



Australian Government

PUAFIR512 Develop and analyse the behaviour and suppression options for a Level 2 wildfire

Release 2

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Modification History

Release	TP Version	Comments
2	PUA12 V2.1	Editorial changes.
1	PUA12 V2	New unit.

Unit Descriptor

This unit covers the competency required to provide an analysis of the spread and behaviour of an intermediate wildfire and to prepare fire suppression options that are appropriate for the expected fire behaviour.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Application of the Unit

This unit applies to personnel required to provide fire behaviour and spread predictions for consideration by the Incident Management Team.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a Unit of Competency.

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the Range Statement. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT

PERFORMANCE CRITERIA

1. Analyse factors impacting on the spread and behaviour of an intermediate wildfire and develop an incident prediction

1.1 Information on the current and future fire spread and ***fire behaviour*** is collected from a range of ***sources*** and recorded.
1.2 Analysis is conducted using ***consideration of fuels and fuel assessment, weather analysis, the effects of topography*** and likely resultant fire behaviour.
1.3 Fire prediction tools and references are effectively utilised in the analysis of fire spread and behaviour.
1.4 Results of the fire behaviour analysis are validated against fire observations as they become available.

2. Develop maps and data, and maintain associated information regarding projected fire spread and behaviour

2.1 Necessary ***map information and data*** is prepared.
2.2 Fire spread and behaviour projections are developed in a manner appropriate to the incident.
2.3 Use of the information in planning the control of the incident is facilitated through quality, timeliness and presentation of the information.
2.4 Fire spread and fire behaviour projections are updated as new weather and fire information becomes available.

3. Analyse and communicate key risks of the projected fire spread and behaviour

3.1 Site information is sought from agency databases or experts.
3.2 Area and timing of potential future impact of the fire is projected.
3.3 Key ***risks*** of the fire to ***human, economic and environmental assets*** are considered.
3.4 Fire and weather are monitored to assess if or when fire danger is likely to suddenly increase.

4. Prepare and analyse a range of fire suppression options consistent with

4.1 Range of options with an analysis of probable level of success and consequences of failure is prepared

incident objectives

- for consideration by the Incident Management Team.
- 4.2 Time available and the threshold fire behaviour for which each **strategy** and **tactic** is likely to be effective are considered.
- 4.3 Projected changes to or variation in fire behaviour conditions (due to fuel, weather, topography, fire size) are considered.
- 4.4 Advice and analysis are provided to the Incident Management Team to assist in development of strategies and fallback strategies.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level, required for this unit.

Required Skills

- access and interpret weather products
- implement strategic risk analysis techniques
- interpret fire spread source data
- manage data and maintain accurate records
- understand and interpret topographic maps in order to plot potential fire spread
- use fire prediction tools and suppression guides

Required Knowledge

- categories of risk
- conditions suitable for and the limitations of fire suppression strategies
- effects of topography on fire behaviour
- fire behaviour factors
- fire suppression strategies and tactics
- fire weather
- fuel and fuel assessment
- sources of data relating to fire behaviour

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Assessment must confirm the ability to:

- provide (for use by the Incident Management Team to plan the control of an intermediate wildfire):
 - accurate analysis and projection of fire spread and fire behaviour, indicating probable and possible scenarios
 - analysis of a range of appropriate fire suppression options

Consistency in performance

Competency should be demonstrated over time in actual or simulated wildfire incidents.

Context of and specific resources for assessment

Context of assessment

Competency should be assessed in a range of actual or simulated wildfire incidents.

Specific resources for assessment

Access is required to:

- range of actual or simulated fires
- range of sources of information related to fire spread and behaviour
- agency templates for fire behaviour prediction

Method of assessment

In a public safety environment assessment is usually conducted via direct observation in a training environment or in the workplace via subject matter supervision and/or mentoring, which is typically recorded in a competency workbook.

Assessment is completed using appropriately qualified assessors who select the most appropriate method of assessment.

Assessment may occur in an operational environment or in an agency-approved simulated work environment. Forms of assessment that are typically used include:

- direct observation
- interviewing the candidate
- journals and workplace documentation
- third party reports from supervisors

- written or oral questions

Range Statement

The Range Statement relates to the Unit of Competency as a whole. It allows for different work environments and situations that may affect performance. ***Bold italicised*** wording in the Performance Criteria is detailed below.

<i>Fire behaviour</i> must include:	• fire perimeter • fire size/growth/shape • fire whirls • flame characteristics (height and depth) • heat output and intensity • junction zones • rate of spread • smoke • spotting
<i>Sources</i> may include:	• air or ground observations • automated weather stations • Bureau of Meteorology websites and/or fire weather experts • fire history maps • fuel type maps • fireground information, operational situation reports and infrared scans • geographic information systems (GIS) and agency site-related databases • land managers • persons with local knowledge
<i>Consideration of fuels and fuel assessment</i> may include:	• bark fine fuels • canopy fine fuels • coarse fuels • coarse standing fuels • coarse surface fuels • dead coarse fuel moisture • dead fine fuel moisture • elevated fine fuels • fine fuels • fuel and fire behaviour • live fuel moisture • moisture content assessment • near surface fine fuels • surface fine fuels • total fuel load
<i>Weather analysis</i> may	• atmospheric stability

include:	• Bureau of Meteorology products and tools • calculation of fire danger ratings • cold fronts • diurnal cycles • droughts • Foehn winds • Katabatic and Anabatic winds • long-term weather cycles • relative humidity and dew point temperature • sea breezes and land breezes • seasonal cycles • short-term and local weather effects • temperature • temperature inversions • wind gustiness and directional variation • wind speed and direction
<i>Effects of topography on fire behaviour</i> must include:	• acceleration effects • dry upper winds – mixing/range effect • drought index and drought factor • fuel distribution • elevation • rockiness/continuity • land form (channelling) • slope and aspect
<i>Fire prediction tools and references</i> may include:	• CSIRO (Mcarthur) forest fire danger meter • CSIRO (Mcarthur) grassland fire danger meter • CSIRO (Mcarthur) grassland fire spread meter • Vesta fire model • WA forest fire behaviour tables • overall fuel hazard guide (DSE, 1999) • other fuel specific fire behaviour prediction systems (such as buttongrass in Tasmania, mallee-heath model, spinifex model)
<i>Map information and data</i> may include:	• maps of fire spread, estimated at time intervals as required by the incident management team, with separate mapping for probable and possible scenarios • narrative regarding limitations, assumptions, prediction uncertainties and other comment to assist in the interpretation of the data • victoria fire behaviour estimates
<i>Risks</i> may include:	• operational risk

	• public safety risk • risks to public and private assets • economic risk • environmental risk • legal risk • technical risk • political risk
Human, economic and environmental assets may include:	• areas of environmental or conservation value • areas of tourism value • crops and farm assets • historic sites • indigenous cultural sites • key infrastructure such as a major bridge or power transmission lines • plantations • private or public buildings • towns or settlements • water catchments
Strategy may include:	• offensive strategies: • direct attack • indirect attack • parallel attack • defensive strategies: • community and asset protection
Tactic may include:	• aerial suppression • back-burning/burning out • control line construction (hand, machine)

Unit Sector(s)

Not applicable.