

## Centre for Invasive Species Solutions – Innovation Portfolio One Snapshot

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**INCURSIONS DOMAIN:** Australia faces a new wave of vertebrate pest threats, arising from illegal importation and keeping, escape from legal keeping, and as hitchhikers in the international movement of goods and people. The Centre’s incursions domain currently consists of five projects which are developing new and innovative detection and surveillance techniques, along with management strategies to ensure we protect Australia’s environment and our \$60 billion+ agricultural industry from new pest threats.

Title / URL link	Project snapshot	Project partners (lead partner bolded)	Total project funding	Funding contributions
<a href="#">Development of a National Incursion Management Framework for Invasive Species - Stage 1</a>	This project is aiming to understand the roles and responsibilities with respect to prevention and detection in the animal and plant incursion space. It aims to improve recognition of what is required to increase efficiency and effectiveness of responses to new animal and plant incursions of national significance and will promote pathways to adoption for new incursion technologies.	<b>DPIRD (WA)</b> PIRSA (SA) DEDJTR (Vic) DPIPWE (Tas) DPI (NSW) DAWR (AUS)	\$253,105	\$170,105 Cash  \$83,000 In-kind
<a href="#">Understanding and intervening in illegal trade in non-native species</a>	This project aims to develop a comprehensive understanding of the nature of exotic pet keeping and illegal vertebrate species trade in Australia, which will lead to preventing the incursion of new alien species.	<b>University of Adelaide</b> CSIRO (AUS) Arthur Rylah Institute (Vic) PIRSA (SA) Australian Museum (NSW)	\$2,238,901	\$766,129 Cash  \$1,472,772 In-kind
<a href="#">Development of integrated passive and active surveillance tools and networks</a>	The broad objective of this project is to develop a coherent, complementary surveillance approach for combining community surveillance and targeted surveillance using passive (e.g. community sighting) and active sensing (e.g. eDNA) technologies to detect and manage pest incursions in a timely manner.	<b>CSIRO</b> DPIRD (WA) University of Adelaide Biosecurity Qld University of Canberra Arthur Rylah Institute (Vic)	\$1,342,578	\$373,912 Cash  \$968,666 In-kind
<a href="#">Real time eDNA tools to improve early detection and response approaches for high risk pest animals</a>	This project aims to develop an enhanced detection of exotic species, both those that are identified as high-risk taxa and for those that could potentially pose a biosecurity risk using real time environmental DNA sampling techniques.	<b>University of Canberra</b> DPI (NSW)	\$1,840,543	\$833,048 Cash  \$1,007,495 In-kind
<a href="#">Tools for developing cost-effective decisions for managing invasive pest eradications</a>	This project aims to develop new tools/systems for guiding decisions around an eradication response for invasive pests that will improve capability of government agencies to make cost-effective decisions around the feasibility and use of resources. Use of these tools should therefore result in more successful and cost-effective eradications of invasive pests that maximises the economic benefits to industry and the environment.	<b>Arthur Rylah Institute (Vic)</b> CSIRO University of Adelaide DEDJTR (Vic) Landcare Research (NZ)	\$1,107,868	\$739,118 Cash  \$368,750 In-kind

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**INTGRATED LANDSCAPE MANAGEMENT DOMAIN:** Established vertebrate pests continue to cause considerable impact to Australia’s agricultural industries, the environment and the well-being of its communities. Our Integrated Landscape Management program has six projects aimed at developing our knowledge of pest animal management to develop strategies which are solutions-orientated and provide direct benefits to farmers on-ground and protect our environment.

Title	Proposed project outcomes	Project partners	Total project funding	Funding contributions
<a href="#">Cost-effective management of wild deer</a>	Wild deer are present in all Australian states and territories and are causing increasing agricultural, environmental and social impacts. There are six species of deer but we know little about best practice management. In collaboration with associated organisations around the country this project is looking into cost-effective methods for reducing the impacts of wild deer in Australia and then disseminate this knowledge widely to the deer management community.	<b>DPI (NSW)</b> DAF (Qld) University of Canberra Tasmanian Land Conservancy Chartered Towers Regional Council	\$2,634,300	\$1,068,000 Cash  \$1,566,300 In-kind
<a href="#">The role of wild deer in the transmission of diseases of livestock</a>	This project will directly investigate the risk posed by deer to the livestock industry as hosts for exotic disease. This project will also evaluate the effectiveness of possible mitigation strategies should an outbreak occur. This will be achieved by estimating deer population density adjacent to farms, quantifying their level of interactions with livestock, the level of connectivity between local deer populations and by estimating the cross-species infection rate between deer and livestock species.	<b>Arthur Rylah Institute (Vic)</b> DPI (NSW) DEDJTR (Vic) La Trobe University	\$1,617,954	\$1,083,758 Cash  \$534,196 In-kind
<a href="#">Management of wild dog and deer in peri-urban landscapes: strategies for safe communities</a>	Peri-urban local governments have identified the need for better tools and strategies for control of wild dogs (and foxes) and deer. This project aims to provide, through collaborations and community-led actions, pest management with alternative strategies for managing wild dogs and deer in peri-urbans areas of Australia.	<b>DAF (Qld)</b> DPI (NSW) ACT Parks (ACT) LLS (NSW) Griffith University Sunshine Coast, Brisbane and Gympie Councils	\$3,898,125	\$800,000 Cash  \$3,098,125 In-kind
<a href="#">Preparing for Reset Landscape-scale Predator Management [Prep4Reset]</a>	Prep4Reset will synthesise research and collect before-control predator, wildlife and livestock impact data to enable the planning, implementation and evaluation of the Full Reset project. Prep4Reset also funds crucial networking to generate financial and time co-investment from multiple stakeholders in the Full Reset project. This facilitates the economic and environmental benefits that only integrated landscape-scale management can provide.	<b>DPI (NSW)</b> LLS (NSW) MLA AWI	\$1,625,000	\$1,225,000 Cash  \$400,000 In-kind
<a href="#">Assessment of the biodiversity, economic and productivity gains from exclusion fencing (Queensland)</a>	This project aims to determine the cost-effectives of cluster fencing in the short and long term through the reduction in predation by wild dogs and reduced competition from kangaroos. This requires an assessment of the effectiveness of pest control as done by landholders, improvements in pasture production and, ultimately, improvements to livestock production, all relative to unfences areas. It will also assess biodiversity benefits through vegetation cover and increases in wildlife abundance and biodiversity.	<b>DAF (Qld)</b> MLA DES (Qld) DPI (NSW) DPIRD (WA)	\$1,638,250	\$277,000 Cash  \$1,361,250 In-kind
<a href="#">Assessment of the biodiversity, economic and productivity gains from exclusion fencing (WA)</a>	This project first aims to understand the relationships between active predator management, cell-fencing and water availability on native herbivores, introduced herbivores and introduced predators. Second, it aims to assist landholders by assessing viability of increasing small stock production through manipulating predation and herbivores using active predator control, fencing and water availability. To address these aims the project will determine changes in density of introduced predators (primarily wild dogs and cats), native and introduced herbivores in response to fencing, predator densities and water availability. It will also identify how changes in predator and herbivore density in can be practically utilised by landholders to improve small stock production and native biodiversity.	<b>DPIRD (WA)</b> MLA DBCA (WA) Murdoch University	\$744,750	\$272,000 Cash  \$472,750 In-kind

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**BIOCONTROL DOMAIN:** Classical biological control of vertebrate pests using self-disseminating viral agents has served Australia well as the basis of cost-effective continental scale management, particularly for rabbit management. The Centre has two new major projects which will continue to implement our 20 year rabbit biocontrol pipeline. However, we are also looking at new areas such as a potential biocontrol option for tilapia management and the possibility of using genetic technologies for pest animal management.

Title	Proposed project outcomes	Project partners	Total project funding	Funding contributions
<a href="#">Understanding RHDV2 interaction with other RHDVs and its potential as an additional rabbit biocontrol agent</a>	This project aims to explore the potential of RHDV2 to complement existing biocontrol agents through a series of experimental studies. This project plays a vital role in the Centre for Invasive Species Solutions 20 years rabbit biocontrol pipeline and aims to understand the potential use of this virus as a future rabbit biocontrol agent.	<b>DPI (NSW)</b> CSIRO PIRSA (SA) MLA AWI	\$3,529,436	\$1,294,084 Cash  \$2,235,352 In-kind
<a href="#">National Rabbit Biocontrol Optimisation</a>	Rabbit management is not about one-off applications of solutions but regular, community-based approaches drawing from a pipeline of new, existing and evolving solutions. This project aims to improve strategic knowledge about how to apply biocontrol agents to maximise rabbit biocontrol effectiveness, through monitoring and evaluation of current rabbit viruses in the Australian landscape.	<b>CSIRO</b> DPI (NSW) PIRSA (SA) MLA AWI	\$4,064,285	\$2,165,487 Cash  \$1,898,798 In-kind
<a href="#">Tilapia biocontrol: prospecting and evaluation</a>	Recently, the tilapia lake virus (TiLV) has caused widespread mortalities in Israel and Ecuador and has raised hopes of the potential for tilapia biocontrol. However, prior to significant research investment in assessing this particular disease, it is prudent to evaluate tilapia diseases in the context of biocontrol more broadly. Thus, this project proposes to conduct a desktop review of tilapia diseases and assess their potential as biocontrol agents. If one or more candidate agents are identified, then susceptibility of tilapia in Australian waterways will need to be determined followed by target specificity trials.	<b>DAF (Qld)</b> JCU	\$197,619	\$137,619 Cash  \$60,000 In-kind
<a href="#">Genetic technologies for pest animal control – developing a priority framework</a>	A powerful new tool called ‘gene drive’, overcomes 50/50 inheritance by duplicating itself during sexual reproduction, ultimately pushing itself into every member of a pest population. It works in mosquitos but will it work in vertebrates (mice, rats, carp)? This project will build a framework to assess the knowledge gaps that currently exist, the feasibility and a means to prioritize gene drive in our efforts to control vertebrate pest animals.	<b>CSIRO</b> DBCA/DPIRD (WA)	\$558,731	\$299,920 Cash  \$258,811 In-kind

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**COMMUNITY ENGAGEMENT DOMAIN:** Proposed solutions to invasive species management will fail unless landholders are sufficiently motivated and empowered to change behaviours and adopt new approaches. Our Centre has several projects to enhance community engagement within invasive species management and provide tailored and user-friendly information.

Title	Proposed project outcomes	Project partners	Total project funding	Funding contributions
<a href="#">National Wild Dog Management Coordinator Project</a>	The national wild dog coordinator project will continue to build on the platform for strategic management of wild dogs that has been developed over the past ten years.	<b>CISS</b> AWI MLA Animal Health Australia Wool Producers Australia Sheep Producers Australia Cattle Council of Australia DAF (Qld) DEDJTR (Vic) DELWP (Vic) DPIRD (WA) DPI (NSW)	\$2,352,920	\$927,545 Cash  \$1,425,375 In-kind
<a href="#">Behaviourally effective communication and engagement in the management of wild dogs</a>	Best practice community engagement requires a combination of practical 'soft skills' for facilitating dialogue and designing equitable processes, with in-depth understanding of the factors that prevent landholders from adopting best practices for managing wild dogs on their properties. This project uses behavioural science principles to assist wild dog facilitators to understand and engage more effectively with non-participating landholders.	<b>UNE</b> DPIRD (WA) MLA AWI	\$1,223,700	\$750,000 Cash  \$473,700 In-kind
<a href="#">Facilitating community adoption of digital resources - Feral Scan</a>	This project will facilitate community adoption of digital technologies including PestSmart and FeralScan community pest monitoring technology (with mobile Apps) and enhance this with community networking resources to ensure community and landholder needs remain front and centre of our organisation's business.	<b>DPI (NSW)</b> CISS AWI	\$1,524,000	\$1,080,000 Cash  \$444,000 In-kind
<a href="#">Upgrade of the PestSmart digital platform</a>	Our Centre now has a number of digital tools now developed including FeralScan, the Invasives Action Tool and species-specific Decision Support Systems and this project is about integrating all these resources to create a one-stop shop for invasive species management information in one place and to link out to other useful digital resources. As part of this project we are also aiming to incorporate weeds management information so it encompasses both invasive plants and animals.	<b>CISS</b>	\$500,000	\$500,000 Cash

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**NEW TOOLS DOMAIN:** In our management tools domain we currently have one project funded through our initial portfolio, however there are a number of projects funded through other external grants such as Ag White paper funding which are also feeding in to this topic. This includes our innovation in wild dog e-technology trapping and surveillance and new feral pig baits.

Title	Project snapshot	Project partners	Total project funding	Funding contributions
<a href="#">Feral deer aggregator</a>	This project will test the refined structure (the Deer Aggregator, DA) in areas with high densities of kangaroos and possums and feral fallow or red deer.	PIRSA (SA)	\$535,000	\$300,000 Cash  \$235,000 In-kind

**EDUCATION DOMAIN:** Our education program is building capacity among our PhD cohort to ensure they have the skills for the future workforce. Please note that specific PhD projects will be added to this section as they become available.

Title	Project snapshot	Project partners	Total project funding	Funding contributions
<a href="#">Balanced Researcher Program</a>	The Balanced Researcher Program creates multi skilled, industry ready graduates that can enter employment on graduation and actively contribute to the research and operational goals of their chosen workplace.	CISS	\$310,000	\$310,000 Cash

**WEEDS RD&E PORTFOLIO – UNDER DEVELOPMENT:** Our Centre is currently developing a national weeds RD&E investment plan, as such a minor portion of our current portfolio costs have gone towards developing this investment plan.

Title	Project snapshot	Project partners	Total project funding	Funding contributions
<a href="#">National Weeds RD&amp;E Investment Plan</a>	In providing its investment of \$20 million in the Centre for Invasive Species Solutions (the Centre), the Federal Minister for Agriculture and Water Resources requested the Centre to develop a 10-year Investment Plan for Weed Research, Development and Extension that aims to improve weed management in Australia. While the Investment Plan's main purpose will be to establish a ten-year national investment framework for weed RD&E, the consultancy process should also act to guide shorter-term Centre investment of around \$1 million over 2018-19 to 2021-22.	CISS	\$50,000	\$50,000 Cash