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NATIONAL KOALA MONITORING PROGRAM

The National Koala Monitoring Program (NKMP) aims to fill knowledge gaps for future Koala recovery and management efforts. CSIRO is leading the co-design of the four-year program and facilitating the roll out of NKMP with the broader Australian community. The key objectives of this monitoring program are:

- Inclusive – to enable all members of the Australian community to contribute to this national koala monitoring effort.
- Long-term – to build individual and collaborative capacity to collect robust data that can be used for evidence-based decision-making.
- Integrative - to build best-practice methods and data management systems to integrate available and new data to provide local and national insights into koala population status and trends.

The NKMP uses a wide range of approaches to monitoring koalas. This enables us to use a wealth of existing knowledge and suit our data collection methods to the specific needs of each site.

Keen to learn more? Visit National Koala Monitoring Program. Any questions or keen to find out how you can share your koala observations or data? Contact us at KoalaMonitoring@csiro.au

KOALA MONITORING PARTNERSHIPS WITH FIRST NATION GROUPS

Aboriginal and Torres Strait Islander ('First Nation') people hold a system of kinship and knowledge about plants, animals, and places in our environment. Koalas are an integral part of many Indigenous bio-cultural landscapes and for some First Nation groups they are an important totem for Country.

There are now many examples of koala monitoring partnerships and programs across Australia. These can be broadly categorised as First Nation knowledge sharing and building; knowledge sharing; and koala data collection. In some cases, there is a mix of these categories supported.

- **First Nation koala knowledge building and sharing** – partnerships support First Nation individuals / groups to share koala knowledge within First Nation communities.
- **Koala knowledge sharing** – knowledge about koalas and habitats is shared between First Nation individuals/ groups and scientists.
- **Koala data collection** – First Nation individuals and/or groups collect data about koalas using a range of monitoring (eg citizen science, drones, transects etc) using western science survey methods.

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CULTURAL AND FIELDWORK SAFETY

The first component of these protocols focuses on cultural and fieldwork safety. While koalas are easy to identify, they can be hard to find and monitor and often may not have been seen in the local area for many years. There may be patchy knowledge about local koala populations and some uncertainty about local and scientific knowledge about population status and trends. This protocol outlines some key occupation, health, cultural and physical safety issues to guide fieldwork and knowledge building efforts.

Cultural safety is important so that First Nation people and their knowledge are treated the right way and are empowered to set the conditions under which good knowledge sharing can occur. Our knowledge our way offer practical guidelines to inform this effort.

Fieldwork safety is also important, and details can be found in other methods on this website. This includes need for appropriate field gear such as sturdy walking shoes/boots, hat, suitable long pants and long-sleeved shirt. For some monitoring methods it is important to bring enough water and food to spend a few hours away from a car. Basic first aid kit (including compression bandages for snakebite) is also important to have on site. If working at night, consider bringing a back-up headtorch in case batteries fail. Marking equipment like UHF radios or rangefinders with a bit of reflective tape is helpful if you drop them in the dark. Wearing some reflective item on your clothing will also help your colleague locate you if your light stops working.

Training and gear assessment will need to be assessed depending on the type of First Nation koala monitoring collaboration. Training and gear assessment for First Nation koala knowledge building and sharing might be focused on conducting and (video or voice recording) interviews, as well as ways to ensure this material is safely stored. Koala knowledge sharing between First Nation individuals/ groups and scientists might include mixed monitoring methods that might require some training and gear (e.g. how to view and record a koala using binoculars and a koala spotter app) and also some training for First Nation and/or science team members training required to learn from the expertise offered by local Elders. Advanced technical equipment, such as camera traps, acoustic recorders and drones, require more resources, training and expertise. Koala data collection partnerships might require sharing equipment and expertise so that local First Nation individuals and/or groups can collect data about koalas using a range of science survey methods (Figure 1).

To get a good estimate of a species' population size, or to detect relative changes in that size over time, we need to conduct systematic surveys. A systematic survey will record both the number of animals seen and the amount of effort it took to find those animals (e.g., distance walked, time spent searching, area covered). Monitoring that requires walking can be hard work and are sometimes not doable

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for safety or logistic reasons. If there are trails available, it makes good sense to use them where possible. However, consider the impact on the data you are collecting and how representative it will be. If you only ever survey along a road or track, you are essentially carrying out a survey of koalas that are near roads or tracks, not necessarily giving the full picture of where koalas are present in the broader habitat.

If you are following an NKMP survey design, you will be provided with an ordered list of sampling points within a cluster. Start by selecting the first point in the list. If that point is not accessible for safety or logistical reasons, move down the list to the next point and so on until you find an accessible survey point. You can do this initial assessment either on country or looking at Google Maps. Once you are at the survey point, walk a single long transect, or multiple short transects, for two to three kilometres and record any sightings or if there were no sightings (see the Walking Transects methodology for more details).

Figure 1: **Koala survey partnerships between the NKMP and First Nation groups support local and national koala survey methods and priorities.**

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If you are not following the NKMP or some other sampling design, think carefully about where you choose to survey. Typically, people tend to look for koalas in places where they think they are likely to find them. To get a clear picture of where koalas are in your landscape and what their population numbers are, partners might consider surveying a range of different habitats that may have koalas but also may not or where Elders remember where koalas once were. This includes searching for koalas in the trees, but also checking tree trunks for scratches and scat at the base of trees. Confirming that there are no koalas in an area where nobody has looked for before or for some time is a concern but is valuable information. Other sites that are important to First Nation partners might also be selected for monitoring. In either case, ensure appropriate permits and permissions from land holders and Elders are obtained before surveying area.

PARTNERSHIP AGREEMENTS

The second component of these best practice protocols focuses on **partnership agreements**. Partnership agreements help ensure scientists engage with local First Nation knowledge holders as collaborators, who have expertise that requires intellectual and cultural property and knowledge sharing and protection protocols to be negotiated. This agreement also helps First Nation collaborators understand the intellectual property and knowledge sharing protocols scientists are expecting from koala monitoring collaborations. A partnership agreement reflects the agreed purpose, roles and responsibilities of koala monitoring collaborations.

A partnership can be negotiated with First Nation individuals or organisations. Partnerships might need to be negotiated with organisations who represent a First Nation Group (e.g. a Prescribed Body Corporate or Land Council) who have governance authority over areas where koala monitoring activities are taking place. Partnership agreements also might be negotiated with First Nation individuals or organisations that are gathering, sharing or building knowledge needed to monitor koala populations and/or habitats. This might require the monitoring team to take a proposal for Board consideration and approval.

Indigenous knowledge holders about koalas might not be able or willing to share this knowledge or may have conditions under which some of this knowledge might be shared and/or made public. Indigenous knowledge can be broadly defined as the knowledge that an Indigenous clan or community accumulates over generations through living and caring for a particular environment. This knowledge is known and held by individuals for the benefit of the clan or community and is governed by cultural laws and practices. This knowledge might include knowledge about koalas and their habitats. Indigenous knowledge also includes the know-how skills, practices, and beliefs (Figure 2).

When negotiating partnership agreements, it is important to spend the time to

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discuss and ensure collaborators have free informed and prior consent that includes how **Indigenous Cultural and Intellectual Property** (ICIP) and how other (e.g scientist's) intellectual property will be respected, shared and protected. Indigenous Cultural and Intellectual Property (ICIP) means the cultural heritage of Indigenous people which comprises all objects, sites and knowledge, the nature or use of which has been transmitted or continues to be transmitted from generation to generation, and which is regarded as pertaining to a particular Indigenous group or territory.

***Figure 2:* Koalas are significant species for many First Nation groups.**

INDIGENOUS DATA SOVEREIGNTY AND DATA GOVERNANCE

The third component of these protocols focuses on **Indigenous data sovereignty and data governance**. This includes when and how FAIR (Findability, Accessibility, Interoperability, and Reusability) principles guide when and how koala data is shared freely to all. Partnerships should also consider CARE (Collective Benefit, Authority to Control, Responsibility and Ethics) principles that highlight the necessity of considering Indigenous data sovereignty and shared benefits to inform if, how and why koala data is shared, as well as the need to situate these agreements in order to reflect local contexts. CARE principles can be applied to data collection, integration, analysis and translation practices that are key to koala monitoring programs (e.g. see Responsible Innovation with CARE principles of Indigenous data governance). This can include the negotiation of who decides what koala data is shared (or not), when, for what purpose, and under what conditions.

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The NKMP program has created different data governance systems that have been negotiated to include several layers of privacy. An outermost data ring is restricted to Traditional Owners and Indigenous elders, who identify which data can be made available to the inner rings. The data in the second ring can be accessed by researchers and selected collaboration partners. The innermost ring is data that can be made available to the public. This data governance has been applied in other cross-cultural monitoring contexts.

DATA FROM FIRST NATION GROUPS

Data is collected according to the advice and guidance of the Traditional Owners in regard to what is important to them from a land management perspective. This may include information about the presence or absence of animals, or information about the condition of different types of grasses and trees.

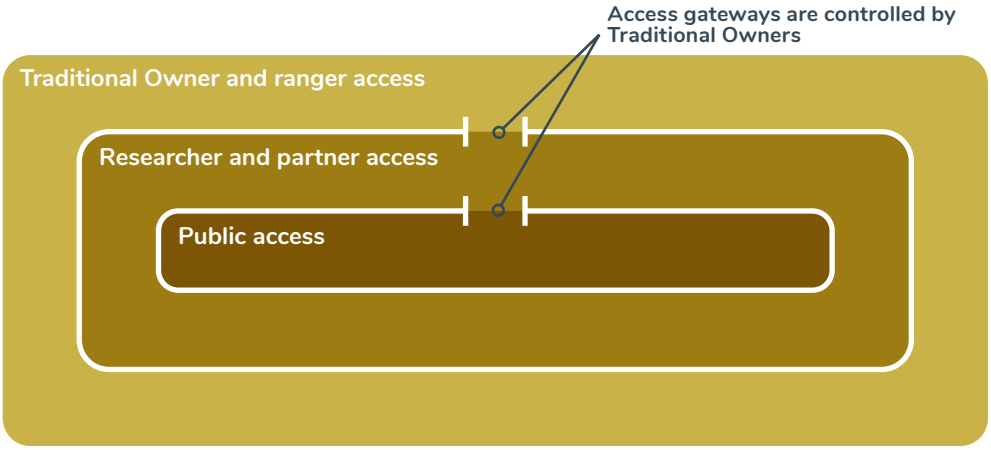
The results and analysis are delivered to rangers via a Power BI dashboard that was designed in partnership with the Traditional Owners. Rangers can use the dashboard to support their decision making regardless of where they are based.

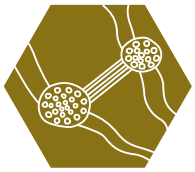
DATA GOVERNANCE

Data governance in this context involves several layers of privacy, as some of the sites where the drones collect data are sacred to the Traditional Owners. As such, imagery and data from those sites needs to be properly protected.

The platform features three rings of data management and data governance:

- The largest, outermost data ring is restricted to Traditional Owners, rangers, and Indigenous elders, who identify which data can be made available to the inner rings.
- The data in the second ring can be accessed by researchers and collaboration partners.
- The innermost ring is data that can be made available to the public.





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Consent needs to be ongoing and can be revoked at any time.

Local context matters. The agreements and the processes need to be negotiated every time.

ACKNOWLEDGEMENTS

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