

Impact of experimental forest fragmentation and fire on the funnel-web spider, *Atrax sutherlandi*.

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The following is an excerpt from a longer piece. For full text, please visit https://scholar.colorado.edu/concern/undergraduate_honors_theses/mk61rj17t

Abstract

Habitat fragmentation is one of the leading causes of biodiversity loss and in many regions of the world, climate change now interacts with habitat fragmentation in, as yet, unknown ways. The Wog Wog habitat fragmentation experiment, located in New South Wales, Australia, is one of the longest experiments of its kind, running for over 35 years. The experiment provides an excellent opportunity to examine the effects of habitat fragmentation on population changes over long time scales. In this project, I am studying the impacts of both habitat fragmentation and the Australian Black Summer Fires of 2019-2020 on the population of the funnel-web spider, *Atrax sutherlandi*. The fires burned for more than four months, burning more than 45 million acres of land, 30 million of which were forested, including Wog Wog. These bushfires are estimated to have killed over one billion invertebrates. I created models to examine differences in pre- and post-fire presence and abundance in fragments versus continuous forest using data collected post-fire and for five years before the fires. Here we show that habitat fragmentation and fire do not interact to impact the funnel-web spider. Our results show that funnel-web presence and abundance did not differ before or after the fires or in habitat fragments compared to continuous forest. A potential explanation for the lack of an impact of fire is that funnel-webs live in burrows in the ground, which may protect them from fire. Also, a previous study from Wog Wog shows that habitat fragmentation did not impact funnel-web abundance in the period of time before the fire, likely because the spiders are generalists and invertebrate food webs remained intact in habitat fragments. Future studies should follow funnel-webs as the burned fragment communities continue to recover.

