Australian Government

FPIFGM5219 Undertake carbon stock sampling of forests and plantations

Release 1

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

FPIFGM5219 Undertake carbon stock sampling of forests and plantations

Modification History

Version	Code and title of equivalent unit of competency
1.0	FPIFGM5218A Undertake carbon storage sampling of forests and plantations. Equivalent

Unit Descriptor

Unit descriptor This unit describes the outcomes required to assess forests and plantations for current and future carbon stocks, including the use of growth modelling techniques to estimate future stocks.

Application of the Unit

Application of the unit The unit involves assessing forests and plantations for current and future carbon stocks in a variety of work settings, including:

- native forest environment
- hardwood or softwood plantation
- agroforestry and farm forestry.

The skills and knowledge required for competent workplace performance are to be used within the scope of the person's job and authority.

Licensing/Regulatory Information

General workplace legislative and regulatory requirements apply to this unit. Subject to enterprise requirements specific licences/certification may be required in the following areas:

- Forest sustainability certification
- Chain of custody certification.

Pre-Requisites

Not applicable.

Employability Skills Information

Employability skills 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 performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan for carbon stock sampling activities	1.1. Applicable ***work/occupational health and safety*** (WHS/***OHS***), ***environmental***, ***legislative*** and ***organisational requirements*** relevant to planning and managing a carbon stock sampling activity are identified and followed 1.2. Purpose, objectives and scope of sample collection activity are confirmed from discussions with stakeholders 1.3. Desktop study of existing forests and plantations is conducted 1.4. ***Measurement program*** is designed 1.5. Sampling site locations are confirmed and where required, ***approval*** is obtained for site access 1.6. ***Characteristics of sites*** are evaluated for impact on sampling and testing method 1.7. Human and physical ***resource requirements*** are determined and arranged
2. Prepare for carbon stock sampling activities	2.1. Surveying activity and contractors are arranged 2.2. Forests and plantations are located using site maps and plans 2.3. Areas of forests and plantations for sampling are identified 2.4. WHS/OHS hazards are identified, risks assessed, and the controls implemented are reported 2.5. Administrative requirements are completed and approvals obtained
3. Conduct carbon stock sampling collection	3.1. Safe working environment is established and monitored throughout sampling activities 3.2. Sampling activities are coordinated at sites prior to commencement of and during the work activity 3.3. Sampling equipment is inspected and tested to ensure functionality, safety and compliance with manufacturer instructions 3.4. Surveys and sampling are conducted in line with site, enterprise and legislative requirements 3.5. Hazards and emergency situations are recognised and responded to in line with site and legislative requirements 3.6. Results of samples and surveys are ***recorded*** in line with sampling plan

ELEMENT	PERFORMANCE CRITERIA
	3.7. ***Sampling*** activities are monitored on a regular basis against sampling plan and required modifications or improvements are implemented
4. Interpret results	4.1. Forest carbon stocks are estimated from data collected
	4.2. ***Assessment*** is reviewed against assessment program and organisational requirements
	4.3. ***Information*** and data are analysed to determine effectiveness of assessment and improvements to future programs
	4.4. Recommendations for future programs are prepared based on findings of analysis, and consultation is conducted
	4.5. Assessment processes are recorded and reported to appropriate personnel
5. Use growth models to predict biomass and carbon stocks	5.1. Appropriate growth model is selected
	5.2. Information and data from assessments are used in growth models to predict biomass growth and carbon stocks
	5.3. Data is analysed to determine if predicted forest carbon stocks are comparable to available data

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- Technical skills to select sampling techniques and create sampling designs; identify species growing in the target area; and identify components of the forest/plantation that contain carbon stocks
- Communication skills to use appropriate consultative, communication and interpersonal techniques with colleagues and others; and present written and oral information to a wide range of individuals and groups
- Literacy skills to analyse qualitative and quantitative information and data; prepare site maps and plans; and accurately prepare a range of reports, documentation and submissions where precise meaning is required
- Numeracy skills to use growth models to predict growth; and use and adapt complex maps and diagrams
- Problem-solving skills to demonstrate time and project management

Required knowledge

- Applicable commonwealth, state or territory legislation, regulations, standards, codes of practice and established safe practices relevant to the full range of processes for undertaking carbon stock sampling of forests and plantations
- Environmental protection requirements, including the safe disposal of waste material and minimising environmental impact
- Organisational, site and management standards, requirements, policies and processes for undertaking carbon stock sampling of forests and plantations
- Environmental risks and hazards associated with undertaking carbon stock sampling of forests and plantations
- Using energy effectively and efficiently
- Using materials effectively and efficiently
- Procedures for the development and implementation of a range of environmental management strategies
- Data collection and analysis methods
- Map and plan preparation techniques
- Characteristics and growth habits of local vegetation
- Soil characteristics and topography of local area
- Use and application of appropriate survey and assessment equipment
- Statistical analysis techniques applicable to biomass and carbon assessments
- Sampling techniques applicable to biomass and carbon assessments
- Use and application of growth models
- Established communication channels and protocols
- Problem identification and resolution strategies
- Types of tools and equipment, and procedures for their safe use and maintenance

REQUIRED SKILLS AND KNOWLEDGE

- Appropriate mathematical procedures for estimation and measurement
- Procedures for the recording, reporting and maintenance of workplace records and information

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

A person who demonstrates competency in this unit must be able to provide evidence and demonstrate that they can plan and oversee an assessment of forests and plantations for carbon stocks, and interpret the results for use in growth models to predict carbon stocks.

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

The evidence required to demonstrate competency in this unit must be relevant to, and satisfy, all of the requirements of the elements of this unit and include demonstration of:

- following applicable commonwealth, state or territory legislative and regulatory requirements and codes of practice relevant to planning, implementing, monitoring and reviewing an assessment of forests and plantations for carbon stocks, and using growth models to predict carbon stock growth
- following organisational policies and procedures relevant to planning, implementing, monitoring and reviewing an assessment of forests and plantations for carbon stocks, and using growth models to predict carbon stock growth
- planning an assessment program using consultative processes with colleagues and stakeholders to obtain inputs, and ensuring efficient and safe processes and timelines
- safely implementing an assessment program in line with documented plan and budget, and making adjustments to program as required
- monitoring the conduct of the sampling collection
- interpreting the results of the sampling program and preparing and providing an estimate of carbon stocks
- using data from assessments to predict biomass growth and carbon stocks
- checking predicted data against new assessment data to modify growth models to better represent the forests or plantations being assessed.

Context of and specific resources

- Competency is to be assessed in the workplace or

EVIDENCE GUIDE

for assessment

realistically simulated workplace

- Assessment is to occur under standard and authorised work practices, safety requirements and environmental constraints
- Assessment of required knowledge, other than confirmatory questions, will usually be conducted in an off-site context
- Assessment is to follow relevant regulatory or Australian Standards requirements
- The following resources should be made available:
  - workplace location or simulated workplace
  - materials and equipment relevant to undertaking work applicable to this unit
  - specifications and work instructions

Method of assessment

- Assessment must satisfy the endorsed Assessment Guidelines of the FPI11 Training Package
- Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of required knowledge
- Assessment must be by direct observation of tasks, with questioning on required knowledge and it must also reinforce the integration of employability skills
- Assessment methods must confirm the ability to access and correctly interpret and apply the required knowledge
- Assessment may be applied under project-related conditions (real or simulated) and require evidence of process
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances
- Assessment may be in conjunction with assessment of other units of competency
- The assessment environment should not disadvantage the candidate
- Assessment practices should take into account any relevant language or cultural issues related to Aboriginality, gender or language backgrounds other than English
- Where the participant has a disability, reasonable

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adjustment may be applied during assessment

- Language and literacy demands of the assessment task should not be higher than those of the work role

Range Statement

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, if used in the performance criteria, is detailed below. 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) may also be included.

WHS/OHS requirements:

- are to be in line with applicable commonwealth, state or territory legislation and regulations, and organisational safety policies and procedures, and may include:
  - personal protective equipment and clothing
  - safety equipment
  - first aid equipment
  - fire fighting equipment
  - hazard and risk control
  - fatigue management
  - elimination of hazardous materials and substances
  - safe forest practices, including required actions relating to forest fire
  - manual handling, including shifting, lifting and carrying

Environmental requirements:

- may relate to:
  - hygiene of the area
  - commonwealth, state or territory and local legislation and regulations
- may include consideration of:
  - ground growth
  - canopy
  - general forest health
  - wind speed and direction
  - fallen trees
  - density of trees
  - ground slope
  - soil and water protection
  - ground hazards and obstacles
  - contingencies for modifying operations during wet or other adverse weather

RANGE STATEMENT

conditions

Legislative requirements:

- are to be in line with applicable commonwealth, state or territory legislation, regulations, certification requirements and codes of practice and may include:
  - Australian standards
  - WHS/OHS procedures
  - the environment
  - relevant industry codes of practice
  - duty of care

Organisational requirements may include:

- organisational and site guidelines
- policies and procedures relating to own role and responsibility
- procedural manuals
- quality and continuous improvement processes and standards
- WHS/OHS, emergency and evacuation procedures
- ethical standards
- recording and reporting requirements
- equipment use, maintenance and storage requirements
- environmental management requirements (waste minimisation and disposal, recycling and re-use guidelines)

Measurement program:

- is used to calculate current and expected biomass and carbon stocks of:
  - trees (above and below ground)
  - other vegetation
  - litter layer
  - soil
  - wood products
- may include:
  - putting a monitoring process in place to enable reporting against marketing, strategic and business plans
  - incorporating the use of growth models to predict biomass growth and carbon stock growth

Approvals:

- may be required by:
  - environmental bodies

RANGE STATEMENT

	• local, state, territory and commonwealth government bodies and agencies • may include • long-term budget approvals • authorisations, such as: • permits • licences relating to neighbouring sites or properties, hours of operation, use and application of chemicals, the environment
Characteristics of sites may include:	• range of operations • conditions • hazards • difficult/sensitive environments
Resource requirements may include:	• people • materials and equipment • tools, including geographic information systems and aerial photography
Records:	• may include: • difficulties or issues faced during planning and implementation of the assessment program • recommendations for future work • results, costs, data analysis • may be: • manual • using a computer-based system or other appropriate communication system
Sampling techniques:	• relate to measurement and survey • may include: • use of geographic information systems • interpretation of aerial photography
Assessment may include checking:	• compliance with WHS/OHS, organisational. legislative and environmental regulations, procedures, practices and precautions • adherence to site environmental imperatives • specifications, quality, performance targets • documentation is completed and submitted as required

RANGE STATEMENT

Information:

- relates to the sample area
- may include:
  - previous surveys and assessments
  - aerial photography
  - geographic information systems data
  - previous reports
  - management information systems data
  - marketing, strategic data
  - business plans and associated implementation plans

Unit Sector(s)

Not applicable.

Competency field

Forest Growing and Management