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**Unit EF2:****Apply techniques and tactics to control vegetation fire.****Element 1.1:****Prepare for vegetation fire control activities****Element 1.2:****Control vegetation fires**

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**About this unit:**

This unit deals with the techniques and tactics used by individuals who are involved in managing vegetation fires in rural areas, either in fire suppression or prescribed burning operations.

It has been developed so that it can be applied to any area of vegetation: forest, shrub, grass or peat.

This unit is aimed at those who work in fire services, farming, forestry, game management, conservation, range land and recreation management who have a role managing vegetation fires, either on a full or part-time basis.

**To achieve it you must show that you are able to:**

- Interpret fire behaviour and apply appropriate techniques and tactics in a local area
- Follow organisational fire procedures
- Operate safely on the fireground
- Support others operating on the fireground
- React appropriately, within organisational procedures, to a fire incident.

**Key words and phrases:**

For you to fully understand the content of the unit, and the activities it describes, it is important that you are able to understand the terms used within the unit. The definitions at the back of this unit should help you with this.

|                     |   |
|---------------------|---|
| Bay(s)              | The areas in front of the headfire, between fingers of fire, where you may have fire on three sides   |
| Control line        | All constructed or natural barriers and treated fire edges used to control a fire.  |
| Crown fire          | A fire that advances through the tree crown fuel layer, usually in conjunction with a surface fire.   |
| Direct attack       | Fire control activity applied directly on the fire.   |
| Flank               | The sides of the fire   |
| Fingers             | Narrow slivers of advancing fire that extend beyond the head or flanks  |
| Fire behaviour      | The manner in which fire reacts to the variables of fuel, weather and topography described in terms of fire intensity and rate of spread.   |
| Fire hazard         | The potential exposure of people or assets to danger from the behaviour of the fire   |
| Fire Weather        | Predicted climatic conditions covering period of burn, especially wind, air temperature and relative humidity   |
| Fire Perimeter      | The outside edge of the fire  |
| Fire risk           | The potential for a fire to start   |
| Fuels               | The type, quantity, arrangement, distribution, & moisture content of the vegetation. Can be: ground (peat, roots), surface (plant litter, grass, shrubs) or aerial (trees) fuels. |
| Fire intensity      | The pulse or rate of energy release, that travels upwards from the fire, often linked to flame length   |
| Fire Support Office | Forest District Office, Estate Office, or company office where non-fire service support for fire control effort is organised  |
| Fire type           | Ground fire, surface fire or crown fire, most common type is surface fire.  |
| Flame length        | The distance from the base to the tip of the flames   |
| Flanking attack     | Most common direct attack strategy, that starts control activity from an anchor point, then progresses along flanks to head.  |
| Ground fire         | A fire that burns in the ground fuel layer often associated with smouldering fire.  |
| Head                | The front of the fire showing the greatest rate of spread   |
| Heel                | The rear of the fire near the origin  |
| Indirect attack     | Fire control activity away from the fire edge e.g. backburning  |
| LACES               | Lookouts, Awareness, Communications, Escape routes and Safety Zones   |
| Origin              | The place where the fire starts   |
| Rate of spread      | The speed the fire is expanding at the head of the fire   |
| Smouldering fire    | A fire burning without flame through solid material that spreads slowly, eg peat fire   |
| Spot fires          | New fires ignited ahead or away from the main fire by embers or a burning object  |
| Surface fire        | Fire that burns surface litter, other loose debris on the forest floor and small vegetation such as grass and low shrubs.   |
| Topography          | Shape of the land, especially slope and aspect  |
| Wildfire            | A fire that is not being controlled   |

**What you must be able to do:**

- 1 The location of the fire and the most effective route to the fire are obtained taking into account local conditions
- 2 Protective clothing and equipment, food and fluid requirements are identified and prepared before departure
- 3 Predict fire behaviour in your local area based on the combined influences of the fire environment
- 4 Assess the fire environment and provide a report with key vegetation fire information to your supervisor
- 5 Identify your role within your organisations fire procedures
- 6 Identify the role of your organisation, the fire group, fire service, and other agencies within fire procedures
- 7 Approach the fire in a safe manner
- 8 Return and secure resources on completion of activity, carry out immediate maintenance and report any defects or deficiencies

**This element covers:**

- A The types of fire:
  - (i) Ground
  - (ii) Surface
  - (iii) Crown
  
- B Key vegetation fire information:
  - (i) Location of fire (site, map reference)
  - (ii) Size of fire (small, medium, large)
  - (iii) Type of fuels burning (grass, crop, shrub, forest, peat/roots)
  - (iv) Type of fire (ground, surface, crown)
  - (v) Fire behaviour (rate of spread, flame length)
  - (vi) Access to fire
  - (vii) Water sources
  - (viii) People or property threatened by the fire

- C The key factors affecting fire behaviour:
- (i) Wind
  - (ii) Slopes
  - (iii) Fuels
  - (iv) Aspect

**What you must know and understand:**

- a. The information that can be gathered on fire behaviour from observation of the fire and the fire environment, including: flame lengths, smoke, wind, fuels, aspect and topography
- b. How to assess and analyse the information on observed fire behaviour logically
- c. The influence that types of fuel: peat/roots, grass, crops, shrub/scrub and forests have on fire behaviour
- d. The influence of different fuel features on fire behaviour including: type, size, arrangement/distribution, quantity and moisture content
- e. The influence of weather on fire behaviour including: wind speed and direction, air temperature, relative humidity, rain, and day/night variations.
- f. The influence of topography including: slopes, altitude, aspect, shape of the ground, gullies, and barriers to fire spread
- g. Your organisations fire plan and fire map, including symbols used and operating procedures
- h. The implications for your activities of the relevant legislation
- i. The role of the primary fire service and how to identify the incident commander

**Control vegetation fires**

**What you must be able to do:**

- 1 Extinguish fires using the tools made available, within the accepted range of fire behaviour for each tool, according to your organisations procedures
- 2 Progress your objectives using dynamic risk assessment to minimise risks to yourself, team members and the public
- 3 Observe and report the development of the fire and changes in fire behaviour, weather, fuels or topography to your supervisor
- 4 Be aware of the location of the fire, fire behaviour and your team members at all times

- 5 Be aware of your route to a safe area(s) at all times
- 6 Maintain communication with team members and your supervisor through the whole operation.
- 7 Contribute to de-briefs after the activity has ended.

**This element covers:**

A The stages in controlling a vegetation fire:

- (i) Knockdown
- (ii) Containment
- (iii) Mop up and patrol

B Fire control strategies:

- (i) Offensive and defensive
- (ii) Direct and flanking attack
- (iii) Parallel and Indirect attack
- (iv) Combination attack

C The methods of extinguishment:

- (i) Remove oxygen
- (ii) Remove heat
- (iii) Remove fuel

D Control line construction:

- (i) Anchor points
- (ii) Line types

**What you must know and understand:**

- a. The priority of personnel safety and the values and assets that you are trying to protect.
- b. The role of lookouts, the importance of being aware of the fire situation and being able to communicate with team members and your supervisor at all times. Knowing where your escape routes are, as well as when to use them and how long it will take to reach your designated safety zones (LACES)

- c. The fire triangle and the methods of extinguishment using a variety of vegetation fire tools
- d. The ranges of flame lengths that different tools, tactics and strategies can cope with.
- e. The efficiency and safety of different fire control tools and techniques applied in a variety of situations
- f. How to work safely in the vicinity of: vehicles, tractors, bulldozers, helicopters and aircraft.
- g. The basic principles and methods of control line construction and placement in varied terrain
- h. How to work as part of a team with a variety of tools, techniques and strategies in combined attack

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