

HOW DOES FUEL REDUCTION BURNING INFLUENCE FOREST CARBON STORAGE?

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What is the problem?

We do not know the “carbon cost to the atmosphere” of fuel reduction burning (FRB) in our forests. For example, what are the effects of FRB on the carbon held in soil, litter and vegetation in forests? How does organic matter in the surface and upper layers of soil change after FRB? How are rates of carbon turnover affected by FRB?

To answer these questions we must measure the amount of CO₂ released by FRB from forests — both during the burn and in the months and years after.

We must also measure the impact of FRB on the longevity of forest carbon. The most important fixed carbon stores influenced by FRB are in litter and soil.

Regrowth of vegetation following FRB also determines the carbon uptake capacity of the forest.

Addressing the problem

This project will measure the carbon content of the living vegetation, the wood and litter on the forest floor and in the surface soil before and after FRB.

A range of forest types and fire intensities will be investigated to enable prediction of carbon losses.

Vegetation, wood and litter will be measured before and after experimental burning using standard inventory techniques to account for ash and charcoal production.

Soil carbon will be measured using a range of techniques including benchmark chemical analysis, fractionation of soil organic carbon, mid infra-red spectroscopy and isotopic analysis. However, it is important that a rapid and cheap method for analysis of soil carbon is developed to increase statistical power and modelling capacity.



Expected outcomes

1. Greater understanding of the impact of FRB on the carbon balance in forest vegetation and soils
2. Management of FRB to minimise carbon loss to the atmosphere and predict impacts of FRB on carbon storage capacity of forests
3. Supply of critical information needed to predict net CO₂ release (i.e. increase, decrease, no change) from burnt and unburnt forests over a range of timescales (days, years, decades)

How much carbon is there in the vegetation, litter, wood and soil in this forest?

