Progress Report STP 2018-087 (FY 2020-2021)

Fire intensity, seasonal variation and seeds traits may influence seed fates in banksia woodlands

BCS Fire Science

Project Core Team

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Project Team	granted
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Progress Report

In fire-prone ecosystems, recruitment from seeds following fire provides a pathway for populations to persist through fire. For many species, recruitment from seed is their only means of population recovery following fire events, so seed survival through fire is vital in order to maximise post-fire recruitment. This project aimed to measure temperatures within soil during fire, examine lethal tolerances of seeds to elevated temperatures associated with fire, establish interactions between lethal tolerances and emergence behaviour and predict weather conditions that may decrease seeds ability to survive fire events.

Key outcomes are: 1) a new method for measuring soil temperatures during fire using distributed temperature sensing within optic fibre to sample spatial and temporal patterns; 2) a negative relationship identified between seed moisture and lethal temperature thresholds; 3) analysis of fuel loads and temperature penetration into soils, the depth from which seeds can emerge from soils and their lethal temperature thresholds, and; 4) analysis of seasonal patterns of soil moisture and seed vulnerability to lethal temperatures. Findings include that while larger seeds can emerge from deeper within the soil, they are no better at surviving elevated soil temperatures, lethal temperatures are influenced by seed moisture which, in non physically dormant species, varies with season.