

Background

The NSW Small Business Innovation & Research (SBIR) program is an initiative of the NSW Government that provides competitive grants to small and medium-sized enterprises (SMEs) to find and commercialise innovative solutions to well-defined problems for NSW Government agencies. Further information about the SBIR program is available on the Office of the NSW Chief Scientist & Engineer website. This document sets out the Koala Count Challenge for the 2021 SBIR program.

Challenge summary

The Department of Planning, Industry and Environment is seeking technology solutions to more rapidly and effectively quantify the number and geographical extent of koalas.

Technology solutions might include, but are not limited to:

- Remote sensing such as thermal imagery from drones, unmanned aerial vehicles or satellites
- Image processing and AI to identify koalas in real time
- Acoustic monitoring
- Systems that automate data collection, classification and storage, and provide online access to real time data.

Overview of challenge

Koalas are a threatened species in NSW. The NSW Minister for Energy and Environment has set a goal of doubling koala numbers in NSW by 2050. To determine if this goal has been achieved, we need to understand the number and extent of koalas in NSW, and to monitor those koala populations over time.

Koalas are cryptic animals and are notoriously difficult to find and count, thus our current methods of counting koalas and estimating density of populations are expensive, resource-intensive, require specific weather conditions and are challenging to scale. Current methods include field surveys (spotlighting and scat surveys), song meters, community surveys and drones. Surveys are often biased towards areas that are more heavily populated or frequented by humans. For example, koala sightings are often reported along roads, where people are present to observe them.

There are many areas of NSW with identified koala habitat that have never been surveyed. New technologies such as thermal imagery from drones and acoustic monitoring arrays offer rapid solutions to collect large volumes of data, which is a big improvement over existing field methods. However, these technologies have limitations and further innovation is necessary.

Koalas are rapidly declining and were further impacted by the 2019-20 bushfires. Swift action is needed to reverse this decline. The challenge is to find an accurate, practical, cost-effective and scalable way to count koalas across NSW. To conserve koalas, we need to have an accurate count of koala populations across NSW, to enable the monitoring of population increases or decreases over time. The challenge solution will give us the tools to show whether, where and when koala numbers are increasing or decreasing. This will provide vital information on the effectiveness of our actions and help us to improve future strategies.

Solution requirements

We need a consistent, accurate, practical, cost effective and scalable solution to better detect and count koalas that can be applied state-wide in a relatively short time frame to determine the current status of the population and regularly track progress. The solution should comprise both the technology and the method for applying that technology to count koalas.

Proposals must:

- describe the scientific basis of the technology to address the problem
- demonstrate that the technology and method:
 - can be applied at various spatial scales (small-scale local site up to landscape/LGA-wide area)
 - can be applied all year round
 - can be applied over different terrains (including valleys and remote areas with limited access)
 - can be used across all tenures
 - are cost-effective and scalable
 - are highly automated, requiring little to no human input
 - produce reliable, repeatable and consistent results.
- include robust statistical methods where relevant
- deliver sharable, reliable and useful data
- have regard to the NSW Koala Strategy.

This challenge is agnostic to the type of technology used and is seeking the most effective and efficient technology and methodology. Applicants may propose a single technology or device, or a suite of technologies and devices that are integrated.

Proposed solutions that could also capture related koala or ecosystem data will be highly regarded, for example, solutions that can identify koala joeys, sick koalas or koala habitat.

Proposed solutions that could also be adapted to count populations of other animal or plant species (in NSW, Australia or internationally) will be highly regarded.

Benefits of the solution

Reliable data is essential in ensuring we can protect and grow koala populations. The koala count data could be used to further build the koala habitat information base and to inform conservation and management actions. A flexible solution could also be used for monitoring a wide range of other fauna and flora, including many endangered species or pests in Australia and internationally. Such a solution would be of great value to governments, non-government organisations and private landholders in Australia and overseas for activities such as conservation management, pest control and assessments of biodiversity and land-clearing proposals.

How to apply

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