FPIFGM4009A Interpret and use aerial photographs for forest management

Unit Descriptor
This unit describes the outcomes required to use aerial photography as a tool to assist with forest management in both plantation and native forests.

Pre-requisite Unit(s)
FPICOR4001A Monitor SH&E policies and procedures

Application of the Unit
Competency Field Forest and Forest Products
Sector Forest Growing and Management

ELEMENT PERFORMANCE CRITERIA
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 Required Skills and Knowledge and/or the Range Statement. Assessment of performance is to be consistent with the Evidence Guide.

1 Select aerial photographs

1.1 Applicable OH&S, legislative and organisational requirements relevant to interpreting and using aerial photographs for forest management are verified and complied with

1.2 Forest management objectives are established in accordance with organisational requirements

1.3 Available aerial photographs are located and obtained in accordance with standards and requirements and organisational guidelines

1.4 Factors and type of photography appropriate for current forest management application is determined

1.5 Aerial photographs are assessed for suitability and selected to meet forest management application

2 Interpret forest management information from aerial photographs

2.1 Aerial photographs are positioned for viewing and scale is calculated and documented in accordance with site procedures

2.2 Key aspects of aerial photographs are established and documented in accordance with site procedures

2.3 Type of photography suitable for forest management application is confirmed using established stratification in accordance with site procedures

2.4 Photomapping standards are interpreted and applied for consistent data-gathering
2.5 *Forest attributes* are identified and required *forest management information* is derived and interpreted in accordance with interpretation convention and *guidelines*.

2.6 Aerial photographs are interpreted and mapped in accordance with organisational guidelines.

2.7 Field observations, *verification* and validation are recorded and reported in appropriate formats in accordance with organisational guidelines.

3 Update maps/plans from aerial photographs

3.1 *Maps and plans* are assessed and updated as required to meet forest management project requirements.

3.2 Appropriate *tools* are used to *transfer data* in accordance with manufacturer recommendations.

3.3 Maps and plans are updated using appropriate symbols, colours and conventions.

3.4 Documentation is completed, processed and maintained in accordance with organisational requirements.

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required skills include:**

- Comply with legislation, regulations, standards, codes of practice and established safe practices and procedures for interpreting and using aerial photographs for forest management.

- Use and maintain relevant tools and equipment.

- Identify problems and equipment faults and demonstrate appropriate response procedures.

- Use appropriate communication and interpersonal techniques with colleagues and others.

- Accurately record and maintain information including details of forest attributes and topographical information.

- Efficiently and effectively carry out interpretation procedures.

- Apply appropriate mathematical techniques to calculate scale of an aerial photograph, scale distances for a map, calculate and manipulate height and area information.

- Read and interpret complex information including charts, tables, maps and flight plan.

- Identify map type and map features and recognise.
topographic map features

- Interpret forest area detail from a map
- Identify and interpret title panel information on an aerial photograph
- Identify disease symptoms in trees/forest areas on an aerial photograph
- Identify vegetation characteristics on an aerial photograph
- Locate required photographs from appropriate records (flight plan map)

**Required knowledge and understanding include:**

- State/Territory OH&S legislation, regulations, standards and codes of practice relevant to the full range of processes for interpreting aerial photographs
- Applicable organisational and site standards, requirements, policies and procedures
- Environmental requirements, processes and forest dynamics
- Established communication channels and protocols
- Problem identification and resolution
- Common scales used on maps and plans
- Local forest types and structures
- Representation of topographic features on maps and plans
- Range of photographic film, photo types
- Care and storage of aerial photographs
- Use and manipulation of scales
- Uses of aerial photography for forest management
### Key Competencies

The seven key competencies represent generic skills considered necessary for effective participation by an individual in the workplace.

- **Performance Level 1** – at this level, the candidate is required to undertake tasks effectively.
- **Performance Level 2** – at this level, the candidate is required to manage tasks.
- **Performance Level 3** – at this level, the candidate is required to use concepts for evaluating and reshaping tasks.

<table>
<thead>
<tr>
<th>Key Competency</th>
<th>Example of Application</th>
<th>Performance Level</th>
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<tbody>
<tr>
<td>How are ideas and information communicated within this competency?</td>
<td>Ideas and information, verbal and written, are communicated in simple English to confirm work requirements, convey information to colleagues, and report outcomes relating to interpretation of aerial photographs.</td>
<td>1</td>
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<tr>
<td>How can information be collected, analysed and organised?</td>
<td>Collect, organise, interpret and understand information required to determine forest management requirements from an accurate interpretation of aerial photographs.</td>
<td>2</td>
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<tr>
<td>How are activities planned and organised?</td>
<td>Organise and conduct aerial photograph interpretation activities in the correct sequence to complete within the designated timeframes.</td>
<td>2</td>
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<tr>
<td>How is team work used within this competency?</td>
<td>Effective communication and interpersonal techniques are used with colleagues and others to maximise confidence, satisfaction and productivity during the interpretation of aerial photographs processes.</td>
<td>1</td>
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<tr>
<td>How are mathematical ideas and techniques used?</td>
<td>Mathematical ideas and techniques are used to calculate aerial photograph scale, calculate height and area information and scale distances from a map.</td>
<td>2</td>
</tr>
<tr>
<td>How are problem solving skills applied?</td>
<td>Establish efficient and effective interpretation processes which anticipate likely problems to avoid wastage and downtime.</td>
<td>1</td>
</tr>
<tr>
<td>How is use of technology applied?</td>
<td>Use appropriate tools for the transfer of data and format and maintain data and</td>
<td>2</td>
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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. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

| OH&S requirements | are to be in accordance with Commonwealth, State or Territory legislation and regulations, organisational safety policies and procedures. Requirements may include but not be limited to the use of personal protective equipment and clothing, fire fighting equipment, first aid equipment, hazard and risk control and elimination of hazardous materials and substances, use of chemicals including off-site effects, dangers to the public, manual handling including lifting and carrying, and required actions relating to forest fire |
| Legislative requirements | are to be in accordance with applicable legislation from all levels of government that affect organisational operation. Requirements may include but not be limited to award and enterprise agreements, industrial relations, Australian Standards, confidentiality and privacy, OH&S, the environment, equal opportunity, anti-discrimination, relevant industry codes of practice, duty of care, and heritage and traditional land owners issues |
| Organisational requirements | may include but not be limited to legal, organisational and site guidelines, policies and procedures relating to own role and responsibility, quality assurance, procedural manuals, quality and continuous improvement processes and standards, OH&S, emergency and evacuation, ethical standards, recording and reporting, access and equity principles and practices, equipment use, maintenance and storage, environmental management (waste disposal, recycling and re-use guidelines) |
| Available aerial photographs | may be held by the organisation, required to be purchased, or borrowed from another organisation |
| Standards and requirements | include scale, flying height and focal length, required percent endlap and sidelap, orientation, location and number of flight lines required, total number of photographs required, allowable drift, crab, tilt and image motion, camera characteristics |
format, lens quality, shutter speed and aperture, film and filter characteristics, acceptable seasons of the year, time of day, allowable present cloud cover, and hot spots

Factors

- to be considered when selecting photography for a project are colour or black and white, date of acquisition, scale, minimum mappable area, actual smallest operational unit area, scale of mapping relative to scale of presentation

Types

- may include project, mapsheet, spot and stratigraphic
- of photographic classes include terrestrial, vertical and oblique
- of aerial photographic film include black and white, black and white infra-red, colour, colour infra-red

Applications

- of aerial photographs to natural resource management include road/plantation design, field navigation and the interpretation of forest types, forest structure, environmental processes such as salinity discharge ecological vegetation communities such as coastal heathlands, land capability classes, remnant vegetation (roadside vegetation), diseased vegetation classes such as *Eucalyptus* dieback from *Phytophthora*

Positioning

- may involve orientating and aligning a pair of overlapping aerial photographs for stereoscopic viewing

Key aspects

- include determining North and flight line path, and may include mapsheet, flight orientation, photography type, focal length, film number, run number, frame number, height above sea level, and photography date

Maps and plans

- may include cadastral plans, topographic maps, locality plans, site plans, maps and plans generated through the use of Geographic Information Systems

Updating

- of maps and plans may be manual or electronic (digital) using data transfer technology

Tools

- may include electronic data transfer technology, manual light table, mechanical light tables including Omnigraph, Kartoflex, Zoom Transfer Scope, Artiscope and Sketchmaster

Transfer data

- is to rescale from one source to another and the transfer medium may be map to map, photograph to...
map or diapositive to map

Forest attributes
- may include topographic features such as roads and tracks, watercourses, ridges and spurs, saddles, and peaks and knobs

Forest management information
- derived from photo may include area, height, species, crown cover, crown form, disturbance

Interpretation
- basic principles include absolute and relative size, shape, shadow, tone or colour, texture, pattern, and location, association and convergence of evidence

Guidelines
- for photographic interpretation may include predetermined classes and stratification

Field verification
- includes accuracy of all mapped topographic information, measure of accuracy of associated base topographic or digital base map, spatial accuracy of strata, and measure of accuracy of content of strata

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.

Overview of assessment
- A person who demonstrates competency in this standard must be able to provide evidence that they can derive and interpret information from an aerial photograph for forest management purposes within organisational guidelines

Critical aspects for assessment and evidence required to demonstrate competency in this unit
- Compliance with OH&S, environmental, and organisational/site policies and procedures, and State/Territory legislation applicable to interpreting and using aerial photographs for forest management
- Communicate effectively and work safely with others in the work area
- Source and obtain suitable aerial photographs appropriate to forest management project requirements
- Efficiently and effectively establish key aspects of aerial photographs, derive and interpret information from forest topographical features, and document and maintain data and information
- Interpret forest area detail from a map and scale distances and calculate height and area information

Context of, and specific resources
- The application of competency is to be assessed in the
for assessment workplace or realistically simulated workplace

- Assessment is to occur under standard and authorised work practices, safety requirements and environmental constraints

- Assessment of essential underpinning knowledge, other than confirmatory questions, will usually be conducted in an off-site context

- Assessment is to comply with relevant regulatory or Australian Standards requirements

- The following resources should be made available:
  - workplace location or simulated workplace
  - materials and equipment relevant to interpret and use aerial photographs for forest management
  - specifications and work instructions