Title	Fine-Scale Vegetation Mapping of the Coffs Harbour Local Government Area, 2012. VIS_ID 4189
Alternative title(s)	CoffsHarbourLGA_2012_E_4189
Abstract	This dataset represents fine-scale floristic vegetation mapping within the Coffs Harbour Local Government Area. Vegetation has been categorized into communities, classes and formations, with the composition of respective vegetation species identified. Mapping was conducted by vegetation mapping 'experts' (NSW Department of Environment and Heritage) between September 2009 and April 2012, and was based on 3-D PLANAR modelling, aerial photography interpretation, field floristic assessment, and PATN statistical analysis. A nominal scale of use of 1:5,000 is recommended for dataset display and interpretation, as linework digitising was based on ADS40 (50cm resolution) and minimum polygon size of 0.2 ha, and was captured at screen scale of between 1:1000 and 1:1500. The map is not to be used at a property level scale or for development applications where a scale of 1:1200 or greater may be required to determine the level variation of vegetation within a property. Furthermore, DAs still need to undergo the rigour of planning laws in NSW including local assessment of impacts on flora and fauna. Overall thematic accuracy is reported at 66% (independent assessment), with OEH reviewed overall accuracy being 77% weighted by total area of each vegetation class. The dataset is to be considered a standalone layer. VIS_ID 4189

Resource locator

Data Quality Statement	Name: Data Quality Statement Protocol: WWW:DOWNLOAD-1.0-http--download Description: DQS for Coffs Harbour vegetation map Function: download
Download Package	Name: Download Package Protocol: WWW:DOWNLOAD-1.0-http--download Description: Data and Documents Function: download
WMS	Name: WMS Protocol: WWW:DOWNLOAD-1.0-http--download Description: Web Map Service Function: download
REST Service	Name: REST Service Protocol: WWW:DOWNLOAD-1.0-http--download Description: ESRI REST Services directory Function: download

Unique resource identifier

Code	ff74b1ed-641c-464f-8d4f-d4f33ac6d58d

Presentation form	Map digital
Edition	1
Dataset language	English
Metadata standard	
Name	ISO 19115
Edition	2016
Dataset URI	https://datasets.seed.nsw.gov.au/dataset/ff74b1ed-641c-464f-8d4f-d4f33ac6d58d
Purpose	The dataset was primarily designed to identify vegetation communities, classes and formations, for display and interpretation at scales less than, or equal to, 1:5,000. Non-natural areas, devoid of vegetation, have not been mapped. Various levels of attribute confidence are identified within the data's 'Confidence' attribute field. Users are reminded that the layer represents a model, and should only be regarded as an interpretation or prediction of real-world phenomena.
Status	Completed
Spatial representation	
Type	vector
Spatial reference system	
Code identifying the spatial reference system	4283
Equivalent scale	1:None
Additional information source	Replaces CoffsHarbourLGA12_v1_1_E_3866. Includes draft PCT & EEC classifications.NSW Office of Environment and Heritage (2012). Development of a Fine-Scale Vegetation Map for the Coffs Harbour Local Government Area. Volume 1: Project Report. Office of Environment and Heritage, Coffs Harbour NSW Australia.Data available under Creative Commons.
Topic category	

Keyword set

keyword value	BOUNDARIES-Biophysical FLORA-Native
Originating controlled vocabulary	
Title	ANZLIC Search Words
Reference date	2008-05-16

Geographic location

West bounding longitude	152.79544
East bounding longitude	153.26203
North bounding latitude	-30.448434
South bounding latitude	-29.89739

Vertical extent information

Minimum value	-100
Maximum value	2228
Coordinate reference system	
Authority code	urn:ogc:def:cs:EPSG::
Code identifying the coordinate reference system	5711

Temporal extent

Begin position	2009-09-01
End position	N/A

Dataset reference date

Resource maintenance

Maintenance and update frequency	As needed
Contact info	
Contact position	Data Broker
Organisation name	NSW Department of Climate Change, Energy, the Environment and Water
Telephone number	131555
Email address	data.broker@environment.nsw.gov.au
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Responsible party role	pointOfContact

Lineage	Source data for this layer has two components, the floristic field based site data and the other being high resolution aerial photography. SITE DATA. An initial site data audit from the NSW VIS Flora Survey database was conducted to determine the full floristic (FF) sites of sufficient quality available for PATN statistical analysis. Statistical gap analysis and stratification identified remaining ecological gaps and a further 180 FF sites (funded by Coffs Council) were funded to target these gaps. A subsequent further review of sites determined a total of 534 FF sites for PATN analysis. PATN analysis produced 66 vegetation communities with floristic descriptions ready for mapping. In addition, a further 462 rapid data sites were funded by Coffs Council to inform the mapping. The rapid sites collected up to 5 dominant species for 6 levels of vertical strata at each site. An enormous achievement of this project was site density is almost equal across both vegetated freehold and public tenures, a normally unavoidable bias that plagues most multi tenure mapping programs. AERIAL PHOTOGRAPHY. The NSW Land and Property Management Authority (LPMA) captures airborne ADS40 4-band digital imagery at 50cm resolution for most of NSW. The Coffs Harbour (Sep 09), Dorrigo (Sep 09) and Bare Pt (June 10) 1:100k ADS40 tiles covered the Coffs LGA. Two levels of imagery were utilised for the project, the 4-band 2-dimensional orthorectified images and the Level 1 Rectified stereo image pair strips. The Level 1 data was used for 3-dimensional mapping in a GIS stereo environment. Significant spatial errors up to +- 30 metres between Level 1 and the orthorectified data were discovered. MAPPING PROCESS. Mapping was conducted by API/botanical experts in a stereo view workstation comprising of PLANAR monitors, ESRI ArcMap software and ERDAS Stereo Analyst software. The environment allows the direct delineation and attribution of polygons in 3D stereo view (Level 1 imagery) whilst simultaneously having a 2D context view and any number of additional datasets to guide mapping decisions. Interpreters had at their disposal all site data (733 sites) in 3D. Interpreters routinely collected field check points with GPS to help extrapolate across areas of difficult interpretability. A total of 2479 check points were collected for the project but points were constrained to publicly accessible areas and areas that were visually accessible from public roads or tracks. This fieldwork resulted in an additional 8 map units were added to the existing 72 classified communities as a result of findings from this fieldwork. The mapping was conducted at on screen at a range of scales but the final reference scale is deemed to be 1:5000. Linework was digitised using live streaming with a stream tolerance average of 5 metres ie a vertex every 5 metres. The study area was divided into 10 tiles for stereo mapping and the interpreters cross referenced each other whenever possible to help guide their mapping decisions. The tiles were stitched together in GIS and interpreters then reviewed the edges and remapped any inconsistencies. A final quality review of the stitched map was conducted by examining each community in isolation and reviewing it for errors and ecological distribution anomalies. This review process fed back in further refinements. Vegetation clearing from the Sapphire-to-Woolgoolga highway upgrade was applied to the map. A Worldview2 image captured on 7th Apr 2012 with 43cm spatial resolution was the baseline for delineating the highway clearing footprint. Due to the spatial accuracy issue between the Level 1 and ortho-rectified products, a final linework adjustment process for the study area was conducted using the orthorectified products as the accuracy reference. The focus of linework refinement was on vegetated/clearing interfaces, urban remnants, water bodies and other high contrast edges. Linework accuracy within contiguous vegetated areas were not systematically reviewed. All data stored and edited within ESRI File Geo-database format.
Limitations on public access	
Scope	dataset
DQ Completeness Commission	
Effective date	1901-01-01
DQ Completeness Omission	
Effective date	1901-01-01
DQ Conceptual Consistency	
Effective date	1901-01-01
Explanation	Geometry Appropriateness: Vegetation communities are delineated as polygons, suitable for the intended interpretation at property-level scales;Completeness of Attributes: All fields have values entered, where appropriateDomain Validation: Attribute domains not establishedConsistency and Appropriate Attribute Value/ Precision: Quantitative attribution as integers (appropriate). Qualitative attribution used consistently.Geometry Topology: Topology validation was performed with a tolerance of 0.2 metres and all subsequent gaps and overlapping polygons fixed. Topology is correct.Geodatabase XY

tolerance set at 0.2 metres and the resolution set at 0.1 metres. Record Duplication: Not AssessedTopological Relationship to Other Layers: Not applicable

DQ Topological Consistency

Effective date	1901-01-01
Explanation	Geometry Appropriateness: Vegetation communities are delineated as polygons, suitable for the intended interpretation at property-level scales;Completeness of Attributes: All fields have values entered, where appropriateDomain Validation: Attribute domains not establishedConsistency and Appropriate Attribute Value/ Precision: Quantitative attribution as integers (appropriate). Qualitative attribution used consistently.Geometry Topology: Topology validation was performed with a tolerance of 0.2 metres and all subsequent gaps and overlapping polygons fixed. Topology is correct.Geodatabase XY tolerance set at 0.2 metres and the resolution set at 0.1 metres. Record Duplication: Not AssessedTopological Relationship to Other Layers: Not applicable

DQ Absolute External Positional Accuracy

Effective date	1901-01-01
Explanation	not assessed

DQ Non Quantitative Attribute Correctness

Effective date	1901-01-01
Explanation	Reviewed Overall Accuracy (ROA) of attributes/ thematic classification has been determined as 77% (area weighted).Accuracy assessments for vegetation maps typically have three phases: a response design, a sampling design, and analysis and estimation (Stehman and Czaplewski, 1998). A response design can be a hard classification (or deterministic with a binary choice) or using a soft classification (fuzzy set) to allow for natural variations within vegetation and uncertainty in assigning a vegetation type (Schowengerdt, 1997). Accuracy assessments which apply the deterministic approach generally use an error matrix (or confusion matrix) to arrive at statistics for ‘user’ and ‘producer accuracy’ and ‘overall accuracy’. The diagonal elements of the error matrix represent agreement between the map and reference labels, and the off-diagonal elements reflect disagreements between the map and the reference labels. In fuzzy sets the row and column additions do not match correctly if applied to an error matrix and alternative methods are used to derive ‘overall accuracy’ (Stehman, et al 2007). For example, Gopal and Woodcock (1994) apply a ‘right’ function which is equivalent to the sum of the diagonal in an error matrix.In this study a fuzzy set was used in the response design, with a stratified random sampling design, and the Gopal and Woodock (1994) method was used for the estimation of overall accuracy. For the study area, a total of 279 stratified random plots, with a minimum of one plot per vegetation type and up to three plots for vegetation types with large areas were sampled. Plots were located at least 100m away from existing flora surveys (full floristic and rapid data points). A team independent of the map production process completed the accuracy assessment for the purpose of conducting a “blind” test. To achieve this, only the polygon outlines (without labelled vegetation communities) were initially provided for the accuracy assessment by OEH and plot locations were also prepared independently by the sampling design team for the field assessors.The plots were assigned to a vegetation community type using a fuzzy set (see degree of correctness Appendix 6 page 9). In the standards, a validation plot consists of recording the dominant species in each stratum, as well as the percentage cover for each species, and assigning each vegetation type a degree of correctness in the field. In this study, variations to the standard occurred in two areas:1) Percentage cover of each stratum was recorded rather than for each dominant species, and2) Matching to vegetation type using the fuzzy set occurred in the office rather than in the field.Results from the validation exercise were included in the final map product to make use of the additional field information and this was conducted in three stages:1) Plots and polygon labels were compared with accuracy assessment (AA) and any inconsistencies were corrected as follows:a. Point/polygon and AA in agreement – no changeb. Point/polygon and AA in disagreement (AA correct) – change mapped polygon (in part or all)c. Point/polygon and AA in disagreement (AA incorrect) – change AA but map is unchanged as original map label was found to be correct using information from the new and/or existing field data.2) Feedback from the public exhibition period were then included.3) Recommendations from the validation report implemented.The AA is for thematic map accuracy only, with no assessment of linework accuracy. The AA was reported using the following two statistics:1) Original Overall Accuracy (OOA) – the Gopal and Woodcock (1994) RIGHT function was reported as the OOA.2) Reviewed Overall Accuracy (ROA) – the ROA incorporates the above feedback and improvements to the map. Where no map changes can be justified from the field information available but the AA shows a mismatch, then the map was unchanged and the OOA reviewed to give the

ROA. Revisions only applied to situations described by 1(c) above to arrive at the ROA statistic. This figure was also a weighted accuracy where the accuracies of the individual classes were weighted by their areas (Gopal and Woodcock, 1994), so that improvements to vegetation classes with small areas only result in marginal improvements to ROA. A full report of the independent accuracy assessment (AA) was undertaken (Eco Logical Australia (2012)). The result of the accuracy assessment was an Original Overall Accuracy (OOA) of 66%.To improve the map product, polygon labels were compared to field plots to determine if the polygon label should be amended. Of the 279 AA plots, 31 plots were located in polygons which required no change when assessed against the new field information, resulting in an improvement of 11% with a Reviewed Overall Accuracy (ROA) of 77% (area weighted).

Responsible party

Contact position	Data Broker
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Responsible party role	pointOfContact

Metadata point of contact

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Metadata language