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National Lumpy Skin Disease Action Plan Progress Report 6 February to April 2024

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.

Contents

Tables

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, 4 have been completed, and 23 are underway and on track. 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	**Lead** Department of Agriculture, Fisheries and Forestry (DAFF), Department of Foreign Affairs and Trade (DFAT) **Collaborators** Meat & Livestock Australia (MLA), the Australian Centre for Disease Preparedness (ACDP), overseas partners	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	**High priority** **Support for distribution of vaccines and equipment** • DFAT has provided 435,000 LSD vaccines to the Indonesian government. • In 2023 DAFF provided an additional 1 million doses of LSD vaccine to Indonesia, as well as syringes and needles. • 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. **Laboratory capacity** • 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 and FMD. • REDS has been extended through to 30 June 2026 and expanded to include supporting laboratory capacity and QA for Indonesian Quarantine Agency (IQA) laboratories in addition to the Indonesian Ministry of Agriculture (MoA) laboratories. • During January 2024, Disease Investigation Centre (DIC) Wates (Indonesian reference laboratory for LSD) distributed LSD network quality controls (NQCs) for both PCR and enzyme-linked immunosorbent assay (ELISA) tests to the laboratories of the Indonesian veterinary diagnostic network. • NQCs function as common positive controls across the network and provide progressive monitoring of assay sensitivity and feedback to all laboratories on their assay performance. Use of common controls support continuous improvements in QA and can assist with early warning of changes in assay sensitivity that may require investigation. • The network laboratories have included the NQCs in routine testing conducted during January to April 2024 and returned results of the NQC to DIC Wates for collation and	**Support for distribution of vaccines and equipment** • The Australian Government (DAFF/DFAT) is working with MoA on further support as requested. This includes the provision of additional doses of vaccines and technical support through DFAT's Australia Indonesia Health Security Partnership (AIHSP). **Laboratory capacity** • The REDS program's focus is to assist with implementation of proficiency testing (PT) programs for FMD and LSD by the Indonesian reference laboratories for the Indonesian veterinary laboratory network. • A site visit in April and May 2024 to DIC Wates will complement virtual training and provide practical support and guidance for implementation of the LSD PT program for ELISA and PCR. • DAFF is working with IQA to finalise a laboratory cooperation and capacity

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
				analysis. The first report detailing results of the NQC testing is currently being prepared for publication to the network. • During February and March 2024 refresher training in PT planning and implementation has been delivered by the ACDP. **Technical assistance** • 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. • AIHSP partners directly with the Indonesian 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. **Other technical and advisory support** • $1.4 million has been provided 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. From July 2023 to March 2024, a DAFF officer was seconded to FAO to support this project (Activity 1.3). The program will conclude on 31 December 2024. • Indonesian quarantine officers have been trained through the DAFF-funded Biosecurity Training Centre (BTC) at Charles Sturt University (Activity 1.2).	building program for IQA laboratories and staff. **Technical assistance** • 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.
1.2. Build LSD preparedness, technical and diagnostic capability and surveillance in near neighbouring countries	**Lead** DAFF **Collaborators** Overseas partners, DFAT, Agriculture Victoria (AgVic)	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 Agriculture and Fisheries	On track	**High priority** • DAFF has funded LSD testing capacity in Timor-Leste, with both PCR nucleic acid testing and 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 in 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) Program. • 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 has supported establishing a cool room in Dili which is currently housing priority animal disease vaccines. Interim cold-chain arrangements have also been established across 3 border municipalities in Timor-Leste.	• The development of a vaccination plan for LSD for PNG, including cold chain arrangements for EAD vaccines, is being supported by DAFF.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
		(MAF) to improve their LSD preparedness, technical and diagnostic capability, and surveillance.		• 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 assessments were 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 (NT) 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 has been developed to mitigate the risk of LSD and other priority diseases, and the first phase will be delivered in Port Moresby in June 2024. The same training program will be delivered in Timor-Leste in July 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 Southeast 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** • 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, including the Director General of Livestock and Animal Health in the Indonesian MoA. • A DAFF officer was seconded to FAO and based in Indonesia from July 2023 to January 2024. This officer provided a ready conduit between Indonesian and Australian experts and helped to establish and strengthen relationships that have extended beyond the posting. • The Office of the Chief Veterinary Officer has established a presence in northern Australia, led by the ACVO.	• DAFF is continually seeking to build relationships in Southeast Asia, including promoting engagement around LSD and other important animal health issues.
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** • 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. • A DAFF officer participated in the 4th LSD Coordination Meeting for Southeast Asia held 28-29 November 2023.	• 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	**Lead** DAFF **Collaborators** Peak industry organisations	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	**High priority** • In response to the spread of LSD in Southeast 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 December 2023, DAFF published the final report of Australia's current entry requirements for LSD in fresh beef (skeletal muscle) and beef products. The final report advises that certification of country freedom from LSD to cover importation of fresh beef derived exclusively from bovine skeletal muscle from approved countries is unnecessary on biosecurity grounds. Negotiation of revised health certificates continues. • The second draft of the review of the import policy for dairy products for human consumption was released on 18 April 2024. The second draft proposes to remove specific risk management measures for LSD virus (LSDV) from the review, as new evidence demonstrates that pasteurisation is effective at inactivating LSDV.	• 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.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
2.2. Develop a strategic approach to minimising export trade disruptions	**Lead** DAFF **Collaborators** DFAT, the Australian Livestock Exporters' Council, LiveCorp, MLA, other industry groups, state and territory governments	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	**High priority** • 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 $700 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 was held in December 2023 to facilitate these discussions and a second workshop is planned for 2024. • Trade in live cattle exports was maintained to key regional export markets following temporary disruptions related to questions regarding Australia's LSD status in 2023.	• 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. • DAFF is organising a dedicated second workshop for industry stakeholders, Animal Health Australia (AHA) and participating jurisdictions in June 2024 covering zoning for trade in the event of EAD outbreaks. Following this Victoria (Vic), supported by DAFF, will organise a workshop for jurisdictions to discuss and prioritise future collaborative activities that support zoning for trade.

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	**Lead** ACDP, Laboratories for Emergency Animal Disease Diagnosis and Response (LEADDR) **Collaborators** DAFF	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).	On track	**High priority** • In early March 2023, a report on potential materials for NQC of LSD testing (PCR) and a schedule for the roll-out of serological capabilities to LEADDR laboratories was supplied to DAFF. • NQC material for LSD PCR testing was developed and transferred to LEADDR in May 2023 to support QA amongst LEADDR laboratories. The first 2 rounds of Capripox PCR PT (testing for LSDV) have been completed. • LSD positive serum for NQC of serological testing (ELISA) has been sourced. • An import permit now exists for the Innovative Diagnostics (ID) Capripox ELISA kit. ID Screen Capripox ELISA kits have been sent to all LEADDR laboratories participating in the serological testing, and the first round of ELISA PT has been completed. • A series of laboratory workshops and practical exercises, named Exercise Waterhole, were 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 assessed the effectiveness of the information management systems currently in use in Australia and provided opportunities to identify areas for improvement in laboratory capacity and capability. • Under a whole of government EAD preparedness program, Vic is strengthening its laboratory capacity for both rapid and sustained responses to disease outbreaks. • A comprehensive literature review on the feasibility of environmental DNA/RNA (eDNA/RNA) testing of a number of viruses, including LSD, was completed by the National eDNA Reference Centre in September 2023, and highlights the potential of using eDNA/RNA technologies as a complimentary surveillance method.	• LEADDR laboratories are submitting NQC results for both Capripox PCR and ELISA testing with the aim of harmonising results within the network.

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	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.	On track	**Medium priority** • Negative samples have been collected to support development of serological tests (ELISA) in Australian animals. • 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 LSDV detection and characterisation. • After securing the appropriate regulatory approvals, ACDP participated in an international Capripox (inactivated) PT round for serology and molecular diagnostic workflows in July 2023, and will also be participating in the 2024 international PT program. • 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. • A series of cell lines was also established for the production of monoclonal antibodies against the LSDV P32 antigen. One clone has been identified as being better suited for IHC. A large batch of this antibody has been prepared and affinity purified for diagnostic use. • 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 is progressing. • Verification of virus isolation methods for LSDV using cell culture is continuing. A virus neutralisation test for LSDV has been implemented and is undergoing verification.	• Further collection of negative samples through DAFF's Northern Australian Quarantine Strategy (NAQS) will occur to support development of serological tests (ELISA). • Further rounds of IHC, using the large batch of affinity purified monoclonal antibody, will now be undertaken to optimise the detection of viral antigen in fixed tissues. • ACDP has utilised its international networks to obtain a recombinant, field relevant strain of LSDV to support ongoing preparedness activities.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
3.3. Explore point-of-care LSD testing	**Lead** ACDP, the Sub-Committee on Animal Health Laboratory Standards (SCAHLS) and the Animal Health Committee (AHC) **Collaborators** DAFF and state and territory governments	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	**Medium priority** • 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 was reformed in August 2023 with nominated representatives from the Commonwealth, all Australian jurisdictions, ACDP, AHA, Wildlife Health Australia (WHA), and James Cook University (JCU). The task group continues to meet monthly and is expecting to finalise their work by June 2024. • New South Wales (NSW) have developed capacity to undertake POC testing for LSDV in the event of an outbreak using portable PCR machines. • Vic 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. • On behalf of jurisdictional government and industry stakeholders, ACDP continues to undertake assessment of LSD POC diagnostics suitable for field deployment. • Queensland's (Qld) Department of Agriculture and Fisheries is investigating in-field POC test for LSDV, working in collaboration with the Commonwealth Scientific and Industrial Research Organisation (CSIRO). • SA has acquired LAMP POC testing machines and work is continuing to explore potential use in the field during EAD responses.	• The AHC POC testing working group will draft a nationally consistent definition of POC tests, along with clear principles for POC test use in disease response and routine surveillance. • Vic's selected LAMP POC primer set will be further developed to increase its speed and is due to be taken to an international laboratory in Thailand or India in mid-2024 for validation using their stored clinical samples.

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, 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** • 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 cattle with skin lesions, feral animal surveillance undertaken by NAQS, 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 advisory group met on 29 April 2024 to progress development of the LSD surveillance strategy. • The National LSD Surveillance Strategy will consider work already conducted in individual jurisdictions.	• 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** • 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. • WHA is exploring the feasibility of developing a network to engage with feral animal managers on matters of wildlife health. Such a group may ultimately have value for this program, but work is still preliminary.	• 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** • The final report from the DAFF-funded research project in Thailand, assessing the capacity for midge species to act as mechanical vectors for LSDV, is currently under review. • Vic is collaborating with ACDP in a research project to evaluate vectors of importance for spread and maintenance of LSD within Vic. Work commenced on this project in June 2023 and is continuing as planned.	• The collaborative research project being conducted by ACDP and Vic to evaluate LSD vectors of importance is continuing throughout 2024 and into 2025 with findings to be provided in due course.

4.2. Undertake training and awareness activities	**Lead** DAFF, state and territory governments	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.	On track	**Medium priority** • 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 continues to roll out communications and industry training across northern Australia. • 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 subsides for significant disease investigations and EAD exclusions, and an annual masterclass. The most recent annual NABSnet masterclass was held in Darwin from 15-16 March 2024. • 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. • Under an agreement between DAFF and the European Commission for the Control of Foot-and-Mouth Disease (EuFMD), a Virtual Real Time Training (VRTT) course was delivered to 40 jurisdictional government veterinarians in August 2023. The VRTT course was updated for Australia to include training on LSD, sheep pox and goat pox, in addition to FMD. • NSW Department of Primary Industries (NSW DPI) conducted an exercise based on LSD in February 2024, to test "just in time" training modules that were developed for surveillance and tracing response staff. • A NSW multi-agency exercise to test existing disposal planning was held in February 2024 with the Engineering functional area leading the exercise and DPI staff participating.	• Planning is underway for a NACN WA, NT and Qld cross-border LSD response exercise for late 2024. The exercise will test cross-border arrangements for a hypothetical incursion of LSD into northern Australia. • 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 (LSD, sheep pox and goat pox), developed with EuFMD, will be delivered to another cohort of jurisdictional veterinarians and technical animal health staff beginning on 20 May 2024, under an agreement with EuFMD.

				• 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 473 inspections have been performed across 30 saleyards. The initial review of the data suggests that this surveillance over time could potentially provide important supporting evidence for absence of disease if an incursion were to occur elsewhere in Australia. • NSW DPI released issue 3 of EAD Vet Wrap in February 2024 – 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 February edition had an update on LSD in Indonesia and South Korea. The next issue of EAD Vet Wrap is planned to be released in May 2024. • 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. A pilot disease investigation workshop was delivered to cattle industry staff, promoting EAD awareness and reporting. • Qld has conducted EAD investigation training for private veterinarians in collaboration with the University of Queensland (UQ) School of Veterinary Science and JCU. These workshops continue to be conducted annually. • Biosecurity Qld has conducted 10 face-to-face and virtual response readiness training courses for staff, elected officials, and emerging leaders of agricultural peak industry bodies. • 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 continue to visit saleyards across the state with enhanced awareness for LSD. • SA officers have finished 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. • SA continues to engage in staff training utilising NSW "Just in time" training and EuFMD modules which now also cover LSD.	

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
				• WA has completed training for private practitioners including EAD awareness and sample submissions. WA has commenced an EAD Veterinary reserve training program. • DAFF officers are currently pursuing a project proposal, supported by AHC, to sponsor private veterinarians (PVs) to attend the EAD Symposium at the Australian Centre for Disease Preparedness in 2024. This project will increase EAD awareness among PVs, improve their capability to undertake significant disease investigations, and help to establish a 'community of practice' network.	

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** • 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** • A new LSD epidemiological model has been developed using the Australian Animal Disease Spread (AADIS) platform to assess areas in Australia where LSD may spread and compare different control strategies, including the use and application of vaccination. • A report on the AADIS modelling work is being finalised and a communication plan developed for its release.	• Following release of the AADIS modelling, the department will work with stakeholders to decide on how the model may be expanded to cover a greater range of control options. • UQ is developing a predictive model for enhancing preparedness and response strategies. This model will aim to optimise Australia's surveillance and response plans by anticipating potential outbreaks through analysing data unique to Australia.

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** • 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). • The VOTG continues to meet regularly and has progressed the operational plans required to roll out the approved LSD vaccine for the use in an outbreak. • 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.	• 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. Once AADIS models have been finalised on different LSD outbreak scenarios, operational plans can be formulated based on the potential vaccine requirements.
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** • 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. • A DAFF import permit is close to being finalised for the MSD Animal Health LSD vaccine, to ensure the vaccine can be imported into Australia if it is ever needed.	• If the vaccine is ever needed in Australia, a consent to import will need to be provided by the APVMA. An application for the consent to import will be made after the import permit has been finalised.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
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** • 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. • In November 2023, DAFF presented on the Regional LSD Vaccine Supply Arrangement at the AHC Stakeholder Forum. In March 2024, DAFF presented on the same topic to government and industry stakeholders. • In March 2024, DAFF presented on the Regional LSD Vaccine Supply Arrangement to government and industry stakeholders.	• DAFF will continue to investigate options for the timely supply of LSD vaccines with relevant collaborators.
5.3. Review the national LSD response strategy	**Lead** AHA, AHC, DAFF, AUSVETPLAN Technical Review Group **Collaborators** Peak industry organisations	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	**High priority** • In 2022, 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: Lumpy skin disease* underwent updates with AHC endorsing the updated manual in October 2023. 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.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
5.4. Prepare to manage exported livestock in transit and in preparation for export during an incursion	**Lead** DAFF **Collaborators** AHC, LiveCorp, MLA, live animal exporters	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	**Medium priority** • 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. • On 18 December 2023 changes were made to the *Export Control (Animals) Rules 2021* to allow DAFF to require the moving or loading of livestock for export to stop in circumstances where the Secretary reasonably suspects that an exotic animal disease, infection or infestation is present in Australia. The changes are designed to prevent or significantly reduce the potential health and welfare impacts to livestock about to be, or in the process of being, loaded for export, and mitigate potential damage to Australia's reputation as a trusted trading nation more broadly.	• DAFF will continue to engage with stakeholders to progress identified steps and update internal export livestock incident management procedures. • DAFF received $8.8 million over 2 years to support the continuation of the livestock export trade, including funding to develop a national approach to manage livestock in transit and when they may need to return to Australia. Updates on the progress of the Managing Livestock in Transit project are reported against that measure.
5.5. Investigate arthropod vector control options	**Lead** DAFF **Collaborators** State and territory governments	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	**Medium priority** • A National Vector Management Advisory Group (NVMAG) has been established under AHC, tasked with developing an LSD vector management plan in the event of an outbreak. The group has completed a list of available chemical control products for LSD vectors. • DAFF is overseeing the delivery of an LSD vector management options guide in collaboration with NVMAG and has engaged a consultant to develop the guide for the prevention and control of LSD in Australia. The guide will be written to inform government operational policymaking and consider enterprise type, geographic location, protection of high-value animals, stock movements and vector management on high-risk premises.	• The LSD vector management options guide is currently being developed and is expected to be finalised by 30 June 2024.

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
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 in November 2023
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.	Completed in February 2024

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** • A workshop is being planned by DAFF, with support from AHA, to identify knowledge gaps and prioritise RD&E opportunities.	• 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	**Lead** ACDP, Elizabeth Macarthur Agricultural Institute (EMAI) **Collaborators** DAFF, state and territory governments, industry, MLA	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	**Medium Priority** • 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 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 has tested vaccine constructs in rabbits at EMAI and will look for serological responses in cattle. • Qld's government has invested in a collaborative project with UQ to develop a prototype single-dose microencapsulated subunit vaccine for LSD.	• NSW are investigating options for undertaking vaccine efficacy studies. It is not certain whether these will be conducted in Australia or overseas. CFIA will test mRNA vaccine candidates for efficacy against LSD in sheep.

Activity	Lead and key collaborators	Description	Status	Priority progress update	Next steps
7.3. Develop modelling tools to support LSD preparedness and response	**Lead** DAFF, Centre of Excellence for Biosecurity Risk Analysis (CEBRA) **Collaborators** State and territory governments	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	**Medium Priority** • 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 was finalised. Work continues on building a suite of decision support tools, including epidemiological analyses and forecasting models for outbreak response.	• The current project is expected to run until 30 June 2024. • A subsequent project "Enhancing Models for Rapid Decision-Support in EAD Outbreaks" will run from 2024 to 2026 to support the uptake and operationalisation of epidemiological models to support decision-making during outbreak response. This project is funded by the Australian Research Data Commons.

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
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 in November 2023

Glossary

Acronym	Definition
AADIS	Australian Animal Disease Spread
ACDP	Australian Centre for Disease Preparedness
ACVO	Australian Chief Veterinary Officer
AgVic	Agriculture Victoria
AHA	Animal Health Australia
AHC	Animal Health Committee
AIHSP	Australia Indonesia Health Security Partnership
APVMA	Australian Pesticides and Veterinary Medicines Authority
AUSVETPLAN	Australian Veterinary Emergency Plan
BTC	Biosecurity Training Centre
CFIA	Canadian Food Inspection Agency
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAFF	Department of Agriculture, Fisheries and Forestry
DFAT	Department of Foreign Affairs and Trade
DIC	Indonesian Disease Investigation Centre
EAD	Emergency animal disease
ELISA	Enzyme-linked immunosorbent assay
EMAI	Elizabeth Macarthur Agricultural Institute
eDNA/RNA	Environmental deoxyribonucleic acid/ribonucleic acid
EuFMD	European Commission for the Control of Foot-and-Mouth Disease
FAO	Food and Agriculture Organisation of the United Nations
FMD	Foot-and-mouth disease
GF-TADs	Global Framework for the progressive control of Transboundary Animal Diseases
ID	Innovative Diagnostics
IHC	Immunohistochemical
IQA	Indonesian Quarantine Agency
JCU	James Cook University
LAMP	Loop mediated isothermal amplification
LEADDR	Laboratories for Emergency Animal Disease Diagnosis and Response
LiveCorp	Australian Livestock Export Corporation
LSD	Lumpy skin disease
LSDV	Lumpy skin disease virus
MAF	Timor-Leste's Ministry of Agriculture and Fisheries
MLA	Meat & Livestock Australia
MoA	Indonesian Ministry of Agriculture
mRNA	Messenger ribonucleic acid
NABSnet	Northern Australian Biosecurity Strategy Network
NACN	Northen Australia Coordination Network
NAQIA	Papua New Guinea's National Agriculture Quarantine and inspection Authority

NAQS	Northern Australian Quarantine Strategy
NBCEN	National Biosecurity Committee Engagement Network
NQCs	Network quality controls
NSW	New South Wales
NSW DPI	New South Wales Department of Primary Industries
NT	Northern Territory
NVMAG	National Vector Management Advisory Group
PCR	Polymerase chain reaction
PNG	Papua New Guinea
POC	Point-of-care
PT	Proficiency testing
QA	Quality assurance
Qld	Queensland
RD&E	Research, Development and Extension
REDS	Regional Emerging Disease Support
SA	South Australia
SCAHLS	Sub-Committee on Animal Health Laboratory Standards
SCEAD	Sub-Committee on Emergency Animal Disease
SSBA	Security-Sensitive Biological Agent
UQ	University of Queensland
Vic	Victoria
VOTG	Vaccine Operational Task Group
VRTT	Virtual Real Time Training
WA	Western Australia
WHA	Wildlife Health Australia