

Fire-affected invertebrates: Priority species and management response

Project Summary
Project 8.3.1



National Environmental Science Programme



*The entire known range of the Kangaroo Island assassin spider (*Zephyrarchaea austini*) was burnt at high severity. The species lives in leaf litter suspended amongst understorey vegetation and very little of its habitat remains following the fires. Image by J. Marsh*

Research in Brief

The project seeks to (i) develop a justified listing of those invertebrate species most affected by the 2019–20 Australian wildfires in southern and eastern Australia, and whose recovery is most needing management support; and (ii) identify the post-fire threats and management priorities for those species. The project may also help develop monitoring guidelines and provide support for the development of submissions for threatened species listings for priority invertebrate species. It extends from an initial priority listing of fire-affected invertebrates first developed for the Wildlife and Threatened Species Bushfire Recovery Expert Panel, and will build upon and consolidate the extensive collaboration with experts and state agencies developed during that project.

Why is the research needed?

Invertebrates are likely to be amongst the species most affected by the 2019–20 wildfires. This is because of the large number of invertebrate species, many which have very small ranges (such that fires may have affected entire populations), and with ecological and life history traits that render them especially susceptible to fire. However, there are major knowledge gaps that render assessment of such impacts particularly challenging.

The project aims to use a collaborative approach, extending on the initial priority listing of fire-affected invertebrates, first developed for the Wildlife and Threatened Species Bushfire Recovery Expert Panel to identify those invertebrate species (or in some cases, other taxonomic levels) that have been most detrimentally affected by the 2019–20 wildfires, and hence those

most in need of priority management response. Such further consideration is appropriate because of the many substantial challenges in describing the impacts of these fires on invertebrate species.

How will the research help?

The project will, to the extent possible, interrogate all accessible and useful distributional information for all invertebrates in the bioregions affected by these wildfires, (where possible) modelling these distributions, and calculating overlap with fires of varying severity classes. Given constraints in the distributional information, it will complement this approach with expert opinion, and work with experts to detail information on ecological and life history traits that relate to species' susceptibility to fires, their post-fire threats and their remedial management requirements.



The project aims to help align recovery actions (and survey and monitoring) to priority needs of the most fire-affected invertebrate species. It will do so by extending and refining the species' prioritisation currently used to help direct funding support by the Australian government to wildlife and threatened species bushfire recovery.

The project is working with the Australian and state/territory agencies to collaboratively develop and justify prioritisations for fire-affected invertebrate species and provide relevant information on those management actions most likely to aid their recovery. This will build from and add much detail to the priority listing developed for/ by The Wildlife and Threatened Species Bushfire Recovery Expert Panel in March–April 2020.

What research activities are being undertaken?

The research will mine appropriate distributional databases (most notably ALA) to use all possible acceptable records for all native invertebrate species that are known to occur within fire-affected bioregions; develop distributional models (or analogous range estimators)



The Kangaroo Island micro trapdoor spider (Moggridgea rainbowi). This species was heavily impacted by the 2019–20 bushfires. Image by J. Marsh



Burnt burrows of the Kangaroo Island micro trapdoor spider (Moggridgea rainbowi) at Western River Wilderness Protected Area. This species is endemic to Kangaroo Island and the whole known western range of the species was impacted by high severity fires. Image by J. Marsh

for selected subsets of these; overlap these distributional layers with fire-mapping (with fire severity classes); work with experts and literature to develop databases of traits affecting fire-susceptibility, threats and management; and coordinate progress and procedures with comparable analyses undertaken by state/territory agencies.

Who is involved?

In this project, researchers from Charles Darwin University and The University of Melbourne are working with state and territory governments within the areas affected by the 2019–20 fires. We will seek collaboration with all willing invertebrate experts and federal and state/territory agencies.

Where is the research happening?

The project is essentially a desktop analysis. Depending upon travel constraints due to COVID-19, the project is also seeking to draw experts and state agency representatives to at least one workshop. The research will pertain to all fire-affected regions of southern and eastern Australia.

When is the research happening?

The project will run over eight months from July 2020.



Large Eastern Bronze Azure Butterfly (Ogyris halmaturia) whose populations on Kangaroo Island were heavily impacted by fire. Image by R. Glatz

Further Information

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