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.

AHCARB8XX	Research urban forest performance
Application	This unit of competency describes the skills and knowledge required to research an urban forest for its processes, benefits, values and impact on climate change and produce a report on its performance. The unit applies to individuals with advanced theoretical and technical knowledge and skills for professional or highly skilled work and/or further learning in one or more disciplines or areas of practice. This unit applies to individuals with advanced cognitive, technical and communication skills to provide specialist advice, analysis and generate and transmit solutions to complex problems. They demonstrate autonomy, well-developed judgement, adaptability and responsibility as a practitioner or learner. 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 processes	1.1 Investigate and define elemental components of urban forests 1.2 Investigate role of urban forests as a primary component of urban ecosystems 1.3 Investigate threats to and resilience of urban forests in cities 1.4 Investigate effects of trees on hydrology and water quality 1.5 Investigate relationship of trees on soil environment 1.6 Determine contribution of trees towards rhizosphere biodiversity, bioremediation and soil health
2. Evaluate benefits of urban forests	2.1 Investigate energy conservation and micro-climate modification systems of trees and urban forests 2.2 Research heat island analyses of an urban area 2.3 Evaluate health, social and psychological benefits of urban forests 2.4 Compile investigations and research into a preliminary report on benefits of urban forests
3. Analyse methods for urban forest valuation and prepare a report	3.1 Investigate current methods and technologies for spatial mapping of urban forests 3.2 Analyse process of carbon sequestration in urban forests 3.3 Analyse methods for sampling urban forests 3.4 Evaluate urban forest valuation methodologies 3.5 Compile investigations and analysis into a preliminary report on methods for valuing an urban forest
4. Examine climate change mitigation of urban forests	4.1 Investigate contribution of urban forest to carbon cycles 4.2 Determine local climate, soil and management factors affecting forest growth and carbon sequestration 4.3 Investigate forest carbon sequestration to help mitigate climate change 4.4 Document an evaluation of forest mitigation on climate change

Elements	Performance Criteria
Elements describe the essential outcomes.	*Performance criteria describe the performance needed to demonstrate achievement of the element.*
5. Compile information and document a report on urban forest performance	5.1 Document a report on the social, environmental, economic and climatic values of urban forests 5.2 Determine challenges of increased urbanisation and urban densification on urban forests 5.3 Determine potential benefit of urban forest to mitigate climate change 5.4 Compile and review preliminary reports and investigations 5.5 Prepare and present a report on urban forest performance

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
AHCARB8XX Research urban forest performance	AHCARB703 Research urban forest performance	Code change to reflect revised level from AQF 7 to AQF 8 Changes to Elements and 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 AHCARB8XX Research urban forest performance**

Performance Evidence

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

There must be evidence that on at least one occasion the individual has researched the performance of an urban forests and has:
- investigated urban forest processes including:
  - elemental components of urban forests
  - role of urban forests as a component of urban ecosystems
  - threats and resilience of urban forests
  - impact of urban forests on hydrology and water quality
  - relationship of trees on soil biota and chemistry
- determined contribution of trees towards rhizosphere biodiversity, bioremediation and soil health
- investigated energy conservation and micro-climate modification systems of trees and urban forests
- researched and analysed heat island effect of an urban area
- evaluated health, social and psychological benefits of urban forests
- documented a preliminary report on benefits of urban forests
- researched methods and technologies for spatial mapping of urban forests
- analysed carbon sequestration process in urban forests
- analysed methods for sampling urban forests
- evaluated urban forest valuation methodologies
- documented a preliminary report on valuation of an urban forest
- investigated contribution of urban forest to carbon cycles
- determined local climate, soil and management factors affecting forest growth and carbon sequestration
- investigated forest carbon sequestration to help mitigate climate change
- documented an evaluation of forest mitigation on climate change
- documented a report on social, environmental, economic and climatic values of urban forests
- determined challenges of increased urbanisation and urban densification on urban forests
- determined potential benefit of urban forest to help mitigate climate change
- compiled preliminary reports and investigations
- prepared a report on urban forest performance which must include:
  - multi-disciplinary solutions to challenges of urbanisation on urban forests.

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:
- principles and impact of urban forest on our ecological and social environment including:
  - elemental components of urban forests
  - role of urban forests as a primary component of urban ecosystems
  - urban forests in cities their threats and resilience
- trees and their impact on hydrology and water quality including:
  - regulation of hydrological processes
  - retention of precipitation
  - mitigation of salinity
- trees and their impact on soils including:
  - relationship of soil biological network
  - soil chemistry and structure
  - soil stabilisation and erosion control
- interactions of trees in their growing environment and urban setting including:
  - contribution of trees towards rhizosphere biodiversity, bioremediation and soil health
  - energy conservation and micro-climate modification systems of trees and urban forests
  - heat island analyses of an urban area
  - health, social and psychological benefits of urban forests

Knowledge Evidence

- capturing, recording and assessing urban forest data and values including:
  - methods and technologies of spatial mapping of urban forests
  - the carbon cycle, urban forests and carbon economics
  - methods for sampling urban forests
  - urban forest valuation methods
  - contribution of urban forest to carbon cycles and mitigation of climate change
  - influences of climate, soil and management strategies affecting forest growth and carbon sequestration
  - evaluation of urban forest and benefits to climate change
- social, environmental, economic and climatic values of urban forests including:
  - urbanisation and urban densification on urban forests development
  - solutions to challenges of urbanisation on urban forests.

Assessment Conditions

Assessment of skills must take place under the following conditions:
- physical conditions:
  - access to an urban forest and urban environment or environment that accurately represents this condition
- resources, equipment and materials:
  - computer with word processing, and statistical software
  - internet connection and search tools
  - measurement and data collection tools
- specifications:
  - access to standard procedures and quality standards for performing tests and conducting assessments
  - access to sample reports for urban forests
  - access to urban forest valuation methods and techniques.

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