Biosecurity Surveillance Challenge

2022 NSW Small Business Innovation & Research Program

Background

The NSW Small Business Innovation and Research (SBIR) Program is a NSW Government initiative that provides competitive grants to small and medium-sized enterprises (SMEs) to find and commercialise innovative solutions to well-defined challenges identified by NSW Government agencies. This document sets out the Biosecurity Surveillance Challenge for the 2022 SBIR Program.

Challenge summary

The NSW Department of Primary Industries (DPI) is seeking innovative technology solutions that leverage the power of citizen surveillance to more accurately identify and validate threats to the biosecurity of primary industries and the environment in NSW.

Technology solutions might include, but are not limited to solutions to:

- Allow actively engaged citizens to easily and promptly report potential biosecurity concerns through digital forms
- Scan social media and other more passive 'postings' to identify potential biosecurity threats
- Filter citizens' reports to identify high-risk sightings and alert DPI to further investigation as appropriate
- Alert citizens to reports and biosecurity threats in their area
- In the case of a notified incursion, provide online platforms for citizens and industry to record sightings in new areas, on new hosts etc.

Challenge details

Biosecurity threats are increasing and outbreaks from exotic incursions are rising in volume, complexity and severity. This places significant pressure on the sustainability of NSW's $20 billion primary industries sector and the social and environmental amenity of the state. Biosecurity threats are highly varied, presenting logistical challenges for implementing effective surveillance for all threats in all locations via existing methods (e.g. species-specific traps, trained inspectors).

Biosecurity surveillance is critical to protect Australia's natural environment and primary industries from harms caused by insect pests, invasive species, and diseases of plants, livestock and fish. Surveillance programs are designed to detect threats early so they can be contained, managed and/or eradicated more effectively, reducing potential economic, environmental or social costs.

NSW has adopted a principle of shared responsibility to prevent and mitigate biosecurity threats effectively. NSW citizens play a central role in reporting and taking action to limit the spread of pests, disease and weeds. Citizens could be empowered with new technologies and services, including leveraging smart devices, to help in the early detection of biosecurity threats.

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Solution requirements

The solutions should deliver cost-effective technologies or methodologies that empower NSW citizens to contribute to biosecurity surveillance.

Proposals must:

- Demonstrate the scientific basis of the technology to address the problem
- Demonstrate that the technology can develop at least one element of a system to 'crowd source' biosecurity surveillance, such as the development of:
  - A process to screen records shared by citizens through social media, paper and electronic documents, video and audio files etc. for mentions, images or fortuitous records of symptoms, insect detections or occurrences that may be consistent with the presence of a biosecurity threat (passive surveillance)
  - A simple and user-friendly online reporting solution and portal (see iNaturalist, https://www.inaturalist.org/) for citizens to lodge potential records, which is deployable on common smart devices, and leverages location services and device cameras
  - Solutions using artificial intelligence and/or machine learning to help with identification and risk management at different levels
  - A triage process across all components to:
    - ensure that the highest priority risks, uncertainties and issues are immediately referred to trained scientific personnel at DPI for technical assessment
    - filter low-risk sightings and provide real-time feedback to the submitter
    - allow DPI to contact the submitter for subsequent identification and management purposes
  - A database to store records, collate and report information to DPI and immediately provide alerts to DPI in high-priority instances.
- Use cloud infrastructure or Software as Service (SaaS) where possible and function with the DPI Case Management System in accordance with Digital NSW policy.

This challenge is agnostic to the type of technology used and is seeking the most effective and efficient ways to support citizen biosecurity surveillance.

Applicants may propose a single technology or device, or an integrated suite of technologies and devices.

Benefits of the solution

If incursions and outbreaks continue to increase, eradication efforts alone will cost the NSW Government an estimated additional $1.98 billion, and the associated costs of a significant incursion would be orders of magnitude higher. For example, it is estimated that a single widespread khapra beetle outbreak would cost the NSW economy almost $670 million in the first two years alone.

A digital reporting solution based on smart devices would empower citizens with the ability and confidence to report potential biosecurity threats and educate and inform the public of local or high-risk

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threats. Ultimately, the solution will provide another layer of biosecurity protection for NSW's high value primary production.

Technology of this kind could be minimally modified to perform the same function in other Australian states and territories and, with more extensive modification, in other countries. Similarly, it could be modified to search records for rare and endangered insects or monitor for beneficial insects etc. More broadly, lessons learned and technological surveillance methods produced as part of this program could potentially be applied to diverse sectors, including health, defence and trade.

How to apply

Applications to the NSW 2022 SBIR Program will be made through the smartygrants platform, Online applications forms can be found at https://chiefscientist.smartygrants.com.au/SBIR2022Round.

 For more information, please visit chiefscientist.nsw.gov.au/sbir