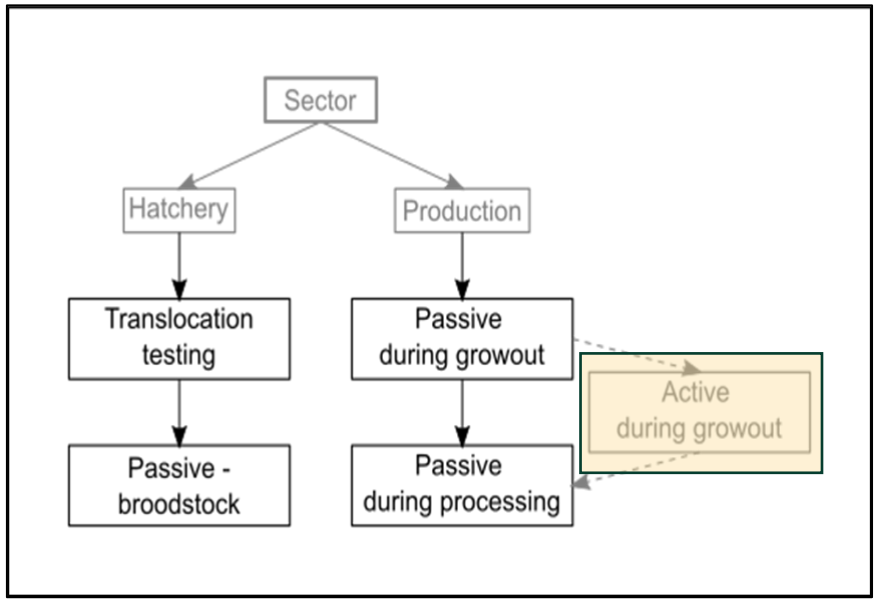
Freedom surveillance sensitivity

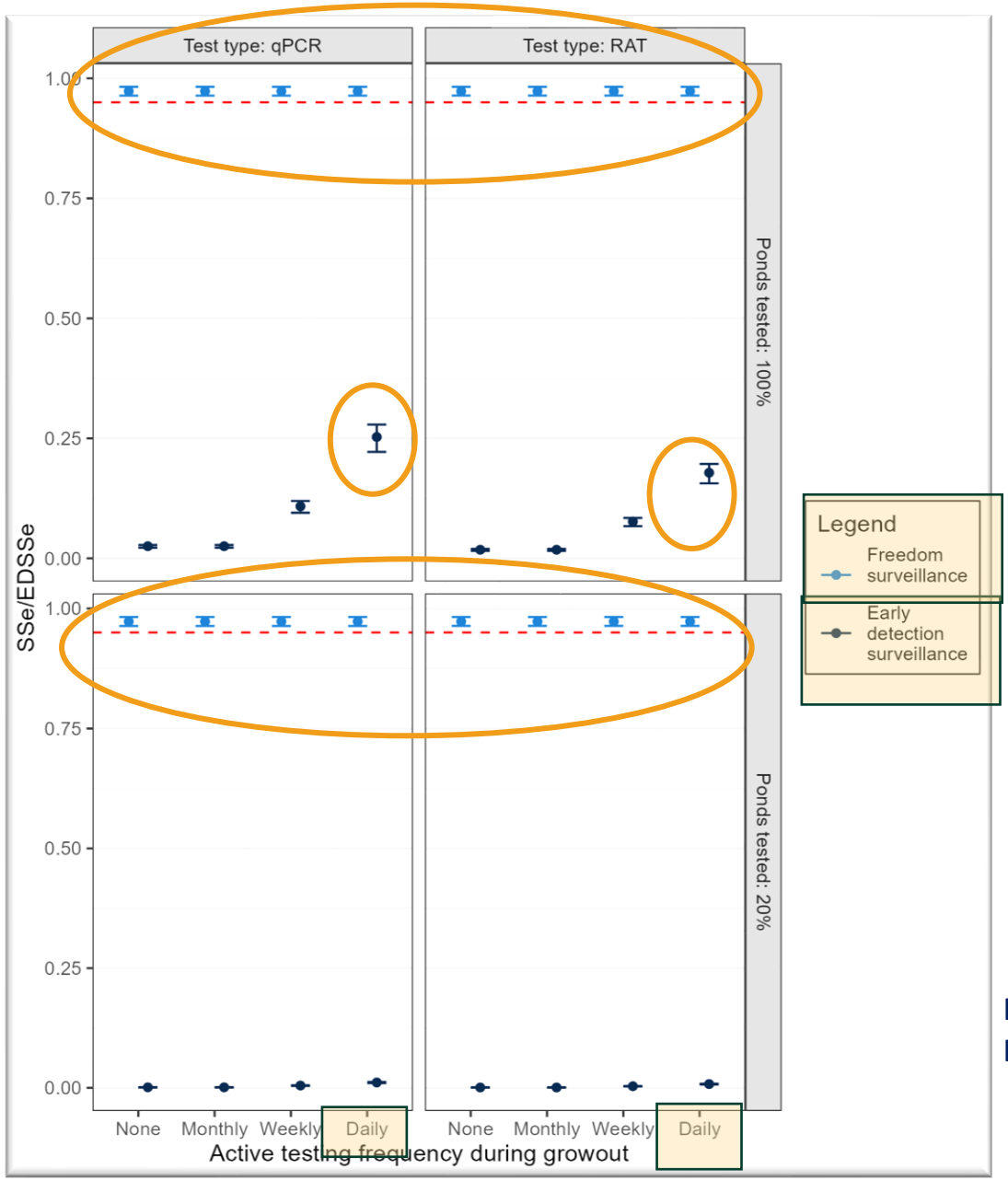




Hall, Cowled, Hood (*in prep*)

What-if scenario: Active testing during grow out





Hall, Cowled, Hood (*in prep*)

Conclusion

- ✓ Australia’s response to WSD involved a comprehensive national response, including movement controls, disposal of infected stock, fallowing, and surveillance.
- ✓ We conducted delimitation and national surveillance of wild populations to understand WSSV distribution. Given recent NSW detections, ongoing surveillance is in place.
- ✓ Australian prawn farms affected by white spot eradicated the virus in farmed prawn populations.
- ✓ Our ongoing surveillance system demonstrates high sensitivity (over 99%) and strong confidence in WSSV freedom in farmed populations.
- ✓ Australia’s aquatic health authorities meet international standards of evidence, working to restore freedom in alignment with WOAH guidelines.
- ✓ These efforts are the result of nationally coordinated collaborations between federal, state governments, and industries.