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Department of Agriculture,
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National Lumpy Skin Disease Action Plan Progress Report 4 August to October 2023

Biosecurity Animal Division



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Acknowledgement of Country

We acknowledge the Traditional Custodians of Australia and their continuing connection to land and sea, waters, environment and community. We pay our respects to the Traditional Custodians of the lands we live and work on, their culture, and their Elders past and present.

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Introduction

The National Lumpy Skin Disease (LSD) Action Plan (the Action Plan) was released on 13 October 2022 and sets out national priorities for actions to strengthen Australia's preparedness for an incursion of LSD. It was developed in partnership with governments, industries and other stakeholders. It is envisaged that the Action Plan will be implemented over a period of at least three years.

Of the 27 activities in the Action Plan, **3 have been completed**, and **23 are underway**. This report provides an overview of each activity's status, priority and next steps. A prioritisation matrix is provided below.

Table 1 Prioritisation matrix

Criteria	High priority (one or more of the following)	Medium priority (one or more of the following)	Low priority (all of the following)
Urgency	Activity is highly time critical.	Activity is less time critical.	Activity is not time critical.
Importance of project	Activity has a high impact on Australia's preparedness for LSD.	Activity has a moderate impact on Australia's preparedness for LSD.	Activity has a lower level of impact on Australia's preparedness for LSD.
Risks to program delivery if not achieved	If not achieved, activity would have a high impact on the success of the program of work or has a high level of dependencies with other activities.	If not achieved, activity would have a moderate impact on the success of the program of work or has some level of dependencies with other activities.	If not achieved, activity would have a low impact on the success of the program of work and has limited dependencies with other projects.

Note: Activities have been prioritised based on urgency and importance of the project and the risks to the success of the National LSD Action Plan program if the project is not delivered successfully.

Objective 1: International engagement

Table O1 Strengthen collaboration and engagement within the region to strategically address the risks of LSD.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
1.1. Support Indonesia's LSD response	<p>Lead Department of Agriculture, Fisheries and Forestry (DAFF), Department of Foreign Affairs and Trade (DFAT)</p> <p>Collaborators Meat & Livestock Australia (MLA), the Australian Centre for Disease Preparedness (ACDP), overseas partners</p>	This activity aims to ensure Indonesia receives ongoing financial and technical support for their LSD outbreak response to help control and contain the spread of the disease in alignment with the needs identified by the Indonesian Government.	On track	<p>High priority</p> <p>Support for distribution of vaccines and equipment</p> <ul style="list-style-type: none"> • DFAT has provided 435,000 LSD vaccines to the Indonesian government. • In 2023 DAFF has committed to providing Indonesia with an additional 1 million doses of LSD vaccine, as well as syringes and needles. 500,000 doses were delivered to Indonesia in May 2023. • DAFF has provided a grant of \$1.226 million to fund an Australian Livestock Export Corporation Ltd (LiveCorp) project to partially reimburse the cost of foot-and-mouth disease (FMD) and LSD vaccination in buffer zones surrounding feedlots and facilities across Indonesia and support the welfare of smallholders within these communities. • DFAT has purchased personal protective equipment and disinfectant for the Indonesian response. <p>Laboratory capacity</p> <ul style="list-style-type: none"> • DAFF has provided a grant of \$1.048 million to the ACDP to deliver diagnostics and capacity building support to Indonesian government laboratories. The primary objective of the Regional Emerging Disease Support (REDS) project is to assist with the implementation and delivery of external quality assurance (QA) programs for LSD. REDS has provided refresher tissue culture training to staff at the Indonesian Disease Investigation Centre Wates laboratory (DIC Wates) with technical aspects delivered virtually over 5 weeks in July and August 2023 followed by practical demonstration of techniques at DIC Wates in early September 2023. Tissue culture training was augmented via the purchase of cell lines and reagents. In September staff at DIC Wates assisted with preparation of standardised positive control material (network quality control or NQC) for distribution to the Indonesian veterinary laboratory network (IVLN). NQC has passed all quality testing and is ready for distribution. Staff have received training in NQC data analysis supported by use of 'mock' data to practise NQC analysis and report preparation. • REDS has been extended through to 30 June 2024 and will deliver refresher virtual training for tissue culture followed by an in-country practical demonstration. Training will commence for preparation of NQC for the key 	<p>Support for distribution of vaccines and equipment</p> <ul style="list-style-type: none"> • The Australian Government (DAFF/DFAT) is working with Indonesian Ministry of Agriculture (MoA) on further support as requested. This includes the provision of additional doses of vaccines and technical support through the Australia Indonesia Health Security Partnership (AIHSP). • DAFF can confirm that a further 500,000 doses of LSD vaccine as well as syringes and needles will be delivered to Indonesia in December 2023. <p>Laboratory capacity</p> <ul style="list-style-type: none"> • NQC material is scheduled for distribution in December with testing of the material to commence in January 2024. A briefing meeting for the IVLN will be held in early December with the support of the Indonesian Directorate General of Livestock and Animal Health, to socialise the concept of the NQC program with the IVLN. Training and preparation for LSD proficiency testing scheme will commence in January 2024. • DAFF is working with the Indonesian Quarantine Authority (IQA) to develop a laboratory cooperation

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
				<p>serology and PCR diagnostic assays. DIC Wates will collect and store diagnostic samples that can be used for this purpose. Training will be provided in NQC data analysis using synthesised data provided by ACDP.</p> <p>Technical assistance</p> <ul style="list-style-type: none"> DFAT has provided \$2.2 million for technical assistance for a range of support including disease surveillance and epidemiology, field services and biosecurity surveillance, emergency management and operations, support for national/sub-national project teams and monitoring and evaluation. DFAT's AIHSP partners directly with Indonesia's MoA to strengthen health security systems and build One Health capabilities. This includes providing technical expertise, governance support and strategic planning to supporting Indonesia's disease control and surveillance efforts. <p>Other technical and advisory support</p> <ul style="list-style-type: none"> \$1.4 million has been allocated to support a collaborative project with the Food and Agriculture Organization of the United Nations (FAO) Indonesia office to deliver quarantine and emergency animal disease (EAD) response and control efforts in Indonesia. In July 2023, a DAFF officer commenced a secondment to FAO to support this project (Activity 1.3). A workplan has been developed in collaboration with the MoA and activities commenced. Indonesian quarantine officers are being trained through the DAFF-funded Biosecurity Training Centre (BTC) at Charles Sturt University (CSU) (Activity 1.2). 	<p>and capacity building program for IQA laboratories and staff.</p> <p>Technical assistance</p> <ul style="list-style-type: none"> Support for improved farm biosecurity and subnational delivery of activities is being secured through an agreement with a non-government organisation based in Indonesia. This is expected to extend the coverage and range of support delivered on the ground in Indonesia. <p>Other technical and advisory support</p> <ul style="list-style-type: none"> FAO is working closely with the MoA to finalise a work plan for a technical support program to progress LSD and FMD control measures. The program will conclude on 31 March 2024. A fourth and final stage of biosecurity training will be undertaken in-country by CSU with mentored support for dissemination of the program to over 100 Indonesian quarantine officers. This activity will occur in the 2023 calendar year.
1.2. Build LSD preparedness, technical and diagnostic capability and surveillance in near neighbouring countries	<p>Lead DAFF</p> <p>Collaborators Overseas partners, DFAT, Agriculture Victoria (AgVic)</p>	This activity seeks to build on existing relationships with Papua New Guinea (PNG)'s National Agriculture Quarantine and Inspection Authority (NAQIA) and Timor-Leste's Ministry of	On track	<p>High priority</p> <ul style="list-style-type: none"> DAFF has funded LSD testing capacity in Timor-Leste, with both PCR nucleic acid testing and Enzyme Linked Immunosorbent Assay (ELISA) test capability now established in-country through ACDP. DAFF, Nossal Institute and NAQIA have finalised a rapid risk assessment for LSD for PNG, to focus awareness and surveillance activities. NAQIA has developed LSD and FMD preparedness work plans, and DAFF is supporting a number of activities. An advanced LSD/FMD field diagnostic testing, sampling skills and vaccination workshop was delivered in conjunction with an FMD scenario exercise from 5 to 9 June 2023. During the workshop, LSD awareness materials were launched with support from the DFAT-funded Pacific Horticultural and Agricultural Market Access Plus (PHAMA Plus). PNG has developed an FMD vaccination plan, with DAFF technical support. 	<ul style="list-style-type: none"> The development of a vaccination plan for LSD for PNG, including cold chain arrangements for emergency animal vaccines, is being supported by DAFF. Development and delivery of training for PNG's quarantine operations officers, to mitigate the risk of LSD and other priority diseases is planned for early 2024.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
		Agriculture and Fisheries (MAF) to improve their LSD preparedness, technical and diagnostic capability, and surveillance.		<ul style="list-style-type: none"> • PNG and Timor-Leste are now part of the DAFF-funded LSD regional vaccine supply agreement, giving these countries rapid access to an initial supply of quality LSD vaccines for a disease response should this be required in the future. DAFF is currently supporting the establishment of suitable vaccine cold chain arrangements. • In June 2023, a DAFF veterinarian joined NAQIA in a survey of PNG's southern border (Western Province) to assess risk pathways for LSD and other priority animal diseases. • DAFF funded a Quarantine Capacity Building Project with Timor-Leste, in collaboration with the BTC. This project ran from January to July 2023. A 5-day in country needs assessment was conducted in January 2023 in Timor-Leste and in March 2023 in Indonesia to quantify the scope of work to be undertaken. A 10-day residential 'train the trainer' course was conducted for 10 quarantine officers from Timor-Leste at the BTC in April 2023, then during a follow-up workshop in Timor-Leste in July 2023 these officers trained their colleagues in recognising key animal disease including LSD, and in recognising risk commodities at the border. Indonesian officials participated in 'train the trainer' training programs at the BTC in June 2023. • A DAFF-funded awareness campaign and surveillance activity for LSD and other diseases was conducted from March to July 2023 in three border municipalities of Timor-Leste. Awareness materials were used as the focus of a series of village meetings, followed by active surveillance for these diseases. Over 1000 cattle were sampled across 98 villages. Data has been analysed and will be published by Timor-Leste's MAF. • DAFF has funded the Northern Territory's Berrimah Veterinary Laboratory to establish abattoir and sentinel surveillance for LSD and other priority animal diseases in Timor-Leste, in collaboration with MAF. • DAFF conducted a scoping exercise from 23-27 October 2023 to understand PNG's quarantine operations training needs. DAFF officers joined colleagues from PNG to tour the airport, port, mail centre and approved quarantine facilities in Port Moresby. A training program will be developed to mitigate the risk of LSD and other priority diseases, to be delivered in 2024. • DFAT has been working with AgVic in Timor-Leste to improve laboratory capacity and disease surveillance efforts. An animal health surveillance system based on the EpiCollect platform has been deployed and is now in use which increases the diseases surveillance capacity for Timor-Leste. An animal disease testing laboratory was also installed in Dili in 2022 to increase the capacity to use modern molecular testing methodologies. 	

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
1.3. Strengthen relationships in South-East Asia	Lead DAFF, DFAT Collaborators Relevant state and territory governments, overseas partners	This activity includes establishing an Office of the Chief Veterinary Officer presence in northern Australia, led by the Australian Deputy Chief Veterinary Officer (Deputy ACVO).	On track	High priority <ul style="list-style-type: none"> In November 2022, DAFF engaged with an Indonesian government delegation in Canberra on a range of topics highlighting Australian and Indonesian biosecurity co-operation. The meeting included senior parliamentarians and decision-makers on agriculture policies and laws from Indonesia's Commission IV, as well as key Indonesian ministry stakeholders for DAFF, including the Director General of Livestock and Animal Health in the Indonesian MoA. A DAFF officer has been seconded to FAO and arrived in Indonesia in July 2023. This officer will provide a ready conduit between Indonesian and Australian experts. The project represents a step up in integrating Indonesian, Australian and other international support efforts in what will be a long-term response. The Office of the Chief Veterinary Officer has established a presence in northern Australia, led by the Australian Deputy ACVO. 	<ul style="list-style-type: none"> DAFF is continually seeking to build relationships in South-East Asia, including promoting engagement around LSD and other important animal health issues. A DAFF officer will participate in the 4th LSD Coordination Meeting for South-East Asia to be held during 28-29 November 2023.
1.4. Engage in international and regional fora	Lead DAFF Collaborators Overseas partners	This activity involves Australia's ongoing engagement and contribution to international and regional fora on LSD.	On track	Medium priority <ul style="list-style-type: none"> DAFF attended the 12th FAO/World Organisation for Animal Health (WOAH) Regional Steering Committee Meeting of the Global Framework for the progressive control of Transboundary Animal Diseases (GF-TADs) for Asia and the Pacific in February 2023. Australia's contributions to the GF-TADs Regional Strategy advocated that it captures diseases of significant concern to Australia including LSD and FMD. DAFF also advocated that the strategy focuses on addressing transboundary animal diseases at their source and boosts prevention and preparedness capabilities in LSD- and FMD-free countries at significant risk of an incursion e.g. Timor-Leste and PNG. 	<ul style="list-style-type: none"> This is an ongoing activity with Australian representatives regularly attending meetings of intergovernmental organisations, focused on LSD control and elimination in the Asia Pacific region. Australian representatives will continue to engage in international and regional fora relating to the management, control and prevention of LSD.

Objective 2: Border biosecurity and trade

Table O2 Augment industry-government collaboration and communication on the border biosecurity risks of LSD to Australia and strategically address technical market access barriers.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
2.1. Review import policy and LSD risk pathways	<p>Lead DAFF</p> <p>Collaborators Peak industry organisations</p>	This activity will include undertaking robust science-based risk analyses for the import of products from LSD-affected countries to ensure the risk of LSD is managed and achieves Australia's appropriate level of protection.	On track	<p>High priority</p> <ul style="list-style-type: none"> In response to the spread of LSD in South-East Asia, DAFF has reviewed import permits for products from LSD affected countries and suspended those of concern. A review of the risk of entry of LSD from non-regulated pathways has been undertaken (Activity 5.1.a). In June 2023, DAFF published a draft review for public consultation of Australia's current entry requirements for LSD in fresh beef (skeletal muscle) and beef products. This draft review proposed that there is no need on biosecurity grounds to certify country freedom from LSD where fresh beef has been derived exclusively from bovine skeletal muscle from approved countries. Stakeholder feedback on the review has been received. 	<ul style="list-style-type: none"> Reviewing import policy is an ongoing priority and DAFF maintains contemporary science and risk-based import policies. DAFF is actively considering its import policy settings for a range of commodities by regarding the available science and nature of the biosecurity risks. The review of Australia's current entry requirements for LSD in fresh beef is expected to be completed by the end of 2023. The review of the import policy for dairy products for human consumption is expected to be finalised in early 2024.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
2.2. Develop a strategic approach to minimising export trade disruptions	<p>Lead DAFF</p> <p>Collaborators DFAT, the Australian Livestock Exporters' Council, LiveCorp, MLA, other industry groups, state and territory governments</p>	This activity will take a strategic approach to minimising disruptions to trade by analysing which export markets and products would be affected if there is an LSD incursion in Australia.	On track	<p>High priority</p> <ul style="list-style-type: none"> In consultation with industry, and state and territory governments, DAFF finalised the LSD trade preparedness strategy. This strategy identifies priorities to mitigate trade losses that could result from an outbreak of LSD. DAFF has commenced implementing the LSD trade strategy, which included a comprehensive review of current export certification across multiple commodities to identify certificates that do not align with internationally recognised scientific standards. DAFF, in consultation with industry, has identified key priorities for engagement to pre-emptively mitigate these trade risks, and has already progressed this work with several markets. Whilst trading partner reactions cannot be anticipated in the event of an LSD incursion, to date approximately \$200 million worth of exports previously at risk could now continue without disruption. Consultation with jurisdictions is underway to clarify and promote consistency in national zoning approaches to minimise disruptions to international trade in the event of an EAD. A virtual workshop will be held in December 2023 to facilitate these discussions. Trade in live cattle exports has been maintained to key regional export markets following temporary disruptions related to concerns over Australia's LSD status. 	<ul style="list-style-type: none"> DAFF continues to make positive progress in accordance with the identified priorities. This includes pre-emptively identifying certification where animal health statements could better align with science-based recommendations. This is an ongoing, high priority activity with regular consultation with key industry groups. DAFF is reviewing existing EAD materials to identify gaps for preparedness. This includes the preparation of communication 'toolkits' to ease burden if these diseases are detected in Australia.

Objective 3: Diagnostic capability and capacity

Table O3 Ensure that Australia’s national diagnostic network provides reliable LSD testing capability and capacity.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
3.1. Improve national and regional LSD diagnostic capability and capacity	<p>Lead ACDP, Laboratories for Emergency Animal Disease Diagnosis and Response (LEADDR)</p> <p>Collaborators DAFF</p>	<p>National testing capability for LSD will be transferred from ACDP to all state and territory government laboratories through the existing LEADDR network. Regional testing capacity is also being supported by ACDP (Activity 1.2).</p>	On track	<p>High priority</p> <ul style="list-style-type: none"> In early March 2023, a report on potential materials for the network quality control (NQC) for LSD testing (PCR) and a schedule for the roll-out of serological capabilities to LEADDR laboratories was supplied to DAFF. A permit to transfer inactivated proficiency testing materials to LEADDR has been approved by DAFF. This will allow proficiency testing to be undertaken by LEADDR. Under a whole of government EAD preparedness program, Victoria (Vic) is strengthening its laboratory capacity for both rapid and sustained responses to disease outbreaks. NQC material for LSD testing has been developed and transferred to LEADDR in May 2023 to support QA for LSD PCR amongst LEADDR laboratories. LSD positive serum for NQC of serological testing (ELISA) has been sourced. An import permit application for the Innovative Diagnostics Capripox ELISA kit has been submitted to allow for the importation and distribution to LEADDR laboratories. A series of laboratory workshops and practical exercises, named Exercise Waterhole, are being held from September to November 2023, to assess the ability of Australia’s laboratory network to respond to an outbreak of LSD while also responding to other animal disease threats. These exercises will assess the effectiveness of the information management systems currently in use in Australia and provide opportunities for improvement in laboratory capacity and capability. 	<ul style="list-style-type: none"> LEADDR are submitting NQC results with the aim of harmonising LSD PCR testing within the network. Testing for the first round of capripox PCR Proficiency Testing has concluded and the report is currently pending finalisation.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
3.2. Improve the diagnostic testing options at ACDP	Lead ACDP Collaborators DAFF	<p>There are a range of diagnostic testing options available for LSD at ACDP. Despite this, the development of new and improved diagnostic tests is important for detecting and managing an LSD incursion in alternative ways and progressing research.</p>	On track	<p>Medium priority</p> <ul style="list-style-type: none"> Negative samples to support development of serological tests (ELISA) in Australian animals have been collected. A project at ACDP on LSD whole genome sequencing database and workflow development has been finalised. ACDP now has access to robust and repeatable whole genome sequencing procedures for timely LSD virus (LSDV) detection and characterisation. After securing the appropriate regulatory approvals, ACDP participated in an international capripox (inactivated) proficiency testing round for serology and molecular diagnostic workflows in July 2023. An immunohistochemical (IHC) staining protocol to identify LSDV in tissues using rabbit antibodies has been completed. This successfully highlighted LSDV in infected/positive control fixed tissue sections. The antibodies also successfully highlighted sheep pox and goat pox viruses in appropriate fixed samples. Commercialisation of an indirect ELISA for LSDV is underway. A commercial partner has been secured, relevant material has been transferred and development of a beta kit <i>is progressing</i>. Verification of virus isolation methods for LSDV using cell culture is <i>continuing</i>. A virus neutralisation test for LSDV has been implemented and is undergoing verification. 	<ul style="list-style-type: none"> Further collection of negative samples through DAFF's Northern Australian Quarantine Strategy (NAQS) will occur to support development of serological tests (ELISA). A series of cell lines have been established for the production of monoclonal antibodies against the LSDV <i>P32 antigen</i>. Preliminary testing of 12 different cell lines <i>by Western blotting</i> and an IHC staining protocol has been undertaken, with <i>several</i> showing promise. Further purification of <i>two of these</i> cell lines <i>have been completed and production of monoclonal antibody is currently underway</i>. <i>Once the antibodies are purified</i>, further rounds of IHC to optimise the test components and protocol will be undertaken. ACDP <i>has utilised its international networks to obtain</i> a recombinant, field relevant strain of LSDV to support <i>ongoing</i> preparedness activities.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
3.3. Explore point-of-care LSD testing	<p>Lead ACDP, the Sub-Committee on Animal Health Laboratory Standards (SCAHLs) and the Animal Health Committee (AHC)</p> <p>Collaborators DAFF and state and territory governments</p>	This activity will explore the development and use of novel point-of-care (POC) tests to screen for potential LSD cases during an outbreak situation.	On track	<p>Medium priority</p> <ul style="list-style-type: none"> The AHC POC Testing Working Group was established in 2021 to examine national policy issues related to POC testing for both notifiable and endemic diseases. DAFF engaged a consultant to support the AHC working group in 2022. A broad range of stakeholder consultation was undertaken covering technical, operational and policy issues relating to the use of POC testing in Australia for all animal diseases. Their final report, including recommendations, was submitted to AHC in January 2023. The AHC POC testing working group will consider the findings of the report. New South Wales (NSW) have developed capacity to undertake POC testing for LSDV in the event of an outbreak using portable PCR machines. Vic is developing capacity to undertake POC testing for LSDV in the event of an outbreak. On behalf of jurisdictional government and industry stakeholders, ACDP is undertaking assessment of LSD POC diagnostics suitable for field deployment. Queensland's (QLD) Department of Agriculture and Fisheries (DAF) is investigating in-field POC test for LSDV, working in collaboration with the Commonwealth Scientific and Industrial Research Organisation (CSIRO). 	<ul style="list-style-type: none"> Victoria has developed several loop mediated isothermal amplification (LAMP) POC primer sets for a test directed against LSD. They have been trialled against clinical LSD samples in Shimla, India with success. The selected primer set will now be further developed to increase its speed and is due to be taken to Thailand National Vet Lab in mid-2024 for validation using their stored clinical samples. South Australia (SA) is further developing their capacity to undertake POC testing, by increasing the number of LAMP testing machines. They are also considering undertaking exercises to test potential uses of the tests during EAD responses in the future.

Objective 4: Surveillance

Table O4 Optimise government and industry investment in LSD surveillance.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
4.1.a. Develop a national LSD surveillance strategy	Lead AHC, Animal Health Australia (AHA) Collaborators DAFF, CSIRO/ACDP, Australian Meat Industry Council, peak industry organisations	This activity aims to develop a national LSD surveillance strategy that will assist with detecting an LSD incursion as early as possible.	On track	Medium priority <ul style="list-style-type: none"> In August 2023, and in response to regional trade issues related to live animal exports DAFF published a comprehensive report demonstrating Australia's freedom from LSD, which collated data on disease investigations for suspected cases of LSD, feral animal surveillance undertaken by the Northern Australia Quarantine Strategy, inspections at export abattoirs and pre-export inspection of cattle and buffalo prepared for export. The AHC Epidemiology and Surveillance Advisory Group has finalised members from jurisdictions, DAFF and AHA. The National LSD Surveillance Strategy will consider work already conducted in individual jurisdictions. 	<ul style="list-style-type: none"> The Epidemiology and Surveillance Advisory Group will evaluate current national LSD surveillance activities as a priority, which will support development of the National LSD Surveillance Strategy.
4.1.b. Develop a wild and free-roaming bovid surveillance strategy	Lead State and territory governments Collaborators NAQS, NT Cattlemen's Association, other industry groups	This activity aims to develop a surveillance strategy to identify the locations, numbers and population dynamics of wild and free roaming bovid populations.	On track	Medium priority <ul style="list-style-type: none"> Wild animal surveillance for a potential LSD incursion is already part of the NAQS program. Further surveillance is undertaken by state and territory governments, including through the National Significant Disease Investigation Program. NAQS targeted surveillance strategy includes routine LSD serology on feral bovids (cattle, buffalo, banteng). Since routine testing commenced March 2022, there have been 123 feral bovids tested from 12 surveys in the NT and Western Australia (WA). All tests have returned negative serological results. Exclusion testing also occurs on any bovid skin lesions and internal lesions, which are clinically suggestive of LSD. Of the 123 feral bovids tested for serological exposure to LSD, 76 were tested for live LSDV using PCR. No PCR positives have been detected. 	<ul style="list-style-type: none"> As outlined in activity 4.1.a, the Epidemiology and Surveillance Advisory Group will consider current national LSD surveillance activities. NAQS will continue with LSD targeted surveillance in feral bovid populations, expanding surveillance into any feral cattle that may be inhabiting national parks in Qld.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
4.1.c. Review arthropod vector monitoring programs	Lead DAFF, state and territory governments Collaborators CSIRO, AHA	This activity will review Australia's current arthropod vector monitoring programs (including in near neighbouring countries) and investigate if there are opportunities or the need to adapt these programs to be relevant to LSDV surveillance.	On track	Medium priority <ul style="list-style-type: none"> • The capacity for midge species present in South-East Asia to act as mechanical vectors for LSD is being investigated through DAFF-funded research in Thailand. This project has been extended to March 2024. • The purpose of this research is to provide an indication of which species of midges could play a role in the possible transmission of LSD in Australia. • Vic is collaborating with ACDP in a research project to evaluate vectors of importance for spread and maintenance of LSD within Victoria. Work commenced on this project in June 2023. 	<ul style="list-style-type: none"> • Following results from the research project in Thailand, future activities could consider the scope and geographic coverage of existing vector surveillance programs implemented nationally, at seaports and airports, in jurisdictions for animal and human health and make recommendations for surveillance to better incorporate updated understanding of the geographic and seasonal distributions of vectors in Australia to inform risk assessments.

<p>4.2. Undertake training and awareness activities</p>	<p>Lead DAFF, state and territory governments</p>	<p>This activity seeks to develop training programs and raise awareness of the increased risk of LSD and other animal disease threats in the Australian livestock population.</p>	<p>On track</p>	<p>Medium priority</p> <ul style="list-style-type: none"> The Northern Australia Coordination Network (NACN) was established with \$4.33 million in funding to bring together NT, Qld, WA and Commonwealth governments in partnership with key industries and local communities to improve Australia’s surveillance and preparedness coordination in the north. All NACN partners are working together to deliver training, awareness and surveillance activities across northern Australia to help further develop capability to protect Australia from EADs including LSD. NACN jurisdictional coordinators have now been appointed with the NT, Qld and WA governments, and Industry Liaison Officers have commenced with the Kimberley Pilbara Cattlemen’s and NT Cattlemen’s Associations. The first Industry Biosecurity Readiness Response Training was held by NACN in Cloncurry, Qld, in October for a range of pastoralists and industry and government representatives. Regular presentations are given on NAQS surveillance, with a focus on current priority diseases. Audiences include producer groups, veterinarians, state and territory government stakeholders. Fee-for-service community animal health reporting activities occur through Indigenous ranger groups. These include reporting to highlight unusual sickness in cattle or buffalo residing within indigenous controlled lands. Topwatch! Public awareness material is distributed at agricultural shows, schools, producer forums and to rangers, with personnel available for any questions. This material includes calendars, brochures and factsheets highlighting the risk posed by various diseases including LSD. Regular engagement and discussion with Northern Australian Biosecurity Strategy Network (NABSnet) veterinarians is encouraging LSD exclusions and reporting. The network provides ongoing support for veterinarians in northern Australia via regular newsletters, contact through the NABSnet Veterinary Adviser, online resources and subsidies for significant disease investigations and EAD exclusions, and an annual masterclass. The NABSnet northern Australia Cattle Skin Survey has been extended until June 2024, to provide evidence on what is typically causing skin lesions in cattle in northern Australia. NSW Department of Primary Industries (NSW DPI) has a number of veterinary and para-veterinary training initiatives underway including training in emergency management. NSW DPI and Local Land Services have been undertaking a targeted surveillance and engagement program in NSW saleyards since October 2022. This work focuses on examining cattle for signs consistent with LSD or FMD and undertaking confirmatory sampling. So far over 292 inspections have been performed across 30 saleyards. The initial review of the data suggests 	<ul style="list-style-type: none"> NACN will now roll out Industry Biosecurity Readiness Response Training more widely across the north. NABSnet provides ongoing support via regular newsletters, contact through the NABS Veterinary Adviser, and online resources and subsidies for significant disease investigations and EAD exclusions. All jurisdictions will continue to deliver engagement and awareness activities, highlighting the risk of EAD’s like LSD. This ensures producers and other relevant stakeholders know who to contact when they encounter unusual signs of disease. The VRTT training course on FMD and other transboundary animal diseases (including LSD, sheep pox and goat pox) will be reviewed and delivered again in 2024, under an agreement with EuFMD. NSW DPI is producing a quarterly newsletter for veterinarians highlighting EAD threats, LSD will be the spotlight focus in the initial August publication. NSW DPI released issue 1 of EAD Vet Wrap in August 2023 – a quarterly newsletter to keep veterinary professionals up to date with EAD preparedness activities of the NSW DPI and provide updates on what is happening in NSW and beyond. The next issue of EAD Vet Wrap is planned to be released in November 2023. An NSW exercise based on LSD is planned for February 2024, to test “just in time” training modules that
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Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
				<p>that this surveillance over time could potentially provide important supporting evidence for absence of disease if an incursion were to occur elsewhere in Australia.</p> <ul style="list-style-type: none"> • Under its whole of government EAD preparedness program, Vic has been undertaking extensive work to raise awareness with livestock keepers to ensure they are aware of biosecurity risks and best practices and have in place enduring measures and practices to effectively manage biosecurity risks. Vic has held 82 biosecurity planning workshops targeted at mixed farming businesses and remote areas to assist with the development of 436 farm biosecurity plans, has held 82 awareness events for 5,767 producers, and 123 events for 1,520 other stakeholders, and has had 1,865 enrolments in eLearning modules to support the sector’s awareness of EAD events. • Qld officers have completed training to upskill in disease investigation procedures and techniques to increase capability and capacity for an EAD response. • Qld has conducted EAD investigation training for private veterinarians in collaboration with the University of Queensland (UQ) School of Veterinary Science and James Cook University (JCU). Plans are in place for this to be ongoing, twice yearly, in collaboration with both UQ and JCU. • Under an agreement between DAFF and EuFMD, a Virtual Real Time Training (VRTT) course was delivered to 40 jurisdictional government veterinarians. The VRTT course has recently been updated for Australia to include training on LSD, sheep pox and goat pox, and FMD. • SA officers are undertaking training and awareness activities to a wide range of stakeholders including private veterinarians, abattoirs, livestock agents, producers, stock feed manufacturers and transporters. • SA officers undertake surveillance at saleyards across the state with enhanced awareness for LSD. • SA officers have commenced distribution of glovebox skin sampling kits and training of producers in remote areas of SA. This will enable them to take samples that can be sent to a laboratory for testing. • WA has completed training for private practitioners including EAD awareness and sample submissions. WA has commenced an EAD Veterinary reserve training program. 	<p>have been developed for surveillance and tracing response staff.</p>

Objective 5: Preparedness and response

Table O5 Enhance the LSD preparedness and emergency response capacity and capability of industries and governments, and clearly define roles and responsibilities.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
5.1.a. Undertake risk mapping of the likelihood of entry, establishment and spread of LSD	Lead DAFF Collaborators State and territory governments, AHC, other partners	This activity aims to undertake risk mapping of geographical areas that may have a higher likelihood of entry, establishment and spread of LSD.	Completed	High priority <ul style="list-style-type: none"> DAFF commissioned a risk assessment examining the potential for an incursion through non-regulated pathways (such as windborne spread) by external consultants. This work will guide future modelling and vector studies and aid in targeting future surveillance activities. The risk assessment and modelling has been released on DAFF's website and published in the Journal of Preventative Veterinary Medicine. A summary of this risk assessment and modelling work was presented to industry representatives at a webinar on 4 May 2023. A recording of this presentation is available through the National Farmers Federation. 	nil
5.1.b. Develop epidemiological modelling systems for LSD	Lead DAFF Collaborators State and territory governments, AHC, other partners	This activity will focus on the development of systems for the epidemiological modelling of vector-transmitted disease outbreaks. The system will be used to integrate data from jurisdictional and national datasets.	On track	High priority <ul style="list-style-type: none"> A new LSD model is being developed using the Australian Animal Disease Spread (AADIS) platform. The model will assess areas in Australia where LSD may spread and establish and compare different control strategies, including the use and application of vaccination. The model will assist response plans and preparedness activities for LSD, including estimates on vaccine doses used under different outbreak scenarios. Jurisdictional government input has been sought on LSD control and vaccination strategies for modelling purposes. 	<ul style="list-style-type: none"> Model development has been completed and a series of case studies are being run to assess the spread of LSD in Australia and compare control measures under different incursion scenarios in northern Australia. The project is due to be completed in February 2024.

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Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
5.2.a. Develop a national LSD vaccination strategy	Lead AHC, AHA Collaborators CSIRO, Cattle Australia, the AHC Vaccine Expert Advisory Group (VEAG), other partners	This activity will establish a national LSD vaccine working group to develop a national LSD vaccination strategy, including options on how to best apply vaccination during a response and how to identify vaccinated animals.	On track	High priority <ul style="list-style-type: none"> A Vaccine Operational Task Group (VOTG) has been established under the Sub-Committee on Emergency Animal Disease (SCEAD) and is responsible for developing national recommendations for the use of vaccination during an outbreak. The VOTG will develop implementation plans about how LSD vaccination could be used, in the event of an LSD outbreak, using the most plausible scenarios which will be modelled through the AADIS-LSD model and other work (Activity 5.1.b). Membership of the national VOTG consists of all jurisdictions, the Commonwealth and AHA. Jurisdictions have also been developing their own policies and vaccination plans for LSD vaccination. 	<ul style="list-style-type: none"> The VOTG has been tasked with developing operational plans for using vaccination against other important livestock diseases but is prioritising LSD through to June 2024.
5.2.b. Access an LSD vaccine appropriate for use within Australia	Lead DAFF	Commercially available LSD vaccines will be evaluated to assess their suitability for emergency use in Australia.	On track	High priority <ul style="list-style-type: none"> International suppliers of homologous LSD vaccines were contacted in 2022 to determine if they could produce a vaccine in compliance with quality standards that could be certified by a competent authority recognised by Australia. A suitable vaccine was identified and the Australian Pesticides and Veterinary Medicines Authority (APVMA) has issued an Emergency Use Permit for the vaccine produced by MSD Animal Health. The ACVO applied for an import permit for the MSD Animal Health LSD vaccine in December 2022, to ensure the vaccine can be imported into Australia if it is ever needed. 	<ul style="list-style-type: none"> If the vaccine is ever needed in Australia import consent will need to be provided by the APVMA. This final consent will only be given when the arrival date of the vaccine is known.
5.2.c. Investigate options for the timely supply of LSD vaccines	Lead DAFF, AHA Collaborators State and territory governments, peak industry organisations	This activity aims to investigate options to secure access to LSD vaccines in the event of an outbreak, including the possibility of investment in an LSD vaccine bank modelled on the Australian FMD Vaccine Bank.	On track	High priority <ul style="list-style-type: none"> In June 2023, DAFF entered into a Regional LSD Vaccine Supply Arrangement with an international LSD vaccine manufacturer, MSD Animal Health, to supply 300,000 doses of LSD vaccines to Australia or other regional countries if required. In October 2023, DAFF officers met with representatives from AHA to discuss the Regional LSD Vaccine Supply Arrangement and the possibility of a co-funded LSD vaccine supply arrangement for use in Australia in the event of an outbreak. 	<ul style="list-style-type: none"> In November 2023, DAFF will discuss the Regional LSD Vaccine Supply Arrangement with AHC members and industry stakeholders.

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Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
5.3. Review the national LSD response strategy	<p>Lead AHA, AHC, DAFF, AUSVETPLAN Technical Review Group</p> <p>Collaborators Peak industry organisations</p>	This activity aims to ensure the national LSD response strategy is fit-for-purpose and well aligned with the national LSD vaccination strategy.	On track	<p>High priority</p> <ul style="list-style-type: none"> A joint government and industry exercise was developed by AHA to test components of the latest version of the AUSVETPLAN Response Strategy for LSD. Following the 2022 exercise (Exercise LSD2), the AUSVETPLAN Response strategy: <i>Lumpy skin disease</i> underwent updates with AHC endorsing the updated manual in October 2023. 	<ul style="list-style-type: none"> A number of items identified in the exercise were determined to be out of scope of AUSVETPLAN and were referred to other responsible parties for completion. The revision and update of the AUSVETPLAN Response Strategy for LSD partly completes this activity. Once the LSD vaccination strategy is developed, an alignment of benefits and outcomes will be undertaken.
5.4. Prepare to manage exported livestock in transit and in preparation for export during an incursion	<p>Lead DAFF</p> <p>Collaborators AHC, LiveCorp, MLA, live animal exporters</p>	This activity involves the development of a framework for contingency plans (including preparedness, logistics, biosecurity and welfare) for Australian livestock consignments which are within the export process, including those that are loading or those that have departed but not yet arrived in their destination country.	On track	<p>Medium priority</p> <ul style="list-style-type: none"> DAFF is continuing to develop a policy framework for broader export livestock incident management procedures. These incidents include the detection of a disease such as LSD and FMD in Australia as they relate to livestock exports. DAFF is working with interested stakeholders to develop operating principles for managing livestock conveyances, including the possible return of vessels carrying livestock to Australia and other contingency arrangements. 	<ul style="list-style-type: none"> DAFF will continue to engage with stakeholders to progress identified steps and update internal export livestock incident management procedures.
5.5. Investigate arthropod vector control options	<p>Lead DAFF</p> <p>Collaborators State and territory governments</p>	This activity will review Australia's current arthropod vector control options (including in near neighbouring countries) and investigate if there are opportunities to improve these or put in place plans to prevent the spread of disease.	On track	<p>Medium priority</p> <ul style="list-style-type: none"> A National Vector Management Advisory Group has recently been established under AHC. The group has a planned meeting with the Commonwealth to receive a brief on work already done, prior to finalising the groups work plan. 	<ul style="list-style-type: none"> The National Vector Management Advisory Group is currently tasked with developing an LSD vector management plan in the event of an outbreak.

Objective 6: Awareness and communication

Table O6 Facilitate stronger engagement between governments and industry through a comprehensive and adaptable communication strategy for LSD.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
6.1 Develop a comprehensive and sustained LSD communication plan to raise awareness and understanding of the disease, risk and preparedness activities	Lead The National Biosecurity Committee Engagement Network (NBCEN), peak industry organisations Collaborators DAFF	This activity will develop a comprehensive and sustained LSD communication plan to raise awareness and understanding of the disease, risk and preparedness activities.	Completed	High priority <ul style="list-style-type: none"> Since the beginning of the LSD outbreak in Indonesia, DAFF has worked in partnership with NBCEN members to increase communication and awareness activities surrounding LSD in an effort to decrease the risk of an incursion and promote producer and community awareness. DAFF has finalised the LSD prevention and preparedness communication plan to support LSD awareness and stakeholder engagement. 	<ul style="list-style-type: none"> Biosecurity awareness activities are ongoing and remain a priority. To date, these have included social media and website updates, webinars, podcasts, education program content and border signage. These activities will continue as business usual.
6.2. Develop a communication plan for use during an LSD emergency response	Lead NBCEN	This activity will develop a communication plan that could be used during an incursion of LSD.	On track	Medium priority <ul style="list-style-type: none"> DAFF worked with NBCEN to draft a national communication plan for use in an LSD incursion/emergency response. DAFF, in partnership with NBCEN members, has been developing a detailed communication response guide for activation in the case of a significant EAD incursion. The communication guide includes response triggers for communication activities, governance arrangements and a series of prepared messages across various mediums (website, media release, social media etc.), to be refined depending on the details of the incident, and that can be rapidly activated if needed. Industry webinars on LSD and FMD were also held in March 2023 with members from across the animal industry. The webinars provided an overview and reassurance of communication activities DAFF would implement in the first 72 hours of an EAD outbreak. DAFF is planning further webinars with plant and retail sectors in the coming months. 	<ul style="list-style-type: none"> Next steps are expected for the plan to progress to AHC and NBC for noting.

Objective 7: Research and innovation

Table O7 Improve Australia's LSD preparedness and response through research priorities driven by industry and government needs, and ensure new knowledge is freely accessible.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
7.1. Set national priorities for LSD research, engagement and communication	Lead DAFF, the National Animal Biosecurity Research, Development and Extension (RD&E) Strategy (AHA), AHC	This activity will seek to bring together industry, government and other stakeholders to identify, prioritise and undertake important LSD-related research and preparedness activities.	On track	Low Priority <ul style="list-style-type: none"> A workshop is being planned by DAFF, with support from AHA, to identify knowledge gaps and prioritise RD&E opportunities. 	<ul style="list-style-type: none"> This workshop was postponed due to competing priorities. It will be revisited in 2024.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
7.2. Investigate new technology LSD vaccines	<p>Lead ACDP, Elizabeth Macarthur Agricultural Institute (EMAI)</p> <p>Collaborators DAFF, state and territory governments, industry, MLA</p>	This activity will seek research interest in developing alternative vaccine technologies that can be deployed both in Australia and internationally to control the further spread of LSD.	On track	<p>Medium Priority</p> <ul style="list-style-type: none"> DAFF conducted an open market discovery process, seeking responses from potential vaccine manufacturers about the possible development of novel LSD and other livestock vaccines and the potential for Australian-based vaccine production capability. NSW and Qld governments and the Commonwealth through MLA, are investing in a \$4.95 million project to support research into messenger ribonucleic acid (mRNA) vaccines for livestock, including LSD. This project aims to deliver an mRNA LSD vaccine construct that has undergone in-vivo efficacy testing by 2024. Proof of concept has been achieved with Border disease virus in sheep with progress on mRNA dose and formulation optimisation. NSW government is investing a further \$8.8M in this program and mRNA vaccine production capacity is being built into the NSW RNA pilot facility. mRNA vaccines have been shown to give high serological response and protection against challenge with the ruminant pestivirus Border disease virus in sheep. Collaborators at the Canadian Food Inspection Agency (CFIA, Winnipeg) and Tiba Biotech have made 6 mRNA constructs effective at generating serological responses in mice against 6 different targets on the LSDV. NSW DPI is testing vaccine constructs in rabbits at EMAI. The serological work aims to optimise formulations and construct combinations before challenge studies with LSDV are done. Qld's government has invested in a collaborative project with UQ to develop a prototype single-dose microencapsulated subunit vaccine for LSD. 	<ul style="list-style-type: none"> NSW are investigating options for undertaking vaccine efficacy studies. It is not certain whether these will be conducted in Australia or overseas.
7.3. Develop modelling tools to support LSD preparedness and response	<p>Lead DAFF, Centre of Excellence for Biosecurity Risk Analysis (CEBRA)</p> <p>Collaborators State and territory governments</p>	This activity will seek investment in other modelling tools to hone Australia's LSD preparedness and response (in addition to epidemiological modelling tools developed under Activity 5.1.b).	On track	<p>Medium Priority</p> <ul style="list-style-type: none"> To strengthen national real-time modelling capabilities during an outbreak response, a stakeholder workshop was held in August 2022 to identify gaps and priorities for real-time modelling activities during an outbreak response, using LSD as the test case. Outputs from the workshop will guide the development of modelling tools and workflows to support decision making during an emergency response. A workplan to develop modelling tools and workflows has been finalised. Work has begun on building a suite of decision support tools, including epidemiological analyses and forecasting models for outbreak response. 	<ul style="list-style-type: none"> The project is expected to run until 30 June 2024.

Objective 8: Recovery

Table O8 Mitigate the economic and social effects of an outbreak of LSD by developing options for a recovery strategy.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
8.1. Develop options for an LSD recovery strategy	Lead DAFF, in consultation with other Australian Government agencies as appropriate	This activity will develop options for a LSD recovery strategy in consultation with other Australian Public Service agencies as appropriate, to assist in overall preparedness in the event of an LSD outbreak.	Completed	High priority <ul style="list-style-type: none"> DAFF has developed initial options for consideration by government regarding community recovery in an EAD incursion, such as LSD. This aligns with Recommendation 9 of the Exotic Animal Disease Preparedness Joint Interagency Taskforce. Whole-of-Government policy options were developed in consultation with an Interdepartmental Committee co-chaired by DAFF and the Department of Prime Minister and Cabinet. Policy options were provided to the Australian Government for consideration. Work to develop a just-in-case policy response for support and recovery in the event of an EAD outbreak was completed in late 2022. DAFF will review the work periodically to ensure currency of advice and continue to engage with disaster funding reviews that are ongoing across the Australian Government. Under Vic's whole of government EAD preparedness program, consequence mapping of an incursion was undertaken and will be updated to consider the whole of government implications of an EAD event. This specifically relates to the potential for agriculture industry support and compensation, support of ancillary sectors that would be impacted by an EAD event, and support for the health and wellbeing of impacted communities. 	<ul style="list-style-type: none"> Further development of recovery policy for biosecurity events is ongoing and remains a priority for DAFF. Periodic review of the LSD recovery strategies will be undertaken to ensure consistency and currency.