

**Concept Plan SP 2012-036**

# **Fire behavior and fuel dynamics in coastal shrublands**

**Ecosystem Science**

## **Project Core Team**

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**Project status as of June 17, 2016, 12:04 p.m.**

Update requested

**Document endorsements and approvals as of June 17, 2016, 12:04 p.m.**

**Project Team**

required

**Program Leader**

required

**Directorate**

required

# Fire behavior and fuel dynamics in coastal shrublands

## Science and Conservation Division Program

Ecosystem Science

## Parks and Wildlife Service

Service 6: Prescribed Burning and Fire Management

## Background and Aims

### Expected outcome

### Strategic context

Shrubland ecosystems are widespread in south-west Western Australia, and are the predominant vegetation type in coastal areas between Geraldton and Esperance. Coastal shrublands are renowned for their flammability, and fires can be fast moving and intense when dead fine fuels are dry and wind speeds exceed 15 km/h. A characteristic feature of fire behavior in shrublands is the abrupt and drastic escalation in fire behavior that takes place as fire transitions from the litter layer to the shrub canopy layer. The transition from surface to crown fire behavior is determined by fuel dryness, wind speed, and the structure and continuity of the vegetation itself (Cruz et al. 2012). This characteristic fire behavior makes shrublands a problematic fuel type in which to apply prescribed fire: if conditions are too mild then fire does not sustain and burn enough of the vegetation to create an effective fuel-reduced zone; at the other extreme, small changes in weather conditions can lead to fires burning with uncontrollable intensity.

Currently, DEC does not have a fire behavior guide specific to coastal shrublands. Practitioners must therefore rely on experience alone, or on predictions and indices adapted from fire behavior guides developed for other vegetation types such as forest, grassland or semi-arid mallee-heath. This represents a serious gap in science-based decision making, and potentially exposes individuals and DEC to significant risk in the event that fires do not behave as expected. These issues were highlighted by the Special Inquiry into the November 2011 Margaret River bushfire conducted by the Hon. Mick Keelty.

### Expected collaborations

This project will build on existing collaborations with CSIRO Ecosystem Sciences and the Heathland Fire Behaviour Group convened by Dr Wendy Anderson of the University of NSW. This group has an established record of collaborative research and publication based on collation and analysis of data from researchers in Australia, New Zealand, Spain and Portugal (e.g. Catchpole et al. 1998[1], Cruz et al. 2012[2]). Other potential collaborators include the Bushfire Cooperative Research Centre, and researchers from Murdoch University who have undertaken fire behavior experiments in kwongan shrublands on the northern sandplain under an ARC linkage grant.

[1] Catchpole, W., R. Bradstock, J. Choate, L. Fogarty, N. Gellie, G. McCarthy, L. McCaw, J. Marsden-Smedley and G. Pearce (1998). Cooperative development of equations for heathland fire behaviour. In: Proceedings of the 11th International Conference on Forest Fire Research, 16-20 November 1998, Luso, edited by D. X.Viegas. University of Coimbra, Portugal. pages 631-645.

[2] Cruz, M.G., McCaw, W.L., Anderson, W.R., Gould, J.S. (2012). Fire behavior modeling in semi-arid mallee-heath shrublands of southern Australia. Environmental Modelling and Software. doi: 10.1016/j.envsoft.2012.07.003.

### Proposed period of the project

None – None

### Staff time allocation

Role	Year 1	Year 2	Year 3
Scientist			

Role	Year 1	Year 2	Year 3
Technical			
Volunteer			
Collaborator			

### Indicative operating budget

Source	Year 1	Year 2	Year 3
Consolidated Funds (DPaW)			
External Funding			