Modification history

Release	Comments
Release 2	This version released with AHC Agriculture, Horticulture, Conservation and Land Management Training Package Version 4.0.
Release 1	This version released with AHC Agriculture, Horticulture, Conservation and Land Management Training Package Version 1.0.

AHCARB604	Measure and improve the performance of urban forests
Application	This unit of competency describes the skills and knowledge required to research, analyse the values, analyse the performance, and develop management recommendations to improve the performance of an urban forest. The unit applies to individuals with broad theoretical and technical knowledge of a specific area, or a broad field, of work and learning. They have a broad range of cognitive, technical and communication skills and demonstrate autonomy and judgement for defined area of responsibility, undertaking complex work with broad parameters to provide specialist advice and functions. No occupational licensing, legislative or certification requirements are known to apply to this unit at the time of publication.
Prerequisite Unit	Nil
Unit Sector	Arboriculture (ARB)

Elements	Performance Criteria
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
1. Research urban forest practices and applications	1.1 Research urban forest case studies and management reports 1.2 Review best management practices in urban forest planning and management 1.3 Research applications and functional tools measuring benefits of urban forests
2. Analyse and report on urban forest benefits	2.1 Analyse economic, social and environmental benefits of urban forests 2.2 Document evidence-based research into a preliminary report on benefits of urban forests
3. Determine values of urban forest benefits	3.1 Conduct sampling analysis of specified urban forest 3.2 Determine required sample size to assess total tree population 3.3 Determine accuracy of sample size 3.4 Determine the quantitative values of urban forest environmental benefits 3.5 Identify base financial value for functional benefit 3.6 Calculate financial values of functional and environmental benefits of current tree population 3.7 Determine benefits of heat island modification of urban areas 3.8 Document a preliminary report on total asset valuation of an urban forest
4. Analyse and compile results	4.1 Analyse urban forest structure and function 4.2 Estimate life expectancy of tree population 4.3 Compile results of urban forest analysis

Elements	Performance Criteria
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
5. Document a report on improvement of urban forests	5.1 Identify urban forest issues within tree population sample area 5.2 Determine recommendations for tree species and diversity 5.3 Determine extent of current tree planting and replacement programs 5.4 Determine volume and rate of planting programs required for improvements to urban forest performance 5.5 Determine required modifications to planting practices 5.6 Determine targets for urban forest improvement 5.7 Document urban forest performance and provide recommendations for improvement in a report

Foundation Skills (NB - To be completed following confirmation of PC's)	
This section describes those language, literacy, numeracy and employment skills that are essential for performance in this unit of competency but are not explicit in the performance criteria.	
Skill	**Description**
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Unit Mapping Information			
Code and title current version	**Code and title previous version**	**Comments**	**Equivalence status**
AHCARB604 Measure and improve the performance of urban forests	AHCARB604 Measure and improve the performance of urban forests	Changes to Performance Criteria for clarity Updated Performance Evidence and Knowledge Evidence	Equivalent unit

Links	Companion Volumes, including Implementation Guides, are available at VETNet: https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=c6399549-9c62-4a5e-bf1a-524b2322cf72

TITLE	Assessment requirements for AHCARB604 Measure and improve the performance of urban forests

Performance Evidence

An individual demonstrating competency must satisfy all of the elements and performance criteria in this unit.

There must be evidence that the individual has measured and improved the performance of an urban forest and has:
- researched urban forest case studies and management reports
- reviewed best management practices in urban forest planning and management
- researched applications and functional tools measuring benefits of urban forests
- analysed and documented a preliminary report of social and environmental benefits of urban forests
- conduced sampling analysis of a specified urban forest
- determined sample size required to accurately assess total tree population
- determined the quantitative values of urban forest, energy savings, environmental and amenity benefits for the following:
    - canopy cover
    - total carbon storage and annual carbon dioxide sequestration
    - rainfall interception
    - air pollution removal
- identified base financial value for each functional benefit
- calculated financial values of functional and environmental benefits of tree population
- determined benefits of urban heat island modification
- documenting a preliminary report on total asset valuation of urban forest
- analysed urban forest structure and function covering the following in the analysis:
    - urban tree population half-life
    - vacant planting ratio
    - species distribution
    - population diversity
- estimated life expectancy of tree population
- compiled results of urban forest analysis
- identified urban forest issues within tree population sample area
- determined recommendations for tree species and diversity
- determined extent of current tree planting and replacement programs
- determined volume and rate of planting programs required for improvements to urban forest performance
- determined required modifications to planting practices
- determined targets for urban forest improvement
- documented a report on urban forest performance and provided recommendations for improvement.

Knowledge Evidence

An individual must be able to demonstrate the knowledge required to perform the tasks outlined in the elements and performance criteria of this unit. This includes knowledge of:
- urban forests and their management including:
    - reports and case studies
    - best management practices in urban forest planning and management
- measuring the performance of urban forests and their management
- applications and functional tools for measuring benefits of urban forests
- analysing the benefits of urban forests including:
    - economic and political
    - physical and psychological on community
    - environmental and ecological
- evidence-based research what it is and how to conduct including:
    - sampling and analysis of sampling
- urban forests and their social, environmental and economic implications including:
    - calculating canopy cover and estimating carbon storage and annual carbon dioxide sequestration

Knowledge Evidence

- rainfall interception
- air pollution removal
- energy savings benefit
- environmental benefits
- amenity benefits
- valuing urban forests from an economic base including:
    - financial value for functional benefits
    - calculations of financial values of functional and environmental benefits
    - concepts of urban heat island and its modification with urban forests
    - determining the total asset valuation
- urban forests their structure, function and faults including:
    - urban tree population life expectancy
    - vacant planting ratio
    - species distribution and population diversity
    - urban forest analysis techniques
    - identifying urban forest issues within tree populations
- defining problems and compiling recommendations for tree species and diversity including:
    - tree planting and replacement programs
    - volume and rate of planting programs
    - modifications to planting practices
    - targets for urban forest improvement
- report writing and structure of urban forest documents and reports.

Assessment Conditions

Assessment of skills must take place under the following conditions:
- physical conditions:
    - access to an urban forest or environment that accurately represents workplace conditions
- resources, equipment and materials:
    - computer with word processing software and statistical analysis software
    - internet connection
    - measurement and data collection tools
- specifications:
    - access to urban forest performance reports, research materials and case studies.

Assessors must satisfy current standards for RTOs in the assessment of arboriculture units of competency.

Assessment must be conducted only by persons who have:
- arboriculture vocational competencies at least to the level being assessed
- current arboriculture industry skills directly relevant to the unit of competency being assessed.

Links	Companion Volumes, including Implementation Guides, are available at VETNet: https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=c6399549-9c62-4a5e-bf1a-524b2322cf72