ANIMAL HEALTH IN AUSTRALIA

Annual Report 2019–2020

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Please find a digital copy of the *Animal Health in Australia Annual Report 2019–2020*, as well as previous editions, at www.animalhealthaustralia.com.au/ahia.

FOREWORD

Welcome to the first *Animal Health in Australia (AHiA) Annual Report*, which outlines animal health and related matters that have arisen during the past year, including relevant new policies and disease incidents. This first edition covers 2019 and 2020, with later editions to be published annually. The *AHiA Annual Report* is distinct from the *AHiA System Report*, which was first published in April 2021 and describes Australia's national animal health system and the governance, surveillance, emergency management and animal welfare arrangements that support our unique animal health status.

Both the AHiA System and Annual reports are available from Animal Health Australia's website: www.animalhealthaustralia.com.au

As we all know, 2020 has been a challenging year, from the Black Summer bushfires, to the COVID-19 pandemic, the incursions of avian influenza in Victoria, and the spread of some significant animal diseases such as African swine fever, lumpy skin disease and African horse sickness within our region. What has also been an ongoing theme, and continues to inspire me, is the excellent work of our animal health communities. The events of 2020 demonstrated just how wide-ranging and crucial the animal health sector, and its outputs, are – and how we can rise to face challenges.

When I was elected as President of the World Organisation for Animal Health (OIE) in 2018 I was aware of many issues that would be key challenges facing the organisation during my term as President. COVID-19 has been the most significant challenge that has shaped 2020 and will continue to influence the work and operations of the OIE and veterinary services globally into the future.

This year has highlighted the severe threats posed by emerging diseases and pressures on our ecosystems – threats which if left unaddressed will likely only increase.

Australia has been at the forefront of efforts to put in place international frameworks and systems to identify risks associated with and, where necessary, reform human interactions with wildlife to reduce the risk of the emergence of future pandemics.

From my perspective, a successful future would necessarily be one in which there is strong collaboration to support good health outcomes. There is recognition of the value of diversity of expertise and experience, along with the need to work together, with active connections and productive interactions. This includes between the animal health communities across Australia and abroad; and between the animal, human and environmental health sectors. It also extends beyond this to our use of science, data and technologies – to continually update our knowledge and approaches in readiness not only for the known, but also the unknown.

Animal health systems should support science- and evidence-based decisions, and be characterised by leadership, foresight, responsiveness, innovation, resilience, professionalism, commitment and collaboration. As Australia's Chief Veterinary Officer, I am privileged to be exposed to the vast and valuable activities that comprise our animal health system, and every day I witness these attributes in practice.

As reflected in this report, our animal health system is a product of the input and dedication of many. Thank you to all who contributed to the development of this report, and of course the many who work to support animal health in Australia.

Mark Schipp
Australian Chief Veterinary Officer
President, OIE World Assembly of Delegates

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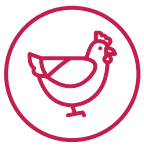
Key achievements

Animal health status and emergency responses

Maintenance of animal disease freedom

Through 2019 and 2020, Australia maintained freedom from many significant animal diseases, including those on the World Organisation for Animal Health (OIE) list of official diseases. Further information about Australia's terrestrial and aquatic animal health status is in Chapters 2 and 3.

Learn more: www.oie.int/en/animal-health-in-the-world/official-disease-status



Avian influenza response in Victoria

Australia successfully eradicated outbreaks of three avian influenza (AI) strains from six poultry farms in Victoria and regained freedom from high pathogenicity avian influenza, amid challenging conditions presented by the COVID-19 pandemic.

Learn more: www.outbreak.gov.au/current-responses-to-outbreaks/avian-influenza

African swine fever projects

Australia progressed a series of projects to improve national African swine fever (ASF) preparedness and response arrangements, including increasing border interventions at international airports and mail centres, targeted communication activities, conducting ASF simulation exercises (Exercise Razorback), developing an ASF zoning arrangement with Singapore and supporting Timor-Leste and Papua New Guinea's responses to ASF incursions.

Learn more: www.agriculture.gov.au/pests-diseases-weeds/animal/asf

Contingency planning for emergency animal diseases

Through 2019 and 2020, 14 AUSVETPLAN disease response strategies, six AUSVETPLAN guidance documents and five AUSVETPLAN resource documents, one operational manual and one overview document were revised and published. Three AQUAVETPLAN manuals were revised and published.

AUSVETPLAN: www.animalhealthaustralia.com.au/ausvetplan
AQUAVETPLAN: www.agriculture.gov.au/animal/aquatic/aquavetplan

Disaster responses

Through 2019 and 2020, bushfires and floods presented significant challenges to Australia's livestock industries. Emergency responses to these natural disasters, mounted in collaboration between industry, government agencies and private veterinarians, will help ensure that the terrestrial animal sector remains resilient and productive beyond 2020. Government and industry animal health officers also provided significant assistance to the human health sector in response to COVID-19.

Bushfires: www.agriculture.gov.au/ag-farm-food/bushfires
Floods: www.droughtandflood.gov.au

Point-of-care testing

Victoria developed a point-of-care testing platform that enables rapid diagnostic testing for ASF. Further point-of-care testing platforms are being developed for foot-and-mouth disease and classical swine fever, to support national response efforts where required.

Learn more: www.csiro.au/en/Research/Health/Infectious-diseases-coronavirus

National animal health initiatives

AQUAPLAN

AQUAPLAN 2014–2019 concluded in 2019. In 2020, the fourth AQUAPLAN was being developed to strengthen Australia's national aquatic animal health system. Progress on the new AQUAPLAN will be captured in future Animal Health in Australia annual reports and on the Department of Agriculture, Water and the Environment website.

Learn more: www.agriculture.gov.au/animal/aquatic/aquaplan

AnimalPLAN

Using the model of AQUAPLAN, the first AnimalPLAN was developed in 2020. AnimalPLAN consists of an agreed list of priorities to strengthen Australia's national terrestrial animal health system and support the National Farmers' Federation's '$100 billion by 2030' goal.

Learn more: www.awe.gov.au/animal-plan

Agricultural Competitiveness White Paper

$200 million was invested in Australia's biosecurity system from the Agricultural Competitiveness White Paper. The animal-health-related white paper projects:

- strengthened Australia's animal health surveillance capacity and capability to show freedom from pests and diseases;
- improved community-based biosecurity activities;
- improved Australia's scientific capability; and
- improved Australia's ability to collect, store, analyse and share biosecurity information for interpretation and analysis.

Learn more: www.awe.gov.au/white-paper-projects

Australia's National Antimicrobial Resistance Strategy: 2020 and Beyond

Australia's National Antimicrobial Resistance Strategy: 2020 and Beyond was published in March 2020 and sets out a 20-year vision to protect the health of humans, animals and the environment through minimising the development and spread of antimicrobial resistance.

Learn more: www.awe.gov.au/news/stay-informed/communiques/ag-ministers-forum-october-2019

Salmonella Enteritidis management

Through extensive stakeholder consultation, Australia has developed a multi-sectoral *National Salmonella Enteritidis Response Management Plan* in response to the 2018–19 *Salmonella* Enteritidis (SE) incident in New South Wales and Victoria. The plan aims to prevent locally acquired SE in people by detecting it early, rapidly communicating to stakeholders, reducing transmission from infected premises, assuring elimination of the agent, and consistent response mechanisms.

Learn more: www.animalhealthaustralia.com.au/national-salmonella-enteritidis-response-management-plan

Animal welfare standards

Management of heat stress in sheep exports

Since the introduction of animal welfare regulatory changes, developed in collaboration between the Department of Agriculture, Water and the Environment and the livestock export industry to manage heat stress in live sheep exported to the Middle East, there has been a near-80% reduction in sheep mortality in 2019 compared to 2013–2018, as calculated during the northern hemisphere summer period.

Learn more: www.agriculture.gov.au/export/controlled-goods/live-animals/livestock/history/review-northern-summer

Updated *Australian Standards for the Export of Livestock* (ASEL 3.0)

Following extensive consultation with stakeholders, including an independent technical advisory committee of experts, the updated *Australian Standards for the Export of Livestock* (ASEL 3.0) commenced on 1 November 2020, and will help improve the health and welfare status of animals throughout a sea or air voyage.

Learn more: www.agriculture.gov.au/export/controlled-goods/live-animals/livestock/australian-standards-livestock

Industry standards and guidelines for goats

Through 2019 and 2020, the Goat Industry Council of Australia (GICA), in collaboration with Animal Health Australia, developed and updated the *Australian Industry Welfare Standards and Guidelines for Goats*, a voluntary tool to facilitate industry uptake of best-practice animal welfare, improve production and maintain market access. This includes an animal welfare policy statement adopted by GICA.

Learn more: www.animalwelfarestandards.net.au/files/2015/07/Australia-Industry-Standards-and-Guidelines-for-Goats.pdf

Industry-led projects

Pig industry traceability – PigPass

The PigPass mobile app was rolled out in 2019. This application will increase the quality and accuracy of pig traceability data collected by the PigPass system, and increase the efficiency of emergency animal disease responses.

Since February 2018, state and territory governments have been progressively introducing mandatory reporting of all pig movements to the PigPass database. Four states have legislated these changes, while remaining states have made progress toward legislation. There is also excellent industry uptake of these requirements under voluntary arrangements.

Learn more: https://pigpass.australianpork.com.au/faq

Dairy welfare improvements

The Australian dairy industry has committed to phase out calving induction by 1 January 2022. To meet this goal, the industry has progressively reduced its use of induction.

Australian dairy farmers can now also select sires for improved welfare outcomes, with new Australian breeding values available for traits of genomic calving ease and short gestation length.

Learn more: www.dairyaustralia.com.au

Farm biosecurity plan adoption in the beef industry

In 2020, the percentage of Australian cattle properties covered by a documented biosecurity plan increased to 90%, up from 25% in 2019.

Learn more: www.sustainableaustralianbeef.com.au/58330/widgets/299243/documents/172464

Implementation of a *National Sheep Industry Biosecurity Strategy*

In 2019 and 2020, Australia's sheep industry developed and began implementing the *National Sheep Industry Biosecurity Strategy*, which includes two extension officers to deliver its key activities across multiple jurisdictions and improve biosecurity culture across the Australian sheep industry.

Learn more: www.animalhealthaustralia.com.au/what-we-do/biosecurity-services/national-sheep-industry-biosecurity-strategy

Poultry welfare and biosecurity improvements

In 2020, the chicken meat industry developed guidelines to minimise the risks of potential production system closures and to ensure adequate monitoring of animal welfare during significant business disruptions such as the COVID-19 outbreak. A new training program was also developed to deliver 'effective stunning and slaughter of poultry' training across processing plants in Australia to improve poultry welfare outcomes.

In May 2020, the industry's new *National Farm Biosecurity Manual for Chicken Growers* was published by the Australian Chicken Meat Federation. Compliance with the manual is required for chicken growers under contractual arrangements with the chicken-processing companies they supply.

Learn more: www.chicken.org.au/industry-resources/#Biosecurity_Manual_for_Chicken_Growers_May_2020

Trade

Free trade agreements

The Australian Government is negotiating free trade agreements (FTAs) with the European Union and the United Kingdom, and a new Indonesia–Australia Comprehensive Economic Partnership Agreement, to deliver expanded market access while complementing our high standards for biosecurity, animal health and welfare.

Learn more: www.agriculture.gov.au/market-access-trade/fta

Export market access

The Department of Agriculture, Water and the Environment continued its efforts to minimise the impacts of disease incidents on trade. Following detections of OIE-listed diseases including AI and clinical bluetongue virus (BTV), the Department of Agriculture, Water and the Environment worked closely with Commonwealth, state and territory animal health authorities, international trading partners and affected industries and exporters to allow safe trade in meat and animal products to continue where possible.

As of January 2021, the Department of Agriculture, Water and the Environment had successfully renegotiated trade to 34 countries for various poultry meat and poultry products affected by AI.

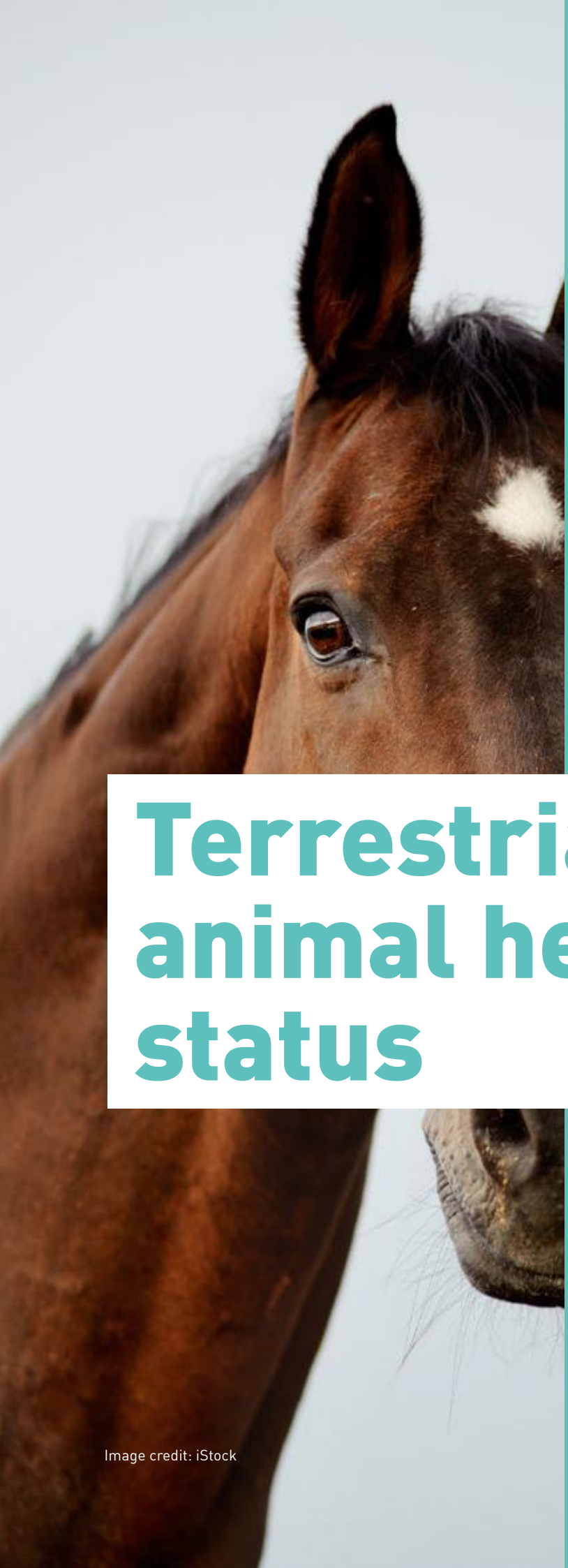
Over 2019 and 2020, new market access was achieved for breeding buffalo to Japan, breeding sheep to India, alpaca to Hong Kong, goat semen to Vanuatu, bovine embryos to Paraguay and bovine semen to Guatemala. Improved market access was achieved for slaughter sheep to Saudi Arabia, breeder cattle to Japan, sheep and goat semen to Peru, and sheep and goat semen and embryos to the United States.

Learn more: www.agriculture.gov.au/market-access-trade/agricultural-trade-matters/achievements

Imports of animals and animal products

The Department of Agriculture, Water and the Environment progressed biosecurity import risk assessments (BIRAs) in response to market access requests from other countries and proposals from Australian importers to import commodities. A biosecurity risk review was completed for cooked duck meat from Thailand and progress was made on risk reviews for prawns and prawn products for human consumption, psittacine birds (household pet and aviary), natural sausage casings and zoo bovids and their semen, among others. Import conditions are being reviewed for the risk species list for non-salmonid marine finfish for human consumption or baitfish, and were amended for canine influenza virus for dogs and salmonid products. Horse imports from Hong Kong Special Administrative Region resumed following suspension in 2017, and an assessment of high pressure processing as an alternative risk management measure for chicken meat was also completed. The department facilitated the importation of ferrets to support vaccine research for COVID-19 and an assessment of biosecurity risks of hamsters is underway for biomedical research related to COVID-19.

Learn more: www.agriculture.gov.au/biosecurity/risk-analysis/animal



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2

Terrestrial animal health status

Australia has a long history of freedom from the major epidemic diseases of livestock. The geographical isolation of the continent provides a natural biosecurity barrier, which is supported by sound biosecurity policies and a history of successful disease eradication campaigns.

The spread of some endemic diseases of animals in Australia is limited by climate and the type of animal production enterprises present in an area. Tick fever, for example, occurs only in parts of northern Australia where the climate is suitable for tick vectors. State and territory governments manage the control and eradication of animal diseases, often with the support of industry accreditation schemes.

This chapter provides information about Australia's status for all nationally significant terrestrial animal diseases.

2.1 Status of terrestrial animal health in Australia

Australia provides the World Organisation for Animal Health (OIE) with information about OIE-listed diseases through reports every six months.[1] Table 2.1 shows Australia's status for OIE-listed diseases in 2020.

Table 2.1 Australia's status for OIE listed diseases* of terrestrial animals, 2020

Infection/Disease	Status	Date of last occurrence and notes
Multiple species disease		
Anthrax	Present	Limited distribution (see Figure 2.8)
Crimean Congo haemorrhagic fever	Free	Never occurred
Equine encephalomyelitis (eastern)	Free	Never occurred
Heartwater	Free	Never occurred
Infection with Aujeszky's disease virus	Free	Never occurred
Infection with Bluetongue virus	Present	Restricted to specific zones of Australia; sentinel herd and vector-monitoring programs are in place (see Section 2.5).
Infection with *Brucella abortus*	Free	Australia declared freedom in all terrestrial animal species in 1989.
Infection with *Brucella melitensis*	Free	Never occurred in animals
Infection with *Brucella suis*	Serological evidence	Maintained in feral pigs in parts of New South Wales and Queensland. Rare occurrence in domestic pigs. Sporadic detections in pig-hunting dogs (not OIE-notifiable occurrences).
Infection with *Echinococcus granulosus*	Present	–
Infection with *Echinococcus multilocularis*	Free	Never occurred
Infection with epizootic haemorrhagic disease virus	Virus present	Disease has not been reported

Cont'd

*www.oie.int/en/animal-health-in-the-world/oie-listed-diseases-2021

1 www.oie.int/wahis_2/public/wahid.php/Wahidhome/Home/index/newlang/en

Infection/Disease	Status	Date of last occurrence and notes
Infection with foot-and-mouth disease virus	Free	1872. Australia is officially recognised by OIE as free without vaccination.
Infection with *Mycobacterium tuberculosis complex*	Free	Australia declared freedom in 1997 from bovine tuberculosis; the last case in any species was reported in 2002.
Infection with rabies virus	Free	1867
Infection with Rift Valley fever virus	Free	Never occurred
Infection with rinderpest virus	Free	1923. With the global eradication of rinderpest in 2011, all countries are free.
Infection with *Trichinella* spp.	Limited species present	*Trichinella spiralis* is not present. *T. pseudospiralis* is present in wildlife.
Japanese encephalitis	Serological evidence	Serological evidence suggestive of Japanese encephalitis detected seasonally in Torres Strait; however, no confirmed clinical cases since 2004.
New World screw-worm fly (*Cochliomyia hominivorax*)	Free	Never occurred
Old World screw-worm fly (*Chrysomya bezziana*)	Free	Never occurred
Paratuberculosis	Present	National control and management programs are in place.
Q fever	Present	–
Surra (*Trypanosoma evansi*)	Free	Never occurred
Tularaemia	Present	Two probable human cases reported in New South Wales in 2020. No related detections in wildlife.
West Nile fever	Australian variants present	No cases were reported in 2020.
Cattle diseases		
Bovine anaplasmosis	Present	Transmission mainly in areas of northern Australia.
Bovine babesiosis	Present	Transmission mainly in areas of northern Australia.
Bovine genital campylobacteriosis	Present	–

Cont'd

Infection/Disease	Status	Date of last occurrence and notes
Bovine spongiform encephalopathy	Free – 'negligible risk'	Never occurred. The National Transmissible Spongiform Encephalopathies Freedom Assurance Program includes surveillance (see Section 2.5). Australia has official OIE 'negligible risk' status.
Bovine viral diarrhoea	Present	Bovine viral diarrhoea virus 1 (BVDV-1) is present; BVDV-2 has never occurred.
Enzootic bovine leucosis	The dairy cattle herd is free. Very low prevalence in beef cattle.	Australian dairy herd achieved freedom on 31 December 2012.
Haemorrhagic septicaemia	Free	Never occurred. Strains of *Pasteurella multocida* are present, but not the 6b or 6e strains that cause haemorrhagic septicaemia.
Infectious bovine rhinotracheitis/ infectious pustular vulvovaginitis	Present	Bovine herpesvirus (BHV)-1.2b is present; BHV-1.1 and BHV-1.2a have never occurred.
Infection with lumpy skin disease virus	Free	Never occurred
Infection with *Mycoplasma mycoides* subsp. *mycoides* SC (contagious bovine pleuropneumonia)	Free	1967. Australia declared freedom in 1973 and is officially recognised by OIE as free.
Theileriosis	Free	*Theileria orientalis* is present in Australia but OIE-listed species *T. parva* and *T. annulata* are not.
Trichomonosis	Present	–
Trypanosomosis (tsetse-transmitted)	Free	Never occurred
Sheep and goat diseases		
Caprine arthritis/encephalitis	Present	Voluntary accreditation schemes exist.
Contagious agalactia	Free	*Mycoplasma agalactiae* has been isolated, but Australian strains do not produce agalactia in sheep.
Contagious caprine pleuropneumonia	Free	Never occurred
Infection with *Chlamydophila abortus* (enzootic abortion of ewes, ovine chlamydiosis)	Free	Never occurred
Infection with peste des petits ruminants virus	Free	Never occurred. Australia is officially recognised by OIE as free.
Maedi–visna	Free	Never occurred
Nairobi sheep disease	Free	Never occurred

Cont'd

Infection/Disease	Status	Date of last occurrence and notes
Ovine epididymitis (*Brucella ovis*)	Present	Voluntary accreditation schemes exist in all states.
Salmonellosis (*Salmonella* Abortusovis)	Free	Never occurred. Surveillance has shown no evidence of infection in sheep.
Scrapie	Free	1952. The National Transmissible Spongiform Encephalopathies Freedom Assurance Program includes surveillance (see Section 2.5). Atypical scrapie has been detected several times.
Sheep pox and goat pox	Free	Never occurred
Equine diseases		
Contagious equine metritis	Free	1980
Dourine	Free	Never occurred
Equine encephalomyelitis (western)	Free	Never occurred
Equine infectious anaemia	Present	Limited distribution and sporadic occurrence.
Infection with equine influenza	Free	2007. Australia self-declared freedom according to OIE standards in 2008.[2]
Equine piroplasmosis	Free	1976
Infection with African horse sickness virus	Free	Never occurred. Australia is officially recognised by OIE as free.[3]
Infection with equid herpesvirus 1 (EHV-1)	Present	–
Infection with equine arteritis virus	Serological evidence	–
Infection with *Burkholderia mallei* (glanders)	Free	1891
Venezuelan equine encephalomyelitis	Free	Never occurred
Swine diseases		
Infection with African swine fever virus	Free	Never occurred
Infection with classical swine fever virus	Free	1962. Australia is officially recognised by OIE as free.
Infection with porcine reproductive and respiratory syndrome virus	Free	Never occurred
Infection with *Taenia solium* (porcine cysticercosis)	Free	Never occurred
Nipah virus encephalitis	Free	Never occurred

Cont'd

2 www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/Self-declarations/Archives/ENG_archive_2000_December_2020.pdf

3 www.oie.int/en/animal-health-in-the-world/oie-listed-diseases-2021

Infection/Disease	Status	Date of last occurrence and notes
Transmissible gastroenteritis	Free	Never occurred
Avian diseases		
Avian chlamydiosis	Present	–
Avian infectious bronchitis	Present	–
Avian infectious laryngotracheitis	Present	–
Avian mycoplasmosis (*Mycoplasma gallisepticum*)	Present	–
Avian mycoplasmosis (*Mycoplasma synoviae*)	Present	–
Duck virus hepatitis	Free	Never occurred
Fowl typhoid	Free	1952
Infection with avian influenza viruses	Present from 31 Jul 2020 to 25 Feb 2021.	An outbreak involving six properties and three different strains of avian influenza (H7N7 HPAI,[4] H5N2 LPAI[5] and H7N6 LPAI) occurred in July–August 2020.[6] Australia officially achieved HPAI disease freedom on 26 February 2021.
Infection with influenza A viruses of high pathogenicity in birds other than poultry, including wild birds	Free	HPAI viruses have not been detected in Australian wild birds, other than a single detection of HPAI H7 virus in one feral Eurasian starling trapped inside an affected poultry shed during the 1985 HPAI H7 virus outbreak.
Infection with Newcastle disease virus	Lentogenic viruses present	Virulent Newcastle disease last occurred in poultry in 2002. In August 2011, a paramyxovirus not previously reported in Australia was detected in hobby pigeons in Victoria. Disease caused by this virus has not spread to poultry.
Infectious bursal disease (Gumboro disease)	Present	Infectious bursal disease occurs in a mild form and was last reported in 2004. Very virulent strains are not present.
Pullorum disease	Not reported	Last reported in 1992. *Salmonella* Pullorum has been eradicated from commercial chicken flocks.
Turkey rhinotracheitis	Free	Never occurred
Lagomorph diseases and infections		
Myxomatosis	Present	Used as a biological control agent for feral rabbits.
Rabbit haemorrhagic disease	Present	Used as a biological control agent for feral rabbits. A new strain was detected in 2015 and another released in 2017.

Cont'd

4 HPAI = high pathogenicity avian influenza.

5 LPAI = low pathogenicity avian influenza.

6 www.oie.int/en/animal-health-in-the-world/update-on-avian-influenza/2020

Infection/Disease	Status	Date of last occurrence and notes
Bee diseases and infections		
Infection of honey bees with *Melissococcus plutonius* (European foulbrood)	Present	–
Infection of honey bees with *Paenibacillus larvae* (American foulbrood)	Present	–
Infestation of honey bees with *Acarapis woodi*	Free	Never occurred
Infestation of honey bees with *Tropilaelaps* spp.	Free	Never occurred
Infestation of honey bees with *Varroa* spp. (varroosis)	Present	*Varroa destructor* has never been reported in Australia. Incursions of *V. jacobsoni* were identified and stamped out in June 2016 and April 2020. The response is currently in proof-of-freedom phase.
Infestation with *Aethina tumida* (small hive beetle)	Present	Restricted distribution
Other diseases and infections		
Camel pox	Free	Never occurred
Leishmaniasis	Australian variant, *Leishmania macropodum*, present	Rare. Australian variant was first isolated in 2000 from macropods and occurs infrequently in a small region near Darwin. In 2017, it was isolated in a new species, captive Nabarlek (pygmy rock wallaby, *Petrogale concinna*) in the Northern Territory. Occasional imported case of *L. infantum* with no known local transmission.

2.2 National List of Notifiable Animal Diseases of Terrestrial Animals

The National List of Notifiable Animal Diseases of Terrestrial Animals[7] facilitates disease reporting and control by identifying diseases that must be reported to an agricultural authority. The list, agreed by the Animal Health Committee (AHC), includes all diseases notifiable to OIE but also endemic diseases of national significance. The requirement to report occurrences of disease on this list to government authorities is contained in state and territory legislation.

The list is reviewed on a regular basis by AHC, and the most recent review was finalised in 2019. Table 2.2 shows Australia's status for diseases on the National List of Notifiable Diseases of Terrestrial Animals (which are not reportable to OIE) for 2020.

In 2019 and 2020 disease investigations were conducted to detect or exclude nationally notifiable diseases in clinically consistent animals (excluding wildlife and feral animals). Investigations reported are those that included testing at a government veterinary laboratory, and may involve a single animal or multiple animals from the same property.

7 www.agriculture.gov.au/pests-diseases-weeds/animal/notifiable

Table 2.2 Australia's status for other diseases on the National List of Notifiable Diseases of Terrestrial Animals, 2020 (not reportable to OIE)

Disease	Status	Date of last occurrence and notes
Australian bat lyssavirus	Present	–
Devil facial tumour disease	Present	Restricted distribution
Encephalitides (tick-borne)	Free	Never reported
Infection with Borna disease virus	Free	Never reported
Infection with *Brucella canis*	Free	Never reported
Infection with Bungowannah virus (porcine myocarditis)	Present	2003. Restricted distribution, one piggery.
Infection with duck herpesvirus 1 (duck viral enteritis / duck plague)	Free	Never reported
Infection with *Ehrlichia canis* (ehrlichiosis)	Present	Detected for the first time in Australian dogs in May 2020. Restricted distribution.
Infection with equine encephalosis virus	Free	Sporadic occurrence
Infection with Getah virus	Free	Never reported
Infection with Hendra virus	Present	Sporadic occurrence; see Figure 2.9
Infection with *Histoplasma farciminosum* (epizootic lymphangitis)	Free	Never reported
Infection with influenza A viruses in swine	Present	–
Infection with Jembrana disease virus	Free	Never reported
Infection with Menangle virus	Present	1997
Infection with *Mycobacterium avium* (avian tuberculosis)	Present	–
Infection with *Mycoplasma iowae*	Free	
Infection with *Neorickettsia risticii* (Potomac horse fever)	Free	Never reported
Infection with porcine epidemic diarrhoea virus	Free	Never reported. National survey conducted in 2016 with negative results.
Infection with *Pseudogymnoascus destructans* in bats (white nose syndrome)	Free	Never reported
Infection with *Psoroptes ovis* (sheep scab)	Free	1896
Infection with *Salmonella* Abortusequi	Free	Never reported

Cont'd

Disease	Status	Date of last occurrence and notes
Infection with *Salmonella* Enteritidis in poultry	Present	National *Salmonella* Enteritidis Monitoring and Accreditation Program available for commercial egg producers. See Section 2.4
Infection with Seneca Valley virus (Senecavirus A)	Free	Never reported
Infection with swine vesicular disease virus	Free	Never reported
Infection with *Taenia saginata* (cysticercus bovis)	Present	–
Infection with *Teschovirus* A (porcine enteroviral encephalomyelitis)	Present	
Infection with *Trypanosoma cruzi* (Chagas disease)	Free	Never reported
Infection with vesicular stomatitis virus	Free	Never reported
Infection with Wesselsbron virus	Free	Never reported
Louping ill	Free	Never reported
Malignant catarrhal fever (wildebeest-associated)	Free	Never reported
Post-weaning multi-systemic wasting syndrome	Free	Never reported
Pulmonary adenomatosis (jaagsiekte)	Free	Never reported
Transmissible spongiform encephalopathies (chronic wasting disease of deer, feline spongiform encephalopathy)	Free	Two cases of feline spongiform encephalopathy have been diagnosed in imported animals in Australian zoos in 1992 (cheetah) and 2002 (Asiatic golden cat), where exposure before importation to feeds derived from bovine spongiform encephalopathy-affected cattle are thought to have caused the disease.
Vesicular exanthema	Free	Never reported
Warble fly infestation	Free	Never reported

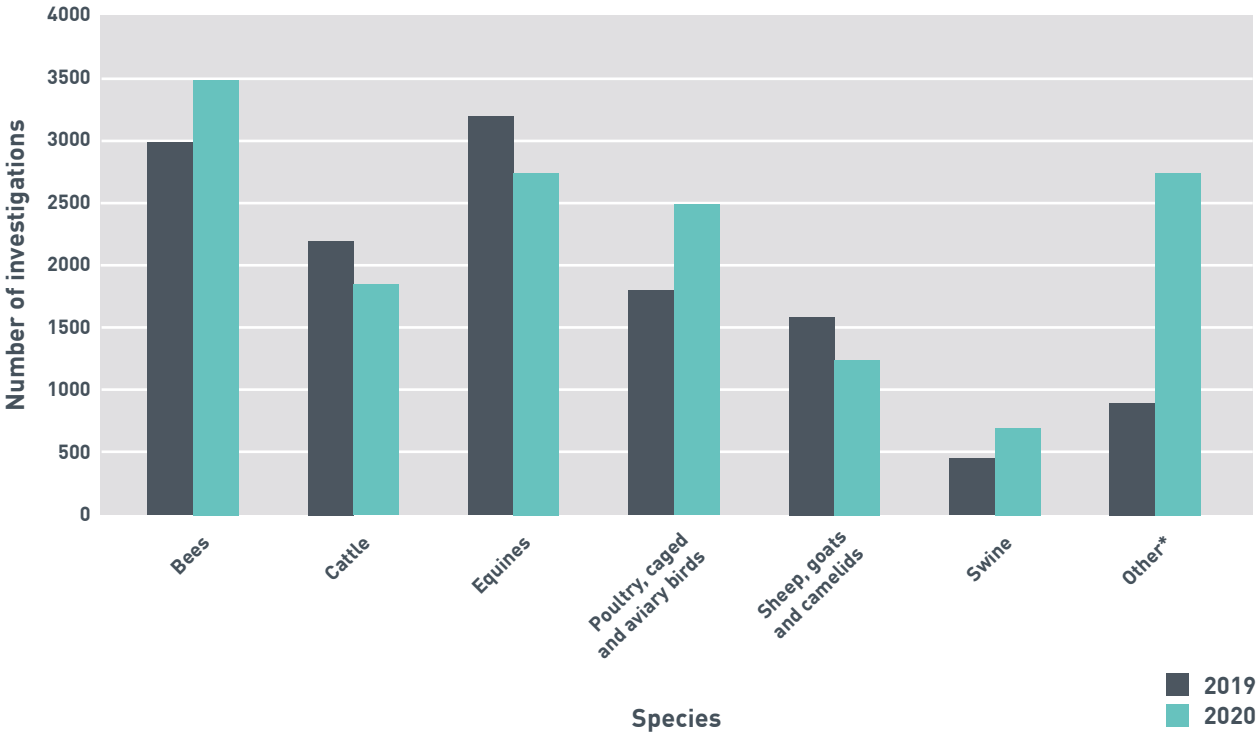
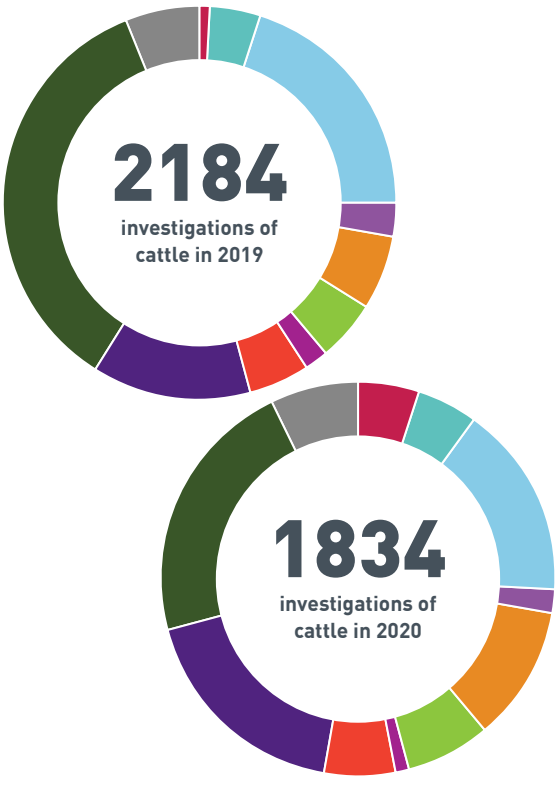


Figure 2.1 Number of investigations for national notifiable diseases in 2019 and 2020

*includes captive (or domestic) cats, dogs, macropods and primates. During 2020 there was there was a large increase in investigations in dogs due to detection of ehrlichiosis. This spanned across multiple jurisdictions.

Note: Disease investigations may involve a single animal or multiple animals. This chart excludes wildlife and feral animals, which are recorded through the Wildlife Health Australia eWHIS database.



	2019	2020
Infection with *Anaplasma marginale* (bovine anaplasmosis) in tick free areas	1%	5%
Infection with *Babesia bovis*, *B. bigemina* or *B. divergens* (bovine babesiosis) in tick free areas	4%	5%
Infection with *Bacillus anthracis* (Anthrax)	20%	16%
Infection with bovine virus diarrhoea virus (type 2)	3%	2%
Infection with *Brucella abortus*	6%	11%
Infection with foot and mouth disease virus	5%	7%
Infection with *Mycoplasma mycoides* subsp. *mycoides* SC (Contagious bovine pleuropneumonia)	2%	1%
Infection with vesicular stomatitis virus	5%	6%
Paratuberculosis - Johne's disease	13%	18%
Transmissible spongiform encephalopathies (bovine spongiform encephalopathy, chronic wasting disease of deer, feline spongiform encephalopathy, scrapie)	35%	22%
Other	6%	7%

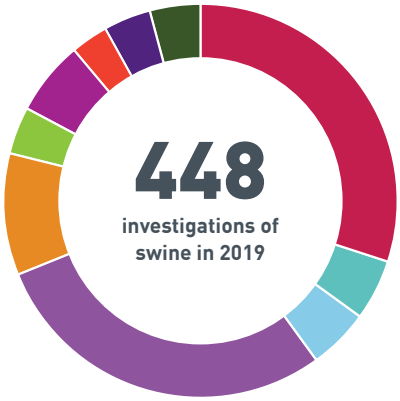
Figure 2.2 National notifiable disease investigations of cattle in 2019 and 2020

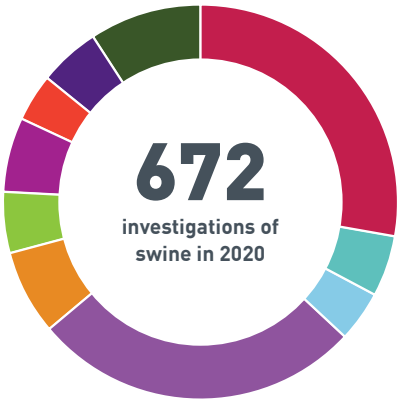
	2019	2020
Bluetongue — clinical disease	5%	8%
Infection with *Bacillus anthracis* (anthrax)	12%	20%
Infection with *Brucella abortus*	1%	1%
Infection with *Chlamydophila abortus* (enzootic abortion of ewes, ovine chlamydiosis)	2%	4%
Infection with foot and mouth disease virus	3%	5%
Infection with *Salmonella* Abortusovis (salmonellosis)	2%	1%
Infection with vesicular stomatitis virus	3%	5%
Maedi–visna	3%	1%
Paratuberculosis (Johne's disease)	9%	15%
Transmissible spongiform encephalopathies	53%	32%
Other	7%	8%

Figure 2.3 National notifiable disease investigations of sheep, goats and camelids in 2019 and 2020

	2019	2020
Infection with African horse sickness virus	0%	2%
Infection with Australian bat lyssavirus	2%	2%
Infection with Eastern, Western or Venezuelan equine encephalomyelitis viruses	2%	2%
Infection with equine arteritis virus	1%	1%
Infection with equine herpesvirus-1 (EHV-1)	21%	19%
Infection with equine infectious anaemia virus	1%	2%
Infection with Hendra virus	65%	60%
Infection with Japanese encephalitis virus	1%	1%
West Nile virus (clinical disease)	5%	9%
Other	2%	2%

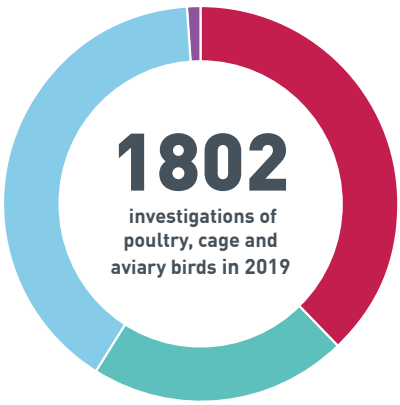
Figure 2.4 National notifiable disease investigations of equines in 2019 and 2020

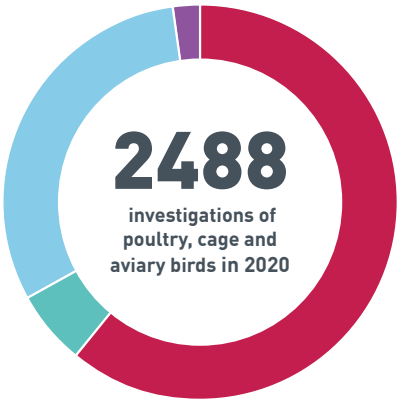




	2019	2020
Infection with African swine fever virus	30%	28%
Infection with Aujeszky's disease virus (pseudorabies virus)	5%	5%
Infection with *Brucella suis*	5%	4%
Infection with classical swine fever virus	29%	27%
Infection with influenza A viruses in swine	10%	7%
Infection with porcine epidemic diarrhoea virus	4%	5%
Infection with porcine reproductive and respiratory syndrome virus	6%	6%
Infection with Teschovirus A (porcine enteroviral encephalomyelitis)	3%	4%
Infection with transmissible gastroenteritis coronavirus	4%	5%
Other	4%	9%

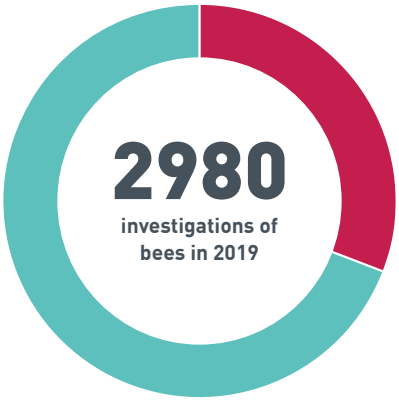
Figure 2.5 National notifiable disease investigations of swine in 2019 and 2020

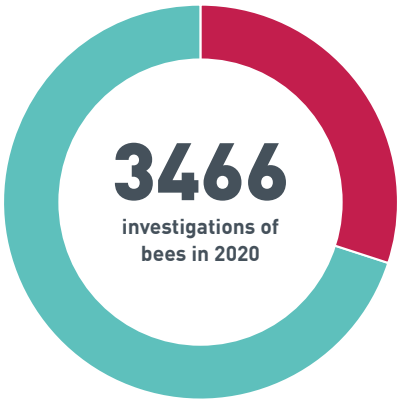




	2019	2020
Infection with influenza A viruses in birds	38%	61%
Infection with *Salmonella Enteritidis* in poultry	21%	6%
Infection with Newcastle disease virus (virulent)	40%	31%
Other	1%	2%

Figure 2.6 National notifiable disease investigations of poultry, cage and aviary birds in 2019 and 2020





	2019	2020
Infection of bees with *Melissococcus plutonius* (European foulbrood)	31%	30%
Infection of bees with *Paenibacillus larvae* (American foulbrood)	69%	70%

Figure 2.7 National notifiable disease investigations of bees in 2019 and 2020

2.3 Significant disease incidents and status changes of nationally notifiable terrestrial animal diseases in 2019 and 2020

This section provides further information about investigations of nationally notifiable terrestrial animal diseases in 2019 and 2020, to support Australia's disease status for OIE-listed diseases as presented in Table 2.1. In particular, it outlines Australia's response to significant trade-related disease incidents, which has helped safeguard Australia's national animal health status through 2019 and 2020. Supplementary information about national notifiable terrestrial animal disease investigations can be found in the *Animal Health Surveillance Quarterly*.[8]

Anthrax

Anthrax is a nationally notifiable animal disease, and is subject to government controls including quarantine, disposal of carcasses, vaccination and tracing of at-risk animals and their products. Areas at risk of anthrax occurrence, which are well defined, include central New South Wales and the northern and northeastern districts of Victoria. In these areas, anthrax has a low prevalence and occurs only sporadically.

In 2019, anthrax incidents were reported in two states. In New South Wales, three anthrax incidents occurred – two near Nyngan in the Central West region, and one in Ivanhoe. The two incidents near Nyngan occurred in February (350 sheep deaths) and December (26 stud cattle and 20 sheep deaths). In October, 50 sheep died on a property in Ivanhoe. In Victoria, anthrax was diagnosed in four sheep that died on a property near Swan Hill in March.

In January 2020, an anthrax incident was reported in New South Wales, confirmed in one ewe with seven deaths in a drought feedlot on a property near Cumnock in the Central West region.

8 www.animalhealthaustralia.com.au/ahsq

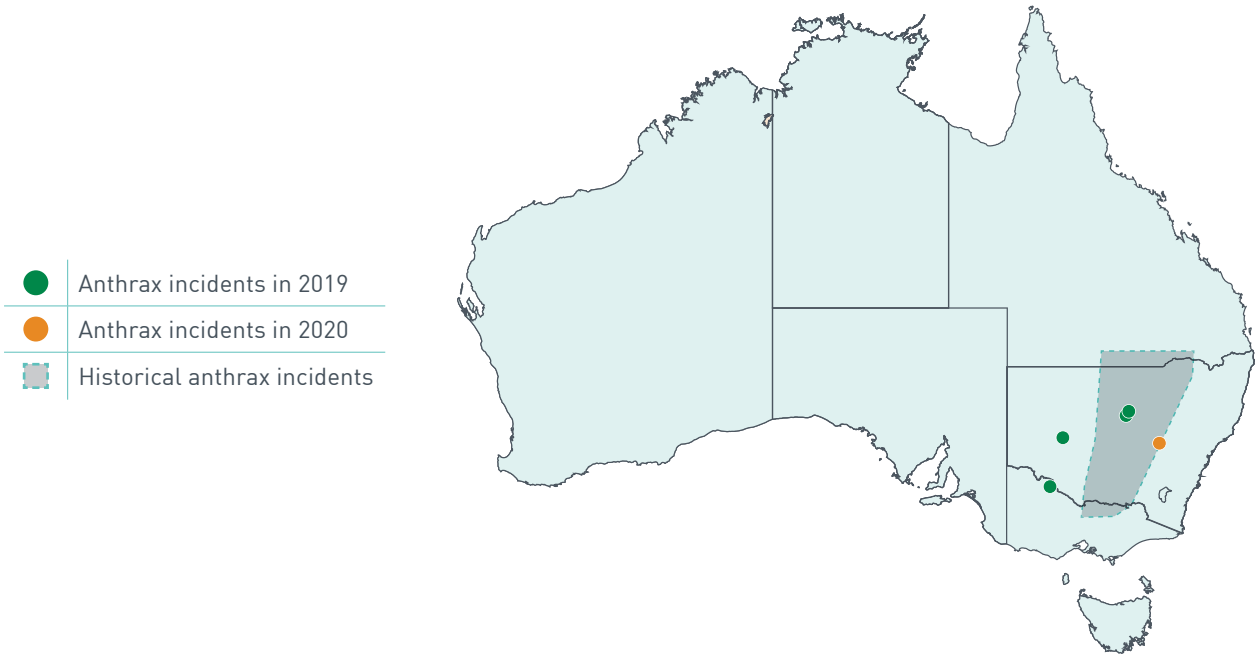


Figure 2.8 Map of anthrax incidents in Australia January 2019 – December 2020

In each case, control measures were implemented based on agreed national response policy, including quarantine and tracing, burning of carcasses and vaccination of livestock. Human health authorities were notified, and public health precautions were implemented. For all exported animals and animal products, Australia ensures that all health requirements are met and certified appropriately.

Avian influenza

In July–August 2020, three incursions of avian influenza (AI) occurred involving three different virus strains across six poultry farms in Victoria. Three egg farms were diagnosed with high pathogenicity AI (HPAI) H7N7, two turkey farms (epidemiologically linked) with low pathogenicity AI (LPAI) caused by the H5N2 virus, and one emu farm caused by an H7N6 LPAI virus.

It is likely that the source of infections was wild birds. It is not unusual for AI virus to be detected in wild birds in Australia. On rare occasions, there is virus spill-over from the wild bird population into domestic poultry.

Victoria mounted a rapid and comprehensive emergency response to eradicate H7N7 HPAI, H5N2 LPAI and H7N6 LPAI in the shortest possible period.

The National Avian Influenza Wild Bird (NAIWB) surveillance program (see Section 2.5) undertakes ongoing surveillance of wild birds.

On 26 February 2021, Australia regained its previous animal health status for AI in accordance with the OIE Terrestrial Animal Health Code.

Bluetongue virus – clinical

Infection of livestock with endemic bluetongue virus (BTV) is known to occur within a transmission zone in northern and parts of eastern Australia, as monitored and defined by the National Arbovirus Monitoring Program (NAMP). The serotypes of BTV circulating in Australia have not generally caused clinical disease.

In February and March 2020, endemic BTV infection was confirmed in sheep at two properties in Queensland within the known BTV transmission zone. The sheep had clinical signs consistent with bluetongue disease, namely fever, swollen muzzles and lameness. Expert assessment determined that this was caused by endemic serotypes that did not represent a change to the virulence of BTV infection in Australia nor to the known BTV transmission zone. The diagnosis does not impact Australia's BTV-free zone status in accordance with OIE guidelines.

Ehrlichia canis

Infection with *Ehrlichia canis* (canine monocytic ehrlichiosis) was confirmed for the first time in Australian dogs in May 2020 in the Kimberley region of Western Australia and in June 2020

in the Northern Territory. National surveillance found *E. canis* to be established in the Northern Territory and northern Western Australia. *E. canis* was detected in South Australia for the first time in November 2020 in brown dog ticks (*Rhipicephalus sanguineus*) from the Anangu Pitjantjatjara Yankunytjatjara (APY) lands in the remote far northern areas of South Australia. These findings informed the decision that eradication was not feasible.

Some movement conditions, focused on tick prevention and control, and testing of dogs prior to movement to areas where *E. canis* is not known to be active, are being maintained by jurisdictions.

2.4 Public health related animal disease investigations

This section outlines animal disease investigations that are closely related to public health. Supplementary information about events can be found in the Animal Health Surveillance Quarterly editions for 2019 and 2020.

Hendra virus

Hendra virus (HeV) is a zoonosis that causes natural infection and disease in horses and humans and is a nationally notifiable animal disease. Numerous HeV incidents have occurred in New South Wales and Queensland since 1994, involving more than 100 horses, most of which have either been euthanased or died as a result of the disease.

Flying foxes are the natural host for HeV. Appropriate risk management for horse owners includes taking steps to minimise the potential for contact between flying-foxes and horses, and to vaccinate their horses against HeV.

In June 2019, a single horse was confirmed to be infected with HeV in the Scone region in the Hunter Valley. In May 2020, a single horse was confirmed to be infected with HeV near Murwillumbah in New South Wales.

The New South Wales and Queensland Governments continue to implement well established biosecurity and public health responses to all HeV incidents, including people and horse movement controls and tracing.

Salmonella Enteritidis

Salmonella Enteritidis (SE) is a bacterial disease of poultry. Birds do not usually show clinical signs of disease. However, SE can cause foodborne illness in humans, usually from the eating of raw or undercooked eggs.

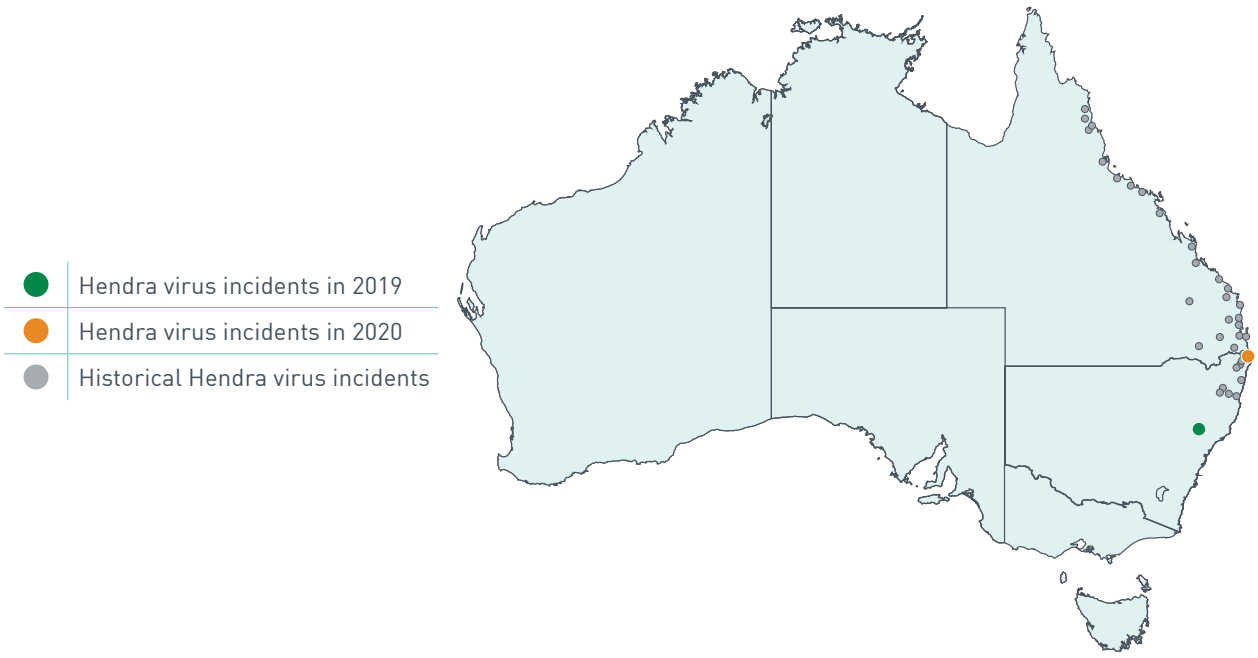


Figure 2.9 Map of Hendra virus incidents in Australia January 2019 – December 2020

Detections of SE were made at 13 poultry egg farms in New South Wales in 2018 and 2019, and in two Victorian commercial egg farms in 2019 and 2020. SE was first detected in a commercial layer farm in New South Wales in September 2018. The layer farm was identified as the source of infection for human health cases reported from the beginning of May 2018. All properties confirmed to have had SE present were interconnected in that people, eggs or equipment were moving between them.

The New South Wales Department of Primary Industries and Agriculture Victoria coordinated measures to contain and eradicate SE from layer flocks using an emergency response structure that was guided by the industry-prepared *Salmonella Enteritidis Response Plan* (2017). In August 2019, the New South Wales Department of Primary Industries implemented an SE Control Order across all poultry businesses in New South Wales. This order legislates that all such businesses must have a minimum standard of biosecurity that will help protect them from SE infection, based on epidemiological lessons learned from the outbreak. In Victoria, Agriculture Victoria continues to implement a control-and-surveillance program to trace and eradicate SE from infected premises.

2.5 Terrestrial animal surveillance programs

Australia's national surveillance system draws upon partnerships and networks involving government agencies, livestock industries, wildlife and commercial organisations and individuals. These networks support a range of national programs and initiatives to investigate significant disease incidents and monitor the distribution and status of specified diseases of significance. An outline of the activities of key national programs during 2019 and 2020 follows. For more information on each of these programs, please refer to the *Animal Health in Australia System Report*.[9]

9 www.animalhealthaustralia.com.au/ahia

National Arbovirus Monitoring Program

The National Arbovirus Monitoring Program (NAMP) monitors the distribution of economically important arboviruses (insect-borne viruses) of livestock (cattle, sheep, goats, and camelids), and associated insect vectors in Australia (*Culicoides* spp. biting midges). Arboviruses monitored by NAMP include bluetongue, Akabane and bovine ephemeral fever viruses. NAMP data are gathered throughout Australia by serological monitoring of cattle in sentinel herds, strategic serological surveys of other cattle herds, and trapping of insect vectors.

A BTV transmission zone map was maintained throughout 2019 and 2020, and was publicly available to inform producers on the distribution of arboviruses and facilitate them to make management decisions. The limits of BTV transmission in Australia are shown on this map.[10] The BTV transmission zone boundary is updated promptly following confirmation of changes to the distribution of BTV transmission. During the period, six changes were made to the zone boundary, including four in New South Wales and two in Queensland. BTV typing occurred to determine serotypes circulating in Australia. BTV types detected during the period were 1, 7, 16 and 21.

During the 2018–2019 and 2019–2020 arbovirus monitoring seasons, NAMP continued monitoring at three additional sites (initiated in 2017–2018) in Victoria (in the transmission-free zone) to detect if the epidemiology of bluetongue virus is undergoing changes. No evidence of transmission and no known vectors were detected.

A more detailed description of NAMP and results of monitoring through each arbovirus transmission season (September–August) are published annually.[11]

National Significant Disease Investigation Program

Non-government veterinary practitioners (private veterinary practitioners) play a key role in general surveillance in Australia, providing expertise for

10 namp.animalhealthaustralia.com.au

11 www.animalhealthaustralia.com.au/what-we-do/disease-surveillance/national-arbovirus-monitoring-program

evaluating, clinically investigating and reporting outbreaks of significant disease in animals. The National Significant Disease Investigation Program supports veterinary practitioners to investigate and report on significant disease events in livestock and wildlife.

During 2019, 425 disease investigations were subsidised as part of the program (Figure 2.10), and in 2020 more than 290 investigations were subsidised (Figure 2.11, based on data available at time of writing). Four training activities were subsidised under the program in 2019, targeted at private veterinarians in New South Wales, the Northern Territory and Queensland.

Further information on the National Significant Disease Investigation Program is available on the Animal Health Australia (AHA) website.[12]

National Sheep Health Monitoring Program

The National Sheep Health Monitoring Project (NSHMP) is managed by AHA and monitors lines of sheep in abattoirs for several important animal health conditions. The NSHMP generates a comprehensive, contemporary dataset that provides a snapshot of the animal health status of the Australian flock.

During the 2019 calendar year, the NSHMP captured data from a record number of sheep, having inspected 9 573 703 sheep from 42 059 lines and 9609 Property Identification Codes (PICs) across 11 domestic and export abattoirs. During the 2020 calendar year, 8 759 111 sheep from 37 565 lines and 8681 PICs across 10 domestic and export abattoirs were recorded. A combination of COVID-19 restrictions affecting the operations at one abattoir and a good season resulted in fewer sheep being inspected in 2020.

National Transmissible Spongiform Encephalopathies Surveillance Program

The Transmissible Spongiform Encephalopathies Freedom Assurance Project (TSEFAP), which is funded by nine industry stakeholders, state and territory governments as well as the Australian Government, aims to increase market confidence that Australian animals and animal products are free from transmissible spongiform encephalopathies (TSEs). This is achieved through the structured and nationally integrated management of animal-related TSE activities by AHA.[13]

Projects that operate under TSEFAP are:

- National Transmissible Spongiform Encephalopathies Surveillance Project (NTSESP);
- the Australian ruminant feed-ban scheme, including inspections and testing;
- imported animal surveillance for cattle imported from countries that subsequently reported bovine spongiform encephalopathy (BSE); and
- communications.

NTSESP demonstrates Australia's ability to meet the requirements for BSE negligible risk and classical scrapie free statuses and to provide early detection of these diseases should they occur.

In 2019 and 2020, Australia maintained freedom from classical scrapie and continued to be recognised by OIE as a country of negligible risk for BSE. Australia implements a targeted program in line with OIE requirements, and submits data to OIE each year to reconfirm Australia's free status.

Four cases of atypical scrapie were found during 2019–2020, demonstrating the effectiveness of NTSESP. These cases are reported in the *Animal Health Surveillance Quarterly*.[14]

Screw-Worm Fly Surveillance and Preparedness Program

The Screw-Worm Fly Surveillance and Preparedness Program (SWFSPP) is a national program managed by AHA that is focused on early detection and preparedness in the event of an incursion of screw-worm fly.

During 2019 and 2020, surveillance was undertaken for both Old World screw-worm fly (OWS) (*Chrysomya bezziana*) and New World

12 www.animalhealthaustralia.com.au/what-we-do/disease-surveillance/national-significant-disease-investigation-program

13 www.animalhealthaustralia.com.au/what-we-do/disease-surveillance/tse-freedom-assurance-program

14 www.animalhealthaustralia.com.au/our-publications/animal-health-surveillance-quarterly

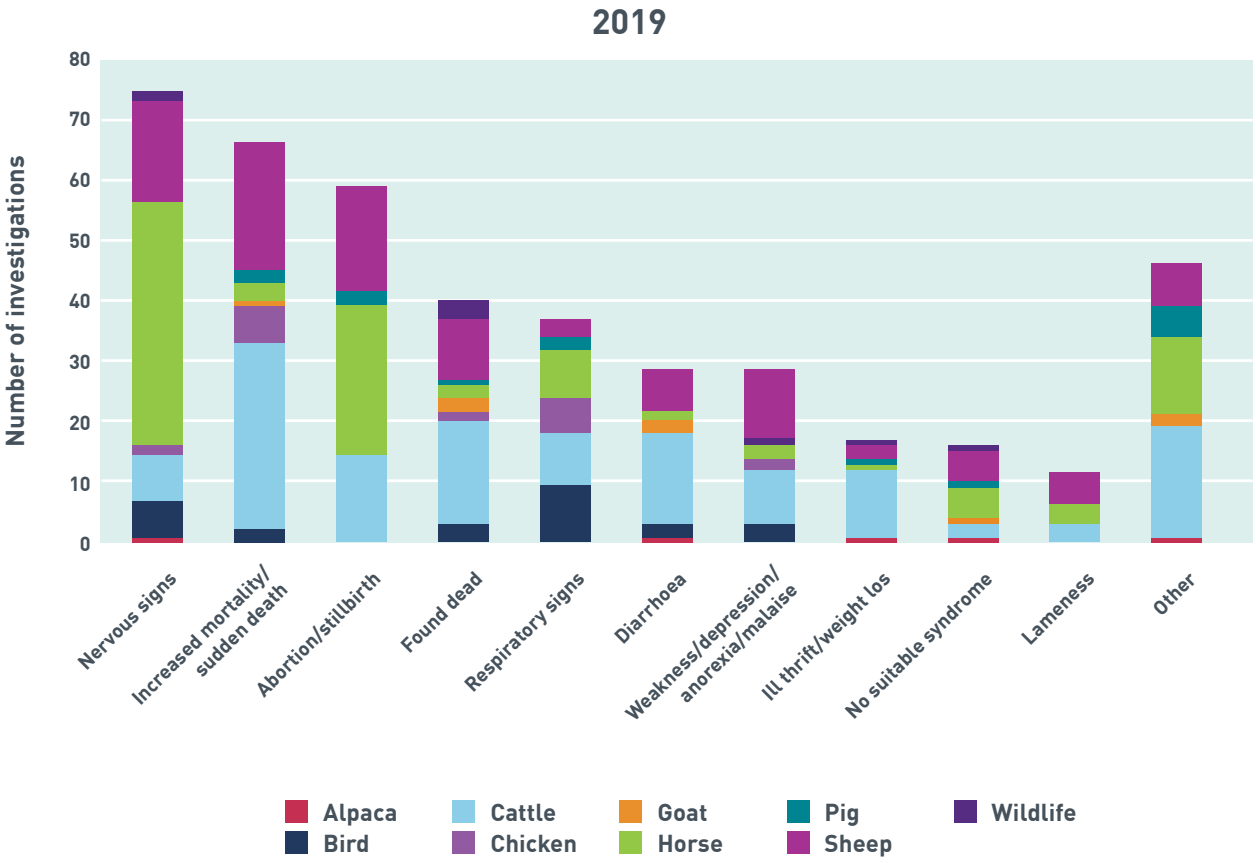


Figure 2.10 Number of investigations, by syndrome and animal group, in the National Significant Disease Investigation Program, January – December 2019

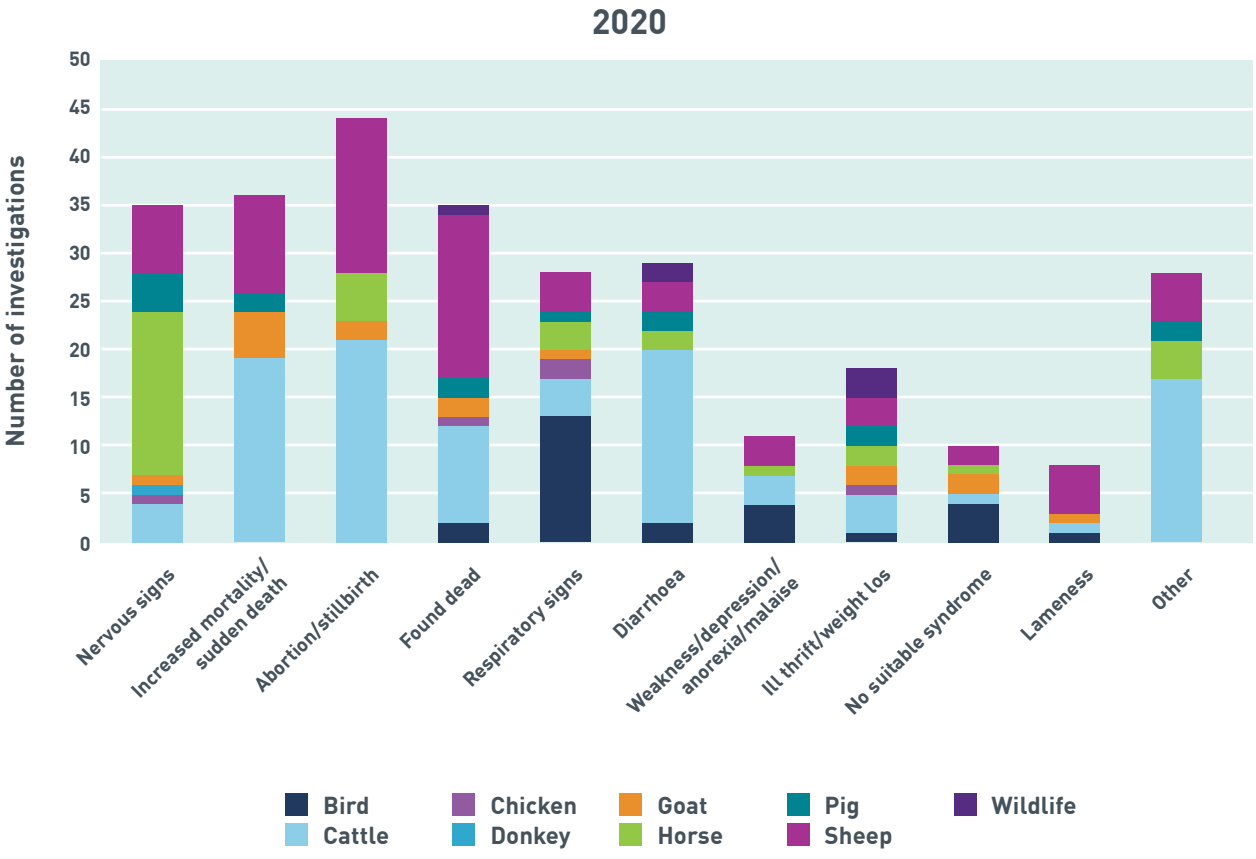


Figure 2.11 Number of investigations, by syndrome and animal group, in the National Significant Disease Investigation Program, January – December 2020*

* based on data available at time of development

screw-worm fly (NWS) (*Cochliomyia hominivorax*). Surveillance comprised fly trapping and targeted livestock wound surveys for myiasis. In addition, 590 maggot collection kits were produced for distribution to producers, private veterinarians and other key animal health stakeholders, to increase awareness of screw-worm fly and general surveillance for myiasis.

During 2019 and 2020, fly trapping occurred at nine locations and 23 sites within locations, with a total of 216 trapping events undertaken in 2019 and 260 in 2020. Targeted myiasis monitoring was conducted at seven locations and 13 sites within locations, comprising 20 775 cattle or domestic animal surveys in 2019 and 18 065 in 2020.

Australian Pork Limited Evidence of Absence Surveillance Project

In 2017, Australian Pork Limited initiated the Evidence of Absence Surveillance Project to increase surveillance for specified exotic pig diseases. The project was developed in consultation with specialist pig veterinarians, and aimed to increase the number of exclusion tests undertaken for morbidity and mortality. The exotic diseases for exclusion included African swine fever (ASF), classical swine fever, porcine reproductive and

Figure 2.12 Locations of targeted myiasis monitoring and fly trapping in the Screw-Worm Fly Surveillance and Preparedness Program

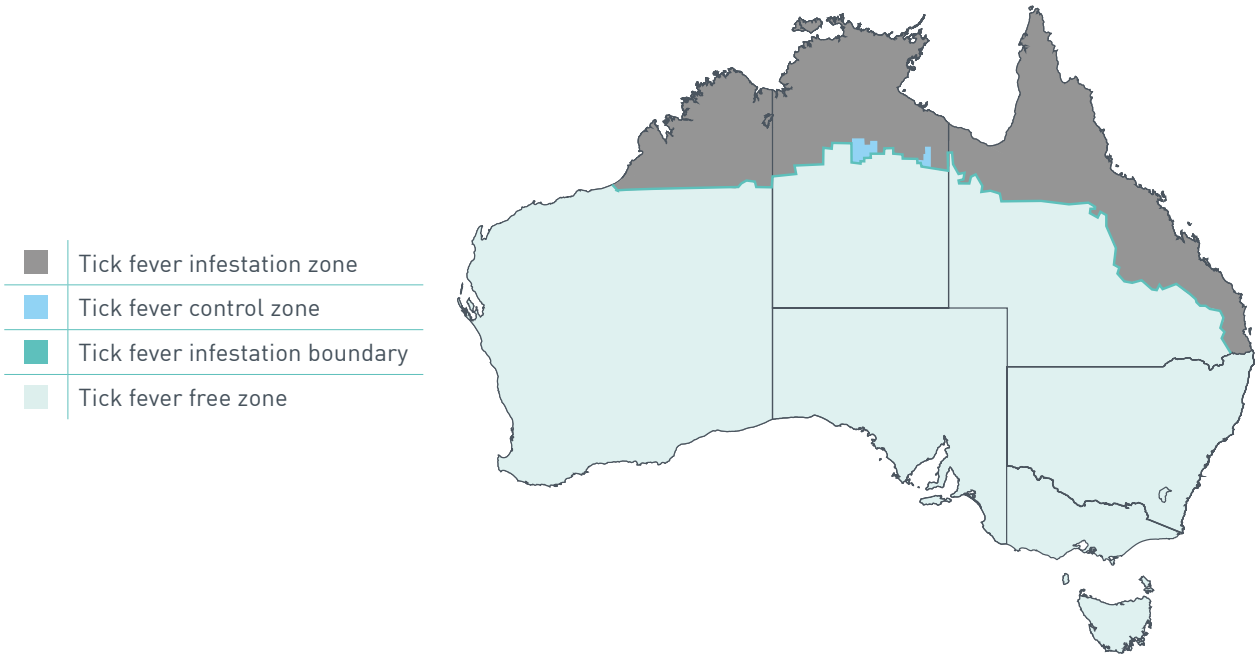


Figure 2.13 Tick fever zones as at 31 December 2020

respiratory syndrome, transmissible gastroenteritis, porcine epidemic diarrhoea, Aujeszky's disease and porcine teschovirus encephalomyelitis.

The project was delivered by AHA and draws on a series of guidelines[15] describing the clinical syndromes associated with exotic pig diseases of high priority for Australia. A government contact point was established within each state for veterinarians to liaise on the project. During 2019 and 2020, there was an increase in exclusion testing for relevant diseases, with summary records of investigations collated as part of Australia's National Animal Health Information Program.

Cattle tick and tick fever

The cattle tick, *Rhipicephalus* (formerly *Boophilus*) *microplus* or *R. australis*, mainly infests cattle, but may occasionally affect other species such as horses, sheep, goats, camelids, deer and water buffalo. Ticks also transmit tick fever (bovine babesiosis or anaplasmosis), caused by *Babesia bigemina*, *B. bovis* or *Anaplasma marginale*. Babesiosis and anaplasmosis are national notifiable animal diseases in tick-free areas. Cattle tick is managed by individual state and territory programs. The tick fever zones are shown in Figure 2.13, with regions of Northern Territory, Queensland and Western Australia defined as cattle tick areas.

15 https://australianpork.com.au/wp-content/uploads/2019/01/Evidence-of-Absence-Surveillance-Project-.pdf

Northern Australia Quarantine Strategy

The Northern Australia Quarantine Strategy (NAQS), within the Australian Government Department of Agriculture, Water and the Environment, was established in 1989 to provide an integrated approach toward the complex and unique biosecurity risk profile of northern Australia.[16] The surveillance program within NAQS employs almost 30 specialist scientists, including six veterinarians, nine entomologists, two molecular biologists and an aquatic scientist.

In 2019 and 2020, NAQS conducted targeted and general surveillance to support the early detection of pests and diseases that may establish across the north of Australia via natural or human-mediated means. A high proportion of pigs were sampled due to the large feral pig population across northern Australia, as well as their capability to host a number of exotic animal pests and diseases. These surveillance activities included the following:

- Targeted animal health surveys of both feral and domestic animals, including routine sample collection and testing for a number of diseases exotic to Australia (Figure 2.14). Furthermore, abnormal clinical signs or pathology detected during these surveys undergo further diagnostic work-up and exotic disease exclusion testing (Table 2.3).

16 www.agriculture.gov.au/biosecurity/australia/naqs

- Targeted environmental sampling of wild waterfowl to monitor for AI, as part of NAIWB.
- Monitoring for exotic serotypes and vectors of BTV and other arboviruses, through sentinel and serosurveillance cattle herds and light trapping, contributing to NAMP.
- Targeted monitoring in the Northern Peninsula Area, adjacent to the Torres Strait, for screw-worm fly and a number of zoonotic flaviviruses, including Japanese encephalitis.
- Both targeted and general biosecurity public awareness. A communication strategy to support ASF preparedness commenced in late 2019. Targeted awareness for African horse sickness, lumpy skin disease and *Ehrlichia canis* have also been delivered during 2020.
- Ad hoc significant disease investigations in response to biosecurity or animal health concerns reported by third parties, such as Indigenous rangers, pastoralists or members of the public.

In addition to delivering surveillance, NAQS also supported other stakeholders to conduct surveillance, including:

- Indigenous ranger groups delivering surveillance activities on a fee-for-service basis via the Indigenous ranger program.
- Private veterinarians working in northern Australia, via the Northern Australia Biosecurity Surveillance Significant Disease Network.

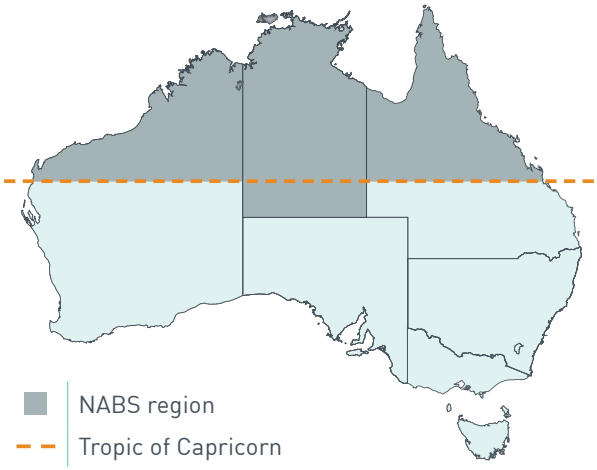


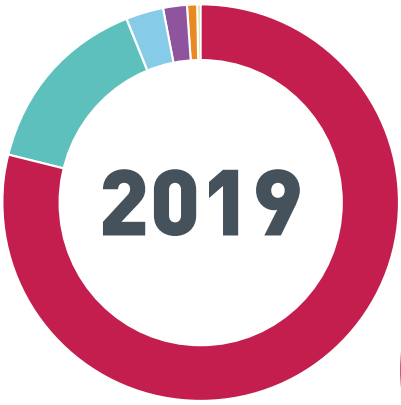
Figure 2.14 Northern Australia Biosecurity Surveillance (NABS) region

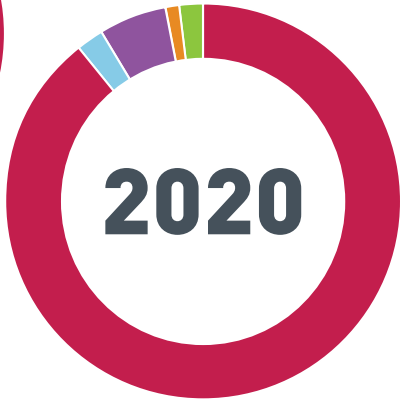
Wildlife health surveillance

Wildlife Health Australia (WHA) administers Australia's general wildlife health surveillance system, in partnership with government agencies and non-government organisations.

During 2019, 1059 wildlife disease investigation events were added to the national database (Table 2.4). Approximately 64% of these events were bats (mostly submitted for exclusion testing for ABLV); bird events accounted for a further 17% of investigations reported; and a further 11% related to marsupials.

During 2020, 826 wildlife disease investigation events were added to the national database (Table 2.5). Approximately 47% of these events were bats (mostly submitted for exclusion testing for





	2019	2020
Swine	79.1%	89.4%
Canines	15%	-
Cattle	2.9%	2%
Water Buffalo	2%	5.8%
Goats	0.8%	1%
Equines	0.2%	1.8%

Figure 2.15 Percentage of each species sampled across northern Australia in 2019 and 2020 by NAQS feral and domestic animal surveys.

Table 2.3 Pathogen tests for disease investigations by NAQS in 2019 and 2020 in northern Australia[a]

Pathogen tested	2019 Number of negative results	2019 Number of positive results	2020 Number of negative results	2020 Number of positive results
African swine fever virus	11	0	10	0
Aujeszky's disease	12	0	23	0
Brucella spp.	0	0	3	0
Burkholderia pseudomallei	0	0	4	0
Classical swine fever virus	12	0	23	0
Leptospira	0	0	2	0
Porcine circovirus type 2	0	0	4	0
Porcine reproductive and respiratory syndrome virus	0	0	4	0
Pox virus	0	0	0	3[b]
Trypanosoma evansi	14	0	23	0

a Animals were often tested for multiple pathogens. In total, 14 animals were investigated in 2019 and 23 animals were investigated in 2020.

b Confirmed as suipoxvirus.

Table 2.4 Wildlife disease investigation events in 2019

Animals	Number of investigations[a]
Bats	677
Birds	175
Marsupials	119
Feral mammals	33
Marine mammals	23
Snakes and lizards	10
Freshwater and marine turtles	10
Monotremes	7
Frogs	3
Rodents	1
Fish	1
Exotics	1

a One event involved turtles and birds, so total events do not equal 1059.

Table 2.5 Wildlife disease investigation events in 2020

Animals	Number of investigations[a]
Bats	388
Birds	221
Marsupials	144
Feral mammals	39
Snakes and lizards	10
Marine mammals	9
Monotremes	7
Frogs	4
Freshwater turtles	3
Rodents	2
Fish	1

a One event involved birds, fish and lizards, so total events do not equal 826.

ABLV), bird events accounted for a further 27% of investigations reported, and a further 17% related to marsupials.

The majority of bat investigations involved individual bats submitted for Australian bat lyssavirus (ABLV) testing. Bats are tested for ABLV for a variety of reasons, most commonly following potentially infectious contact with a human – for example a bite or scratch – or with a pet dog or cat.

A total of 699 bats were tested for ABLV in 2019. Of these, seven flying-foxes from NSW and Queensland were found to be infected with ABLV. A total of 398 bats were tested for ABLV in 2020. Of these, 16 flying-foxes from NSW, Queensland and Victoria were found to be infected with ABLV. There were no detections of ABLV infection in 2019 and 2020 in species other than bats. WHA coordinates a focus group that works to improve national coordination of issues associated with bat health, within the broader context of biosecurity, public health, livestock health and environmental impacts. The group publishes regular reports on the status of Australian bat lyssavirus (ABLV) in Australia. ABLV is a nationally notifiable disease.[17]

Bat disease investigations also include monitoring for diseases of biodiversity concern including exclusion testing for the exotic disease white-nose syndrome (WNS) in microbats. WNS is a fungal disease that has killed millions of insectivorous bats in North America. WNS was excluded in four events in 2019 and two events in 2020. Work to reduce the risk of introduction of WNS into Australia, and to better prepare Australia for a possible incursion of this disease, is ongoing.[18] In 2020 the risk of transmission of SARS-CoV-2 from humans to bats in Australia was assessed, and information was developed to assist bat carers, researchers and others interacting with bats to manage the potential risk.[19]

Wild bird mortality or morbidity investigations include both single animal and multiple animal (mass mortality) events. Findings in 175 wild bird disease investigations in 2019 included aspergillosis, avian chlamydiosis, avian pox, botulism, coccidiosis, dermatomycosis, *Escherichia coli* infection, haemoproteus, lorikeet paralysis syndrome, *Macrorhabdus ornithogaster* infection, *Salmonella* spp. infection, spironucleosis, parasitism, pigeon paramyxovirus 1, poisoning, psittacine and non-psittacine beak and feather disease, rhabdomyosarcoma, toxoplasmosis, trichomoniasis and trauma. Findings in 221 wild bird disease investigations in 2020 included aspergillosis, avian chlamydiosis, avian pox, botulism, coccidiosis, lorikeet paralysis syndrome, *Macrorhabdus ornithogaster* infection, mange, mycobacteriosis, myiasis (non-warble, non-screw-worm), non-pestis yersiniosis, *Salmonella* spp. infection, spironucleosis, parasitism, *Pseudomonas aeruginosa* septicaemia, pigeon paramyxovirus 1, poisoning, psittacine beak and feather disease, toxoplasmosis, trichomoniasis and trauma. No wild bird mortality events in 2019 and 2020 were attributed to AI or West Nile virus.

Significant wildlife incidents in 2019 and 2020

- In 2019 and 2020, as in recent years, climate-related wildlife mass mortality events affecting a wide range of species have continued to occur, including bushfires, heat stress and starvation events in flying-foxes, drought-related mortalities in feral horses and kangaroos, and heat-stress-related mortalities in ringtail possums.
- Wobbly possum disease was detected in Tasmania in 2019,[20] mainly affecting multiple brushtail possums in the south of the state. A nidovirus was identified as the likely causative agent through immunohistochemistry, polymerase chain reaction (PCR) assay and next-generation sequencing. Wobbly possum disease is a severe, progressive neurological disease of Australian brushtail possums (*Trichosurus vulpecula*).
- In 2019, a mass mortality starvation event occurred due to climate-related food shortage in grey-headed (*Pteropus poliocephalus*) and black flying-foxes (*P. alecto*) from northern New South Wales to central Queensland.[21]

17 www.wildlifehealthaustralia.com.au/ProgramsProjects/BatHealthFocusGroup.aspx

18 www.agriculture.gov.au/pests-diseases-weeds/animal/white-nose-syndrome

19 www.wildlifehealthaustralia.com.au/ProgramsProjects/BatHealthFocusGroup.aspx#COVIDBats

20 https://dpipwe.tas.gov.au/wildlife-management/caring-for-wildlife/brushtail-possums-with-neurological-symptoms

21 www.wildlifehealthaustralia.com.au/DiseaseIncidents/OngoingIncidents.aspx#GHFF

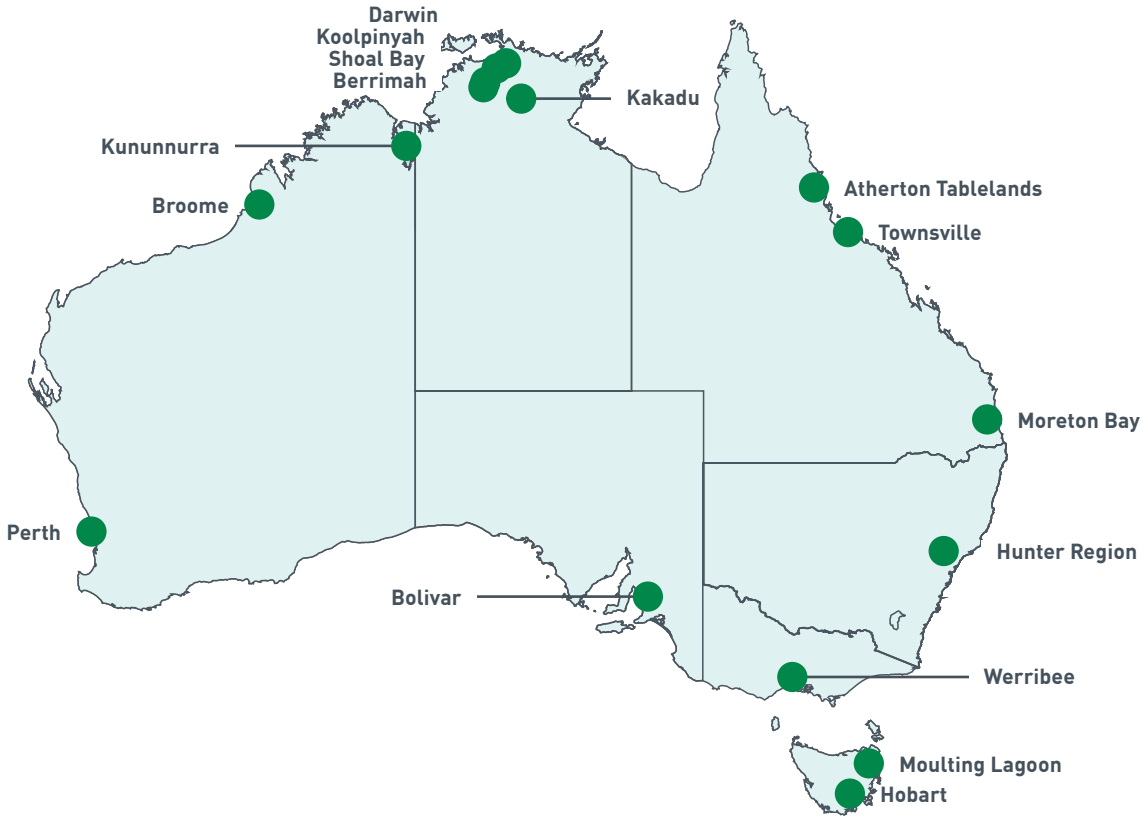


Figure 2.16 National Avian Influenza Wild Bird Surveillance Program – targeted surveillance key sampling locations
Note: This map shows locations where the majority of wild bird samples are collected from, on a regular basis. Locations sampled irregularly or where small numbers of samples are collected are not represented on the map.

- In January 2019, deaths of house sparrows (*Passer domesticus*) occurred in Victoria due to *Salmonella* Typhimurium DT160.[22,23]
- Two probable human cases of tularaemia were detected in New South Wales in the first half of 2020, with links in one case to bites and scratches from a possum, and in the other to wildlife necropsy; however, there were no related detections in wildlife.[24] Tularaemia was excluded in 15 wildlife investigations across Australia during 2019–2020.
- Avian chlamydiosis was detected in Australian king parrots (*Alisterus scapularis*) and crimson rosellas (*Platycercus elegans*) in the Blue Mountains region of New South Wales in 2020, and in crimson rosellas in Victoria in 2019.[25]
- Endemic leishmaniasis was detected in a wild agile wallaby (*Macropus agilis*) in the Northern Territory's rural Darwin region in early 2020.[26]

National Avian Influenza Wild Bird Surveillance Program

The NAIWB surveillance program undertakes targeted surveillance of apparently healthy and hunter-shot wild birds, and general surveillance of significant unexplained morbidity and mortality events in wild birds.

Since July 2005, over 116 300 wild birds have been tested for AI viruses (AIVs), with a subset of samples also tested for avian orthoavulavirus 1 (AOAV-1, which includes Newcastle disease [ND] virus).

In 2019 and 2020, targeted (pathogen-specific, risk-based) surveillance was conducted by sampling apparently healthy, live and hunter-shot wild birds at sites in New South Wales, Northern Territory, Queensland, South Australia, Tasmania, Victoria and Western Australia. (Figure 2.16)

22 www.wildlifehealthaustralia.com.au/Portals/0/Documents/FactSheets/Avian/Salmonella%20Typhimurium%20DT160%20in%20House%20Sparrows%20in%20Australia.pdf

23 www.sciquest.org.nz/elibrary/download/157857/Wildlife_Health_Australia.pdf

24 www.sciquest.org.nz/elibrary/download/165245/Wildlife_Health_Australia.pdf

25 www.sciquest.org.nz/elibrary/download/163911/Wildlife_Health_Australia.pdf

26 www.sciquest.org.nz/elibrary/download/165066/Wildlife_Health_Australia.pdf

In 2019, a total of 5425 faecal environmental, cloacal and/or oropharyngeal swabs collected from waterbirds were tested for AI viruses, with a subset (n = 1610) also tested for AOAV-1. In 2020, a total of 6579 faecal environmental, cloacal and/or oropharyngeal swabs collected from waterbirds were tested for AI viruses, with a subset (n = 1476) also tested for AOAV-1.

No HPAI viruses or virulent strains of AOAV-1 have been identified. However, surveillance activities continue to result in evidence of a wide range of subtypes of AI viruses of low pathogenicity. In 2019, subtypes detected included H1, H2, H3, H4, H5, H6, H7, H8, H9, H10, H11, H13, H16 whereas in 2020, subtypes detected included H1, H2, H4, H5, H6, H7, H9 and H11. Avirulent strains of AOAV-1 were detected in 2019 but were not detected in 2020.

General surveillance includes diagnostic testing in wild bird mortality events to exclude, when appropriate, diseases caused by AIV, AOAV (including ND and PPMV-1) and West Nile virus.

WHA received 175 reports in 2019 and 221 reports in 2020 of wild bird mortality or morbidity investigations from around Australia, ranging from single animal to multiple animal (mass mortality) events. No wild bird mortality events were attributed to AIV or West Nile virus.

AIV was specifically excluded by PCR testing for influenza A in 82 of the events in 2019 and 130 events in 2020. In addition, AOAV was excluded in 72 events in 2019 and 121 in 2020 by PCR testing specific for ND virus and/or PPMV-1. AI and APMV exclusion testing was not warranted in the remaining events on the basis of clinical signs, history, prevailing environmental conditions or other diagnoses.

See WHA's Avian Influenza Wild Bird Surveillance webpage, *Avian Influenza in Wild Birds* fact sheet and *Wild Bird Newsletter* for more information.[27]

National Bee Pest Surveillance Program

An enhanced National Bee Pest Surveillance Program (NBPSP) came into effect in December 2016, building on existing activities and incorporating new methodologies. The program uses a variety of activities to detect 14 exotic bee pests and pest bees, four regionalised but significant bee pests, and continued surveillance of European honey bee (*Apis mellifera*, EHB) swarms at ports that could have hitchhiked on cargo and be carrying exotic pests (see Figure 2.17). See the Plant Health Australia website for further information.[28]

Figure 2.17 Locations of airports and seaports involved in the National Bee Pest Surveillance Program

27 www.wildlifehealthaustralia.com.au/ProgramsProjects/WildBirdSurveillance.aspx

28 www.planthealthaustralia.com.au/national-programs/national-bee-pest-surveillance-program

Table 2.6 Bee surveillance statistics for the 2019 and 2020 calendar years[a]

	Key statistics 2019	Key statistics 2020	Notes
Sentinel hives[b]	• 164 hives across 32 ports. • Minimum of 3900 surveillance activities undertaken.[c] • 165 sampling activities for exotic internal mites. • 294 samples tested for exotic viruses.	• 175 hives across 33 ports. • Minimum of 4100 surveillance activities undertaken.[c] • 192 sampling activities for exotic internal mites. • 281 samples tested for exotic viruses.	All surveillance reports were negative for exotic bee pests apart from reports of braula fly and small hive beetle within known established locations.
Floral sweeps[d]	• 164 floral sweep surveys across 20 ports.	• 129 floral sweep surveys across 20 ports.	No pest bees were recorded, except for the presence of bumble bees within known established locations.
Swarm and catchboxes[e]	• 194 catchboxes deployed across 26 ports. • 9 EHB swarms and 2 AHB swarms captured in catchboxes. • 5 EHB swarms captured on structures at or near ports.	• 208 catchboxes deployed across 26 ports. • 8 EHB swarms and 1 AHB swarm captured in catchboxes. • 3 EHB swarms and 1 AHB swarm captured on structures at or near ports.	All captured swarms were free from exotic bee pests and diseases.

EHB: European honey bee. AHB: Asian honey bee.

a Data provided for 2019 and 2020 does not include surveillance activities that took place as part of the National Varroa Mite Eradication Program in Townsville, Queensland.

b Hives of European honey bees of a known health status which are routinely inspected for external and internal exotic bee pests and diseases, and established pests.

c Methods used for hive surveillance include sticky mats with or without the application of acaricides, sugar shaking, drone uncapping or alcohol washing, insertion of traps, visual inspection and sample collection of adult bees sent for either dissection or molecular diagnostic test.

d Floral-sweep netting is carried out near ports to provide early detection of exotic pest bees.

e Swarms recovered from strategically placed empty catchboxes (targeting only cavity dwelling species) or swarms reported by state or territory departments of agriculture found on structures at ports are captured, identified, and inspected for all exotic bee pests. Information presented does not account for pre-border or border work undertaken by the Commonwealth Department of Agriculture, Water and the Environment.

Image credit: iStock

3

Aquatic animal health status

This chapter provides details on the status of aquatic animal health in Australia, including disease events in 2020. Australia has a robust reporting system for aquatic animal diseases of national significance. Australia's National List of Reportable Diseases of Aquatic Animals[29] includes all aquatic animal diseases currently listed by the World Organisation for Animal Health (OIE), and other aquatic animal diseases of national significance.

Consistent and accurate reporting is important to demonstrate Australia's claims to freedom from diseases of international significance, to support trade of seafood products, and to justify biosecurity measures. Our disease reporting demonstrates transparency to trading partners and a commitment to disease management and biosecurity.

3.1 Status of aquatic animal health in Australia

In 2020, 10 fish diseases, seven mollusc diseases, nine crustacean diseases and three amphibian diseases were listed by OIE. Australia is free from most of these diseases. Australia's status for each OIE-listed aquatic animal disease in 2020 is shown in Table 3.1. For OIE-listed diseases that are present, the maps in Figure 3.2 indicate states and territories in which those diseases are reported.

Australia's status in relation to other nationally reportable aquatic animal diseases in 2020 is listed in Table 3.2.

Table 3.1 Australia's status for OIE-listed diseases of aquatic animals, 2020

Disease or agent	Status
Finfish diseases	
Infection with *Aphanomyces invadans* (epizootic ulcerative syndrome)	Last reported 2017
Infection with epizootic haematopoietic necrosis virus	Last reported 2012
Infection with *Gyrodactylus salaris*	Never reported
Infection with haemorrhagic septicaemia virus	Never reported
Infection with HPR-deleted or HPR0 infectious salmon anaemia virus	Never reported
Infection with koi herpesvirus	Never reported
Infection with red sea bream iridovirus	Never reported
Infection with salmonid alphavirus	Never reported
Infection with spring viraemia of carp virus	Never reported
Infectious haematopoietic necrosis virus	Never reported
Mollusc diseases	
Infection with abalone herpesvirus	Last reported 2011
Infection with *Bonamia ostreae*	Never reported
Infection with *B. exitiosa*	Last reported 2019
Infection with *Marteilia refringens*	Never reported
Infection with *Perkinsus marinus*	Never reported
Infection with *P. olseni*	Last reported 2020
Infection with *Xenohaliotis californiensis*	Never reported
Crustacean diseases	
Acute hepatopancreatic necrosis disease	Never reported

Cont'd

29 www.agriculture.gov.au/animal/aquatic/reporting/reportable-diseases

Disease or agent	Status
Infection with *Aphanomyces astaci* (crayfish plague)	Never reported
Infection with *Hepatobacter penaei* (necrotising hepatopancreatitis)	Never reported
Infection with hypodermal and haematopoietic necrosis virus	Last reported 2020
Infection with infectious myonecrosis virus	Never reported
Infection with *Macrobrachium rosenbergii* nodavirus (white tail disease)	Last reported 2008
Infection with Taura syndrome virus	Never reported
Infection with white spot syndrome virus	Last reported 2020
Infection with yellowhead virus genotype 1	Never reported
Amphibian diseases	
Infection with *Batrachochytrium dendrobatidis*	Last reported 2020
Infection with *B. salamandrivorans*	Never reported
Infection with ranavirus	Last reported 2008

OIE = World Organisation for Animal Health
Note: Aquatic animal diseases that were reportable to OIE in 2020 are those listed in the 2020 OIE *Aquatic Animal Health Code*.

In 2019 and 2020, national disease investigations for aquatic animal species were conducted by the CSIRO Australian Centre for Disease Preparedness (ACDP) to detect or exclude nationally reportable diseases (Figures 3.3 to 3.6). Each investigation may involve a single aquatic animal or multiple aquatic animals.

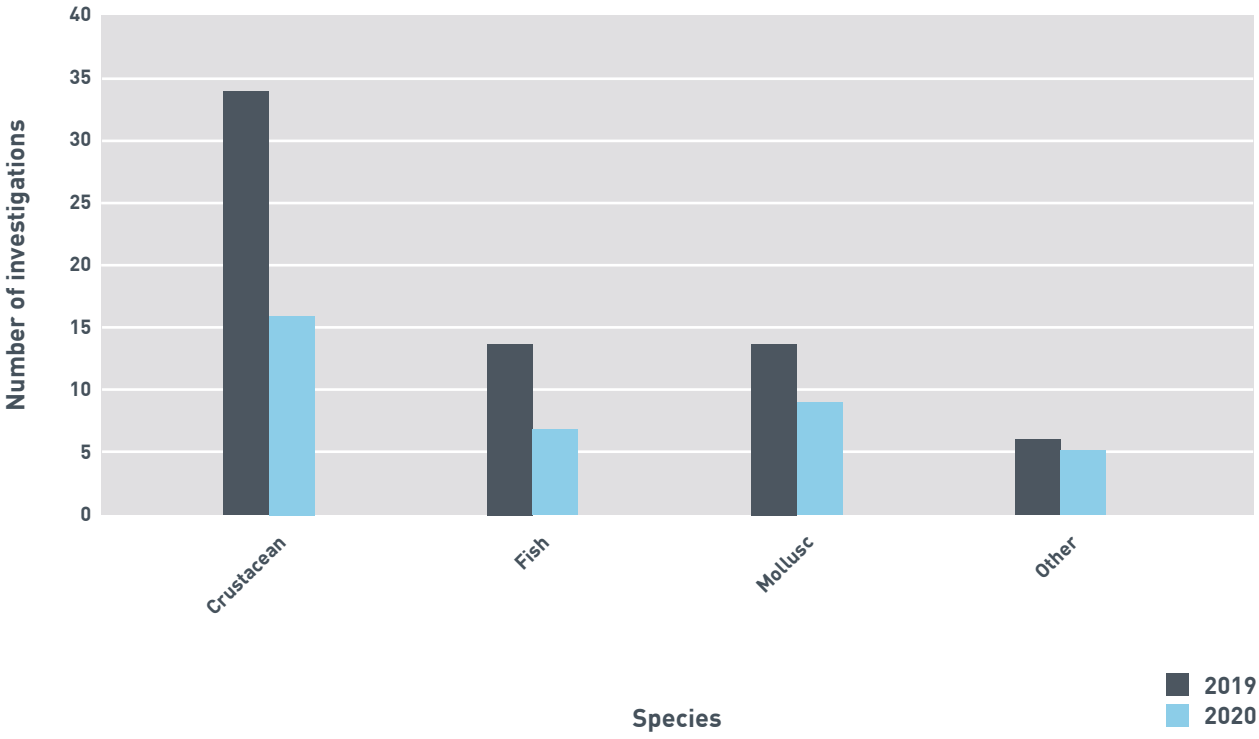


Figure 3.1 Number of investigations of reportable diseases of aquatic animals in 2019 and 2020

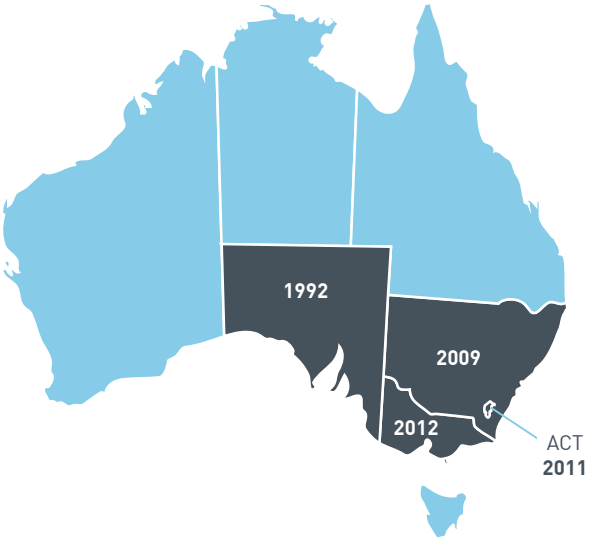
Note: There were fewer investigations of reportable diseases of aquatic animals in 2020 compared to 2019 due to COVID-19 restrictions affecting operations.

Table 3.2 Australia's status for other significant diseases of aquatic animals, 2020

Disease or agent	Status
Finfish diseases	
Channel catfish virus disease	Never
European catfish virus / European sheatfish virus	Never
Grouper iridoviral disease	Never
Infection with *Aeromonas salmonicida* – atypical strains	2018
Infection with *Aeromonas salmonicida* subsp. *salmonicida* (furunculosis)	Never
Infection with *Edwardsiella ictaluri* (enteric septicaemia of catfish)	2014
Infection with *Myxobolus cerebralis* (whirling disease)	Never
Infection with *Renibacterium salmoninarum* (bacterial kidney disease)	Never
Infection with *Yersinia ruckeri* – Hagerman strain (enteric redmouth disease)	Never
Infection with *Piscirickettsia salmonis* (piscirickettsiosis)	Never
Infectious pancreatic necrosis	Never
Infectious spleen and kidney necrosis virus (ISKNV)-like viruses	2020*
Viral encephalopathy and retinopathy	2020
Mollusc diseases	
Infection with *Bonamia* species	2015
Infection with *Marteilia sydneyi*	2020
Infection with *Marteilioides chungmuensis*	Never
Infection with *Mikrocytos mackini*	Never
Infection with ostreid herpesvirus 1 microvariant	2020
Iridoviruses	Never
Crustacean diseases	
Acute hepatopancreatic necrosis disease	Never
Gill-associated virus	2019
Infection with decapod iridescent virus 1	Never
Monodon slow growth syndrome	Never

* The detection was limited to a fish population at a hobbyist breeder's home aquarium.

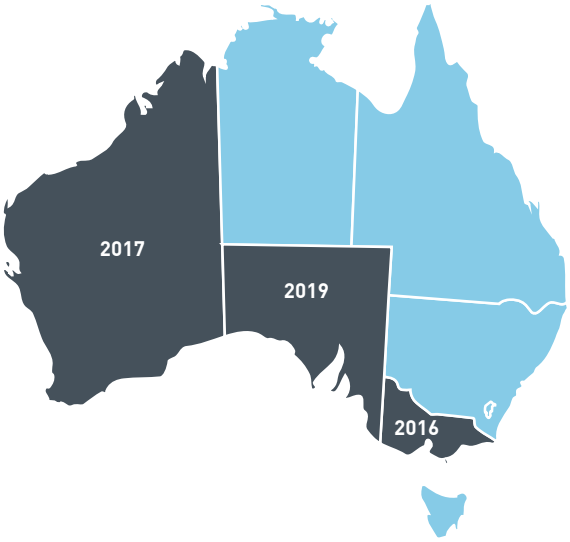
Epizootic haematopoietic necrosis



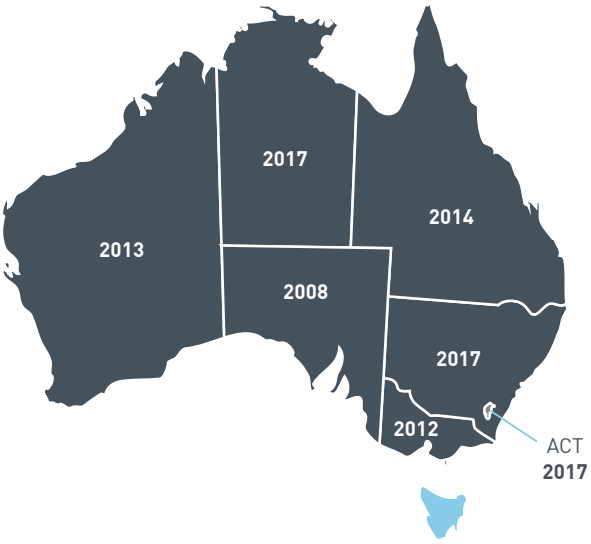
Infection with *Batrachochytrium dendrobatidis*

Infection with abalone herpes virus (abalone viral ganglioneuritis)

Infection with *Bonamia exitiosa*



Infection with *Aphanomyces invadans* (epizootic ulcerative syndrome)



Infectious hypodermal and haematopoietic necrosis

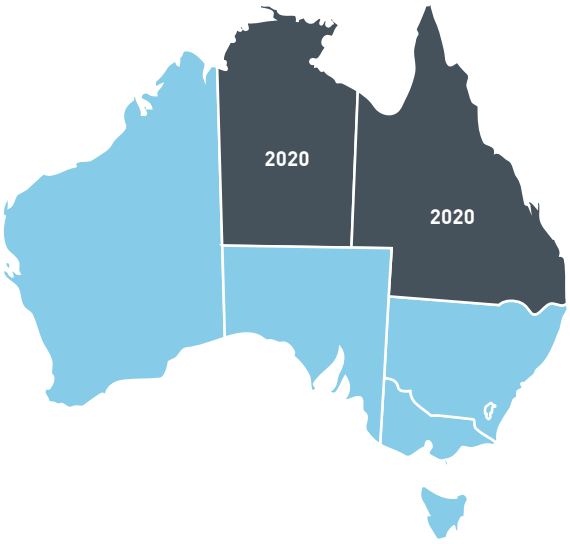


Figure 3.2 Distribution of OIE-listed aquatic animal diseases in Australia

	2019
Infection with white spot syndrome virus	10%
Viral encephalopathy and retinopathy	33%
Red sea bream iridoviral disease	10%
Infection with infectious spleen and kidney necrosis virus	10%
Bacterial kidney disease (*Renibacterium salmoninarum*)	5%
Piscirickettsiosis (*Piscirickettsia salmonis*)	5%
Infectious pancreatic necrosis	5%
Infection with HPR-deleted or HPR0 infectious salmon anaemia virus	5%
Infection with salmonid alphavirus	10%
Viral haemorrhagic septicaemia	5%
Infection with ranavirus	5%

	2020
Red sea bream iridoviral disease	8%
Infection with infectious spleen and kidney necrosis virus	8%
Furunculosis (*Aeromonas salmonicida* subsp. *salmonicida*)	17%
A salmonicida atypical strains	17%
Aeromonas salmonicida – atypical strains	8%
Koi herpesvirus disease	8%
Infectious pancreatic necrosis	8%
Spring viraemia of carp	8%
Enteric septicaemia of catfish (*Edwardsiella ictaluri*)	17%

Figure 3.3 National reportable disease investigations of fish in 2019 and 2020

	2019
Infection with white spot syndrome virus	33%
Infection with yellow head virus genotype 1	10%
Infection with gill-associated virus	10%
Acute hepatopancreatic necrosis disease	4%
Infection with infectious myonecrosis virus	10%
Infection with Taura syndrome virus	2%
Infection with *Hepatobacter penaei*	2%
Infection with decapod iridescent virus 1	2%
Infection with *Enterocytozoon hepatopenaei*	25%
Monodon slow growth syndrome	2%

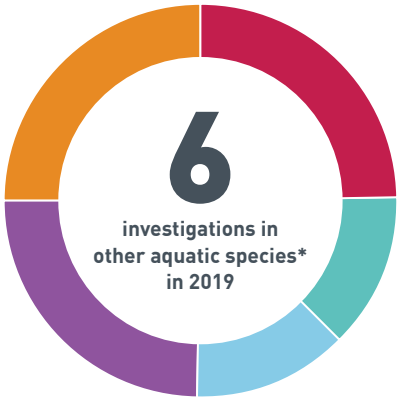
	2020
Infection with white spot syndrome virus	43%
Infection with infectious hypodermal and haematopoietic necrosis virus	26%
Infection with gill-associated virus	26%
Infection with *Enterocytozoon hepatopenaei*	4%

Figure 3.4 National reportable disease investigations of crustaceans in 2019 and 2020

	2019
Abalone viral ganglioneuritis	4%
Infection with *Bonamia exitiosa*	13%
Infection with *Bonamia ostreae*	13%
Infection with *Mikrocytos mackini*	4%
Infection with *Marteilia refringens*	11%
Infection with *Marteilioides chungmuensis*	4%
Infection with *Perkinsus olseni*	20%
Infection with *Perkinsus marinus*	20%
Infection with *Xenohaliotis californiensis*	2%
Ostreid herpesvirus-1 µ variant (OsHV-1 µvar)	7%

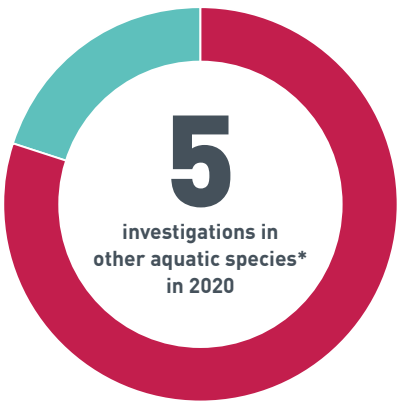
	2020
Abalone viral ganglioneuritis	4%
Infection with *Bonamia exitiosa*	11%
Infection with *Bonamia ostreae*	11%
Infection with *Mikrocytos mackini*	11%
Infection with *Marteilia refringens*	11%
Infection with *Marteilioides chungmuensis*	7%
Infection with *Perkinsus olseni*	22%
Infection with *Perkinsus marinus*	22%

Figure 3.5 National reportable disease investigations of molluscs in 2019 and 2020



	2019
Infection with white spot syndrome virus	25%
Infection with *Enterocytozoon hepatopenaei*	13%
Infection with ranavirus	13%
Furunculosis (*Aeromonas salmonicida* subsp. *salmonicida*)	25%
Aeromonas salmonicida – atypical strains	25%

*Other aquatic animal species include amphibians, porpoises and aquaculture feed



	2020
Infection with white spot syndrome virus	80%
Infection with ranavirus	20%

*Other aquatic animal species include amphibians, porpoises and aquaculture feed

Figure 3.6 National reportable disease investigations of other aquatic species in 2019 and 2020

3.2 Disease events in 2019 and 2020

There were no significant aquatic disease events reported in 2019.

White spot disease

White spot disease (WSD) affected seven prawn farms in southeast Queensland from late 2016 to early 2017. WSD was detected again on two previously-affected prawn farms on the Logan River in April 2020. Clinical signs were observed on the farms, which initiated sample collection and testing. At that time, harvesting on both farms was nearing completion, and all harvested prawns were cooked immediately after harvest, consistent with ongoing biosecurity measures in place within the movement regulated area (MRA) in southeast Queensland which extends from Caloundra to the New South Wales border including Moreton Bay, the Brisbane River and the Logan River (Figure 3.7). The only other farm in operation on the Logan River was not affected by the disease, and completed harvest by end of May 2020.

The detection of white spot syndrome virus (WSSV) on the two farms was followed by detection of the virus in wild crustaceans from northern Moreton Bay in April 2020. This surveillance sampling was part of six-monthly surveillance conducted within the MRA and WSSV in wild crustaceans in the MRA had not been detected since March 2018. However, the same sites in northern Moreton Bay were tested in March 2020 and confirmed positive for WSSV in April 2020.[30]

At the CSIRO ACDP, the WSSV whole genome sequences (WGS) generated from farmed prawns in April 2020 were compared with sequences from prawns farmed in 2016 and a wild crab from northern Moreton Bay in 2017. All WSSV WGS from Queensland shared more than 99% nucleotide similarity. The WGS results suggest that the April 2020 detection of WSSV in farmed prawns and wild crustaceans was not a new incursion but was caused by the same virus strain that had caused the original outbreak from late 2016 to early 2017.

In response to the 2016–2017 outbreak of WSD, Australia initiated a national surveillance program from late 2017 to early 2020, which aimed to provide evidence of national freedom, or alternatively zone freedom, from WSD. The Australian and all state and territory governments contributed to the national program, which surveyed wild prawn populations around Australia from 2017-2020. The national surveillance program covered over 100 000 samples from across Australia, including:

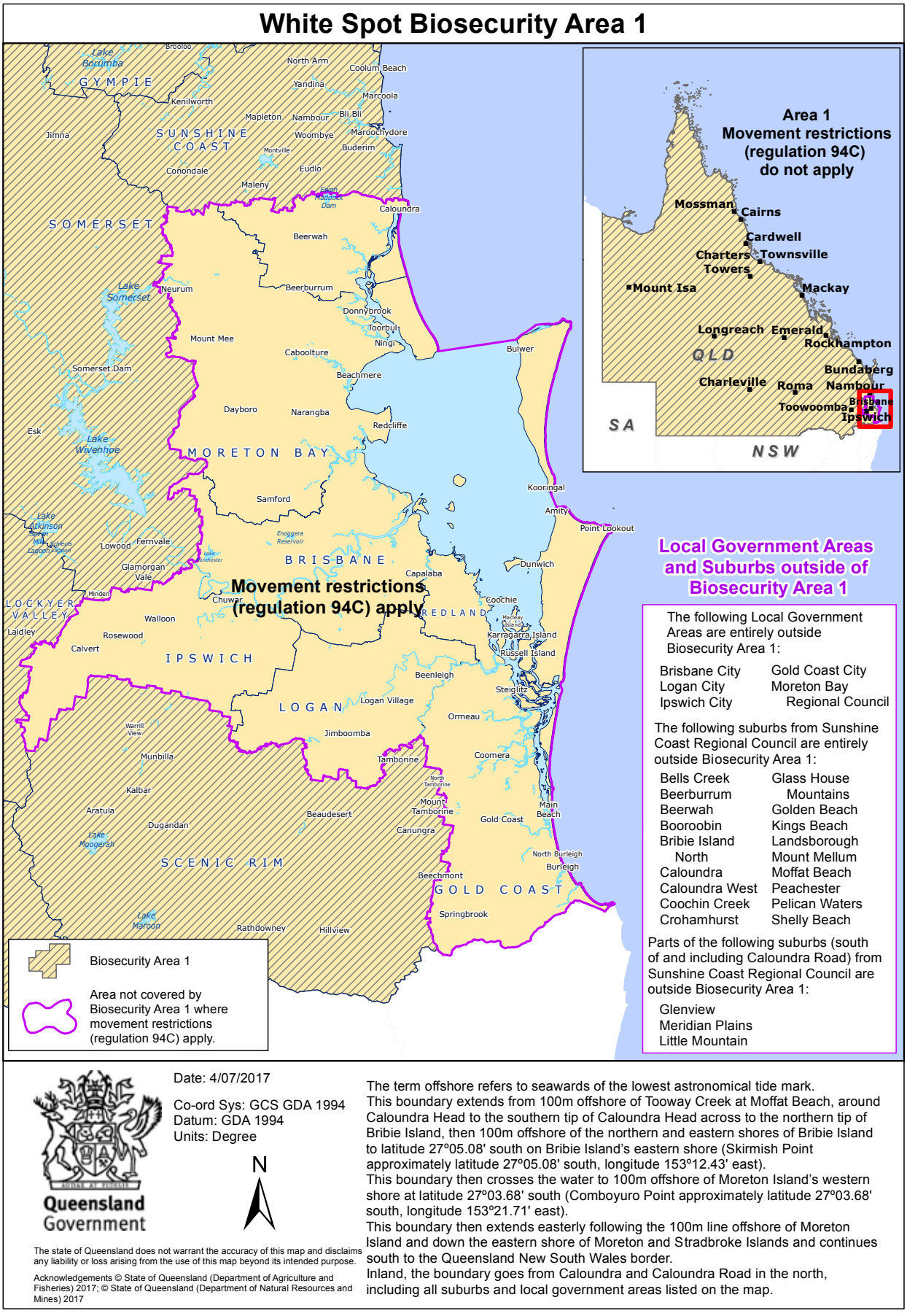
- 21 000 wild crustaceans from 59 sites around Australia;
- 27 000 wild-caught broodstock and post-larvae prior to stocking of farms; and
- 5700 prawns from Queensland prawn farms.

Passive surveillance was carried out on all prawn farms in Australia.

All samples collected from areas outside the MRA returned negative results for WSSV. Following the 2020 detection of WSSV in farmed and wild prawn populations within the MRA, demonstration of national freedom has become unachievable. Instead, the national surveillance program for WSSV has accumulated enough evidence to demonstrate that wild and farmed crustacean populations are free from WSSV in all areas of Australia outside the MRA, which constitutes zone freedom. This zone includes all areas of Australia excluding the MRA in southeast Queensland.

The Aquatic Consultative Committee on Emergency Animal Diseases, which is the national committee providing technical and expert advice to the jurisdiction leading an emergency aquatic animal disease response, has agreed on an approach to maintaining zone freedom from WSSV. This approach includes additional ongoing surveillance requirements at the northern and southern boundaries of the MRA to monitor the natural spread of WSSV in wild crustacean populations. Should the need arise, information on the national surveillance program (2017–2020) and ongoing surveillance measures to maintain zone freedom will be prepared and used to seek formal recognition of zone freedom (e.g. an OIE self-declaration of zone freedom).

30 www.daf.qld.gov.au/business-priorities/biosecurity/animal-biosecurity-welfare/animal-health-pests-diseases/a-z-list-of-significant-animal-pests-and-diseases/white-spot-disease/white-spot-disease-surveillance



Source: Queensland Department of Agriculture and Fisheries

Figure 3.7 Queensland movement regulated area

4

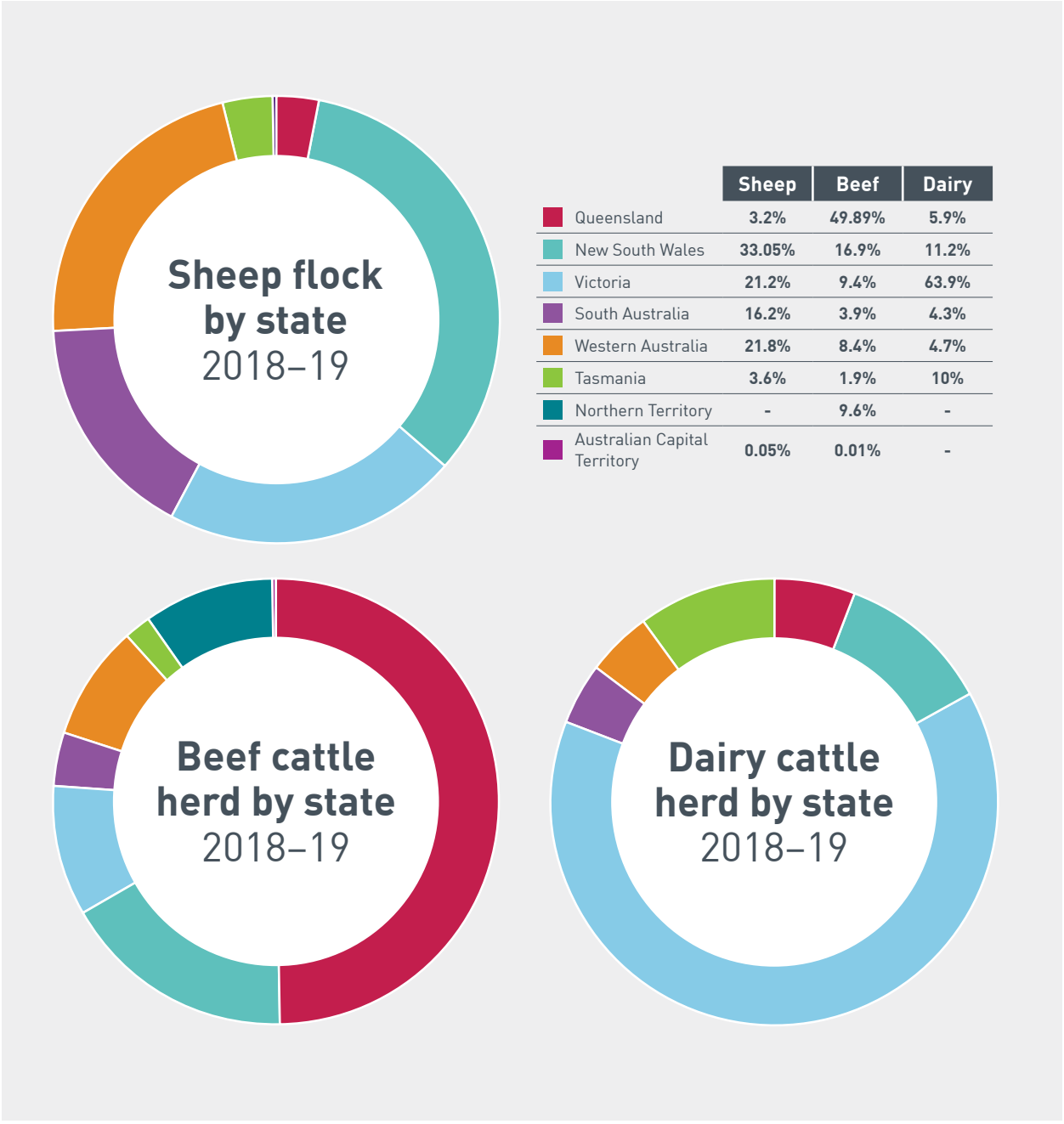
Appendix

4 Appendix A – Livestock and aquatic industries in Australia

Table A1 Sheep and cattle numbers by state, 2018–19*

	Unit	Qld	NSW	Vic.	SA	WA	Tas.	NT	ACT	National
Sheep	'000 head	2 101	22 366	13 948	10 650	14 305	2,352	-	33	65 755
Beef cattle	'000 head	11 156	3 780	2 106	881	1 878	431	2 147	3	22 382
Dairy cattle	'000 head	139	263	1 497	100	111	231	-	-	2 341

Source: Australian Bureau of Statistics



	Sheep	Beef	Dairy
Queensland	3.2%	49.89%	5.9%
New South Wales	33.05%	16.9%	11.2%
Victoria	21.2%	9.4%	63.9%
South Australia	16.2%	3.9%	4.3%
Western Australia	21.8%	8.4%	4.7%
Tasmania	3.6%	1.9%	10%
Northern Territory	-	9.6%	-
Australian Capital Territory	0.05%	0.01%	-

Figure A1 Sheep and cattle numbers by state, 2018–19

*2019–20 figures were not readily available at time of print and will be provided in the 2021 edition.

Table A2 Australian livestock statistics

	Unit	2017–18	2018–19	2019–20[a]
Livestock numbers				
Sheep	'000 head	70 607	65 755	62 700
Beef cattle	'000 head	23 768	22 382	21 074
Dairy cattle	'000 head	2 627	2 341	2 326
Total Cattle	**'000 head**	**26 396**	**24 723**	**23 400**
Pigs	'000 head	2 534	2 319	2 372
Livestock slaughterings				
Sheep	'000 head	8 397	9 730	8 268
Lamb	'000 head	23 432	22 087	20 272
Cattle and calves	'000 head	7 915	8 704	8 699
Pigs	'000 head	5 379	5 315	5 167
Chickens	million	636	653	658
Goats	'000 head	1 937	1 456	1 248
Meat produced[b]				
Mutton	kt (cw)	204	230	208
Lamb	kt (cw)	531	501	482
Beef and veal	kt (cw)	2 238	2 352	2 372
Pork	kt (cw)	417	414	403
Poultry	kt (cw)	1 193	1 240	1 247
Goat meat	kt (cw)	28	20	19
Livestock products				
Wool[c]	kt (gr. eq.)	422	379	355
Milk[d]	ML	9,325	8,793	8,784
Eggs	million dozen	360	355	366
Meat exports				
Mutton	kt (sw)	177	197	182
Lamb	kt (sw)	280	292	280
Beef and veal	kt (sw)	1 122	1 222	1 290
Pig meat	kt (sw)	35	33	29
Chicken meat	kt (sw)	37	41	43
Goat meat	kt (sw)	25	18	17
Kangaroo meat	kt (sw)	3	3	2
Camel meat	kt (sw)	1	1	2

Cont'd

	Unit	2017–18	2018–19	2019–20[a]
Live animal exports				
Live sheep[e]	'000 head	1 975	925	1 089
Live feeder/slaughter cattle[f]	'000 head	885	1 125	1 237
Live breeder cattle[g]	'000 head	96	143	141
Live goats	'000 head	19	19	16
Live camels	head	2 584	1 811	352
Live buffalo	head	6 166	11 240	4 285
Gross value of livestock production				
Sheep[h]	$m	769	905	1,215
Lamb[h]	$m	2 943	3 151	3 887
Cattle and calves[h,i]	$m	10 752	11 184	13 101
Pigs[h]	$m	1 146	1 222	1 528
Poultry	$m	2 683	2 775	2 853
Goats	$m	138	127	168
Cattle exported live[i]	$m	1 268	1 644	1 878
Sheep exported live[e]	$m	259	121	157
Goats exported live	$m	5	7	6
Wool[c]	$m	4 481	4 390	3 065
Milk[k]	$m	4 270	4 374	4 603
Eggs	$m	828	833	871

a ABARES estimate.
b Includes carcase equivalent of canned meats.
c Includes shorn wool (includes crutching), dead and fellmongered wool, and wool exported on skins.
d Includes the whole-milk equivalent of farm cream intake.
e Includes breeding stock.
f Includes buffalo.
g Includes dairy cattle and buffalo.
h Excludes skin and hide values.
i Includes dairy cattle slaughtered.
j Includes all bovine for feeder/slaughter, breeding and dairy purposes.
k Milk intake by factories and valued at the farm gate.
Source: Australian Bureau of Statistics.

Table A3 Australian fisheries production

	Unit	2016–17	2017–18	2018–19
Volume of fisheries production				
Tuna	kt	12	12	12
Salmonids[a]	kt	53	61	57
Other fish	kt	114	121	116
Prawns	kt	26	23	25
Rock lobster	kt	10	11	10
Crab	kt	5	5	4
Other crustaceans	kt	1	1	1
Abalone	kt	4	4	4
Scallop	kt	6	8	7
Oyster	kt	12	9	9
Squid	kt	2	3	2
Other molluscs	kt	5	5	6
Other nei*	kt	4	3	5
Total	**kt**	**255**	**266**	**257**
Value of fisheries production				
Tuna	$m	148	160	161
Salmonids[a]	$m	756	855	827
Other fish	$m	508	539	580
Prawns	$m	396	361	373
Production not included elsewhere[b]	$m	662	713	701
Crab	$m	57	60	57
Other crustaceans	$m	25	28	27
Abalone	$m	177	195	165
Scallop	$m	24	25	16
Oyster	$m	112	102	106
Squid	$m	15	16	14
Other molluscs	$m	103	85	106
Other nei*	$m	75	38	84
Total	**$m**	**2 764**	**3 020**	**3 058**
Exports of fisheries production				
Edible - volume[c]	kt	51	51	46
Edible - value[c]	$m	1 333	1 495	1 444
Non-edible - value	$m	103	81	85

a Includes salmon and trout production.

b Includes aquaculture production not elsewhere specified because of confidentiality restrictions. In Victoria, this includes warmwater finfish, ornamental fish, other shellfish, shrimps and aquatic worms.

c Excludes live tonnage but includes live value.

* Not elsewhere included

Sources: ABARES; Australian Fisheries Management Authority; Australian Bureau of Statistics; Department of Fisheries, Western Australia; Department of Primary Industries, New South Wales; Department of Primary Industries, Parks, Water and Environment, Tasmania; Fisheries Queensland, Department of Agriculture, Fisheries and Forestry; Fisheries Victoria, Department of Environment and Primary Industries; Northern Territory Department of Primary Industry and Fisheries; Primary Industries and Regions, South Australia; South Australian Research and Development Institute

Table A4 Australian aquaculture production[a,b]

	Unit	2016–17	2017–18
Volume			
Fish			
Salmonids[c]	kt	53	61
Tuna	kt	8	8
Silver perch	kt	0	0
Barramundi	kt	4	6
Other[d]	kt	3	3
Total	**kt**	**68**	**79**
Crustaceans			
Prawns	t	4 624	4 205
Yabby	t	29	51
Marron	t	55	66
Redclaw	t	65	49
Total	**t**	**4 774**	**4 371**
Molluscs			
Edible oyster	kt	12	9
Pearl oyster	kt	-	-
Abalone	kt	1	1
Blue mussel	kt	4	4
Total	**kt**	**17**	**14**
Production not included elsewhere[e]	kt	4	1
Total (all categories)	**kt**	**94**	**98**
Value			
Fish			
Salmonids[c]	$m	756	855
Tuna	$m	115	126
Silver perch	$m	4	4
Barramundi	$m	41	54
Other[d]	$m	38	48
Total	**$m**	**954**	**1 087**
Crustaceans			
Prawns	$m	86	81
Yabby	$m	1	1
Marron	$m	2	3
Redclaw	$m	2	1
Total	**$m**	**90**	**86**

Cont'd

	Unit	2016–17	2017–18
Molluscs			
Edible oyster	$m	112	102
Pearl oyster	$m	70	53
Abalone	$m	34	44
Blue mussel	$m	12	12
Total	**$m**	**229**	**209**
Production not included elsewhere[e]	$m	74	35
Total (all categories)	**$m**	**1 347**	**1 417**

a 2018–19 figures were not readily available at time of print and will be provided in the 2021 edition.

b Excludes hatchery production, crocodiles, microalgae and aquarium worms.

c Includes salmon and trout production.

d Includes eel, other native fish and aquarium fish.

e Includes aquaculture production not elsewhere specified because of confidentiality restrictions. In Victoria, this includes warmwater finfish, ornamental fish, other shellfish, shrimps and aquatic worms.

Sources: ABARES; Australian Fisheries Management Authority; Department of Fisheries, Western Australia; Department of Primary Industries, New South Wales; Department of Primary Industries, Parks, Water and Environment, Tasmania; Fisheries Queensland, Department of Agriculture, Fisheries and Forestry; Fisheries Victoria, Department ofEnvironment and Primary Industries; Northern Territory Department of Primary Industry and Fisheries; Primary Industries and Regions, South Australia; South Australian Research and Development Institute

ACRONYMS AND ABBREVIATIONS

AAHL	Australian Animal Health Laboratory
ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ABLV	Australian bat lyssavirus
ACDP	Australian Centre for Disease Preparedness
ACT	Australian Capital Territory
AHA	Animal Health Australia
AHB	Asian honey bee
AHiA	Animal Health in Australia
AI	avian influenza
AIV	avian influenza virus
AMR	antimicrobial resistance
APMV	avian paramyxovirus
APY	Anangu Pitjantjatjara Yankunytjatjara
ASF	African swine fever
BICON	Biosecurity Import Conditions
BSE	bovine spongiform encephalopathy
BTV	bluetongue virus
CDNA	Communicable Diseases Network Australia
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CVO	Chief Veterinary Officer
FMD	foot-and-mouth disease
FREPA	Free Range Egg and Poultry Australia
FSANZ	Food Standards Australia New Zealand
HeV	Hendra virus
HPAI	highly pathogenic avian influenza
JD	Johne's disease
LEADDR	Laboratories for Emergency Animal Disease Diagnosis and Response
MRA	movement regulated area
NABRDES	National Animal Biosecurity Research, Development and Extension Strategy

NAIWB	National Avian Influenza Wild Bird
NAMP	National Arbovirus Monitoring Program
NAQS	Northern Australia Quarantine Strategy
NBPSP	National Bee Pest Surveillance Program
NBRT	National Biosecurity Response Team
ND	Newcastle disease
NLIS	National Livestock Identification System
NMG	National Management Group
NRS	National Residue Survey
NSHMP	National Sheep Health Monitoring Project
NSW	New South Wales
NWS	New World screw-worm fly
OIE	World Organisation for Animal Health
OWS	Old World screw-worm fly
PCR	polymerase chain reaction
PIC	property identification code
QA	quality assurance
RAWS	Regional Animal Welfare Strategy
SE	*Salmonella* Enteritidis
SA	South Australia
SWFSPP	Screw-Worm Fly Surveillance and Preparedness Program
TRACE	Tracking Animal Certification for Export
TSE	transmissible spongiform encephalopathy
TSEFAP	Transmissible Spongiform Encephalopathies Freedom Assurance Project
WGS	whole genome sequence
WHA	Wildlife Health Australia
WNS	white-nose syndrome
WSD	white spot disease
WSSV	white spot syndrome virus
WTO	World Trade Organization

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