Australian Government
Department of Climate Change, Energy, the Environment and Water

CSIRO

Atlas of Living Australia
ala.org.au

Habitat Condition Assessment Tool: Using expert knowledge to improve our understanding of Australia's native ecosystems

The Habitat Condition Assessment Tool (HCAT) is a web-based platform where experts with deep ecological knowledge can share and record information on site-level ecosystem condition. It will help extend a library of site condition observations from across Australia to support research, conservation planning, monitoring, and reporting.

Leveraging expert knowledge for ecosystem condition assessments

The HCAT is a web-based tool that uses expert elicitation to gather information about the condition of Australian ecosystems. It was developed by CSIRO in collaboration with the Australian Government and the Atlas of Living Australia (ALA) and is hosted by the ALA's BioCollect information system. Using the HCAT, local ecosystem experts delineate sites they are familiar with and provide an overall site condition score between 0 and 1 (a Site Condition Assessment). Experts also estimate condition scores for a small number of photos exhibiting ecosystems in various condition states (Image Assessments). These Image Assessments are used to calibrate Site Condition Assessments across experts so that they can be directly compared. This approach provides a reliable and effective method for collecting and preserving expert opinion on ecosystem condition and to enable these assessments to be compared across Australia in a consistent way.

Contributions to HCAT will be used in a range of applications, including the ongoing development of the Habitat Condition Assessment System (HCAS), which uses satellite remote sensing and site data to estimate ecosystem condition across the Australian continent. Data collected via HCAT informs HCAS by providing contemporary examples where ecosystems are relatively intact, as well as sites where ecosystems have been modified. HCAT data may also be used to improve ecosystem state and transition models such as those implemented through the Australian Ecosystem Models Framework, as well as potentially informing other ecosystem monitoring and restoration intervention programs.

Sites may be small or large, in any terrestrial ecosystem in Australia (photo credit K. Giljohann)

What is ecosystem condition?

Ecosystem condition refers to the capacity of lands, coasts, wetlands or waterways to support the native plants and animals that would exist there if the ecosystem maintained a high level of integrity.

A score of '1' applies to a site with high ecosystem integrity within its natural range of variability, as might have existed prior to European colonisation, and its characteristic composition, structure, functioning, and self-organisation are intact. Conversely, a score of '0' applies to a completely transformed site in which all native species have been removed, and the site's functioning and self-organisation are entirely different compared to any of its original characteristic forms.

What does expert elicitation involve?

Experts are established ecologists and natural resource management professionals or naturalists with substantial ecological, botanical and field knowledge and experience in at least one Australian region and native ecosystem type, across our lands, coasts, wetlands or waterways.

Within the HCAT, experts nominate the broad ecosystem type(s) and geographic region(s) for which they have expertise. This information is used by the HCAT to assign images for calibration purposes. Experts then delineate sites and enter their overall site condition scores for each location, as well as scores for four key ecosystem condition characteristics. Optionally, experts are invited to provide details of the anthropogenic drivers of condition at each site.

Intellectual property of contributed information remains with the expert and, by engaging in this process, the expert agrees that their contributed data will be made freely available, thereby allowing that information to be placed in the public domain for others to use without asking permission. Experts decide whether their name is associated with their contributions.

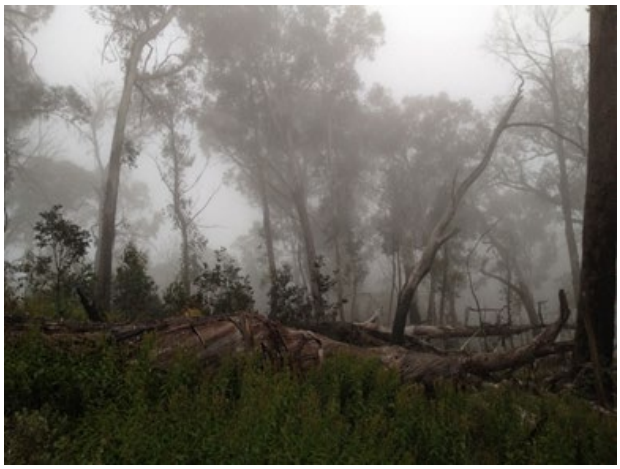
Detailed instructions and online training materials are provided to guide experts toward a common interpretation of the data capture process.

HCAT improvements

The HCAT was first tested by participating experts and professionals in 2018. Based on their feedback, the HCAT has been updated to streamline and modernise the platform and prepare it for a large-scale roll-out.

Key improvements include:

- **Faster HCAT access:** Streamlined and automated HCAT registration for faster access.
- **Improved navigation:** Updated website layout for easier use.
- **Expert consistency:** Provided more detailed instructions for consistent assessment understanding.
- **Flexible uploads:** Offered additional options for bulk uploading site condition assessment data.
- **Standardised definitions:** Aligned condition, ecosystem characteristic, and threat definitions with national/international guidelines.
- **Enhanced scoring:** Refined scoring systems for more rigorous statistical analysis.



For more background, view the products from the first HCAT expert elicitation here (photo credit K. Giljohann)

How can I contribute?

The HCAT project team is inviting experts across Australia to contribute site assessments. In partnership with the Ecological Knowledge System for the Nature Repair Market, HCAT will be introduced to potential participants through a rolling series of elicitation campaigns and workshops in high-priority regions and ecosystems. The HCAT is also open for other experts to contribute based on their expertise. If you would like to participate, read the participant information sheet which outlines the risks and benefits, or contact the HCAT team for more information at expertconditionassessments@csiro.au.

Contact us

Email: expertconditionassessments@csiro.au

Publications: https://research.csiro.au/biodiversity-knowledge/projects/expert-knowledge-biodiversity/

Learn more about HCAS and other CSIRO ecosystem monitoring and accounting systems here (photo credit K. Giljohann).

For further information

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