

Project summary: Geomorphic Wetlands Cervantes South Stage 2 project



Department of Environment and Conservation



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National Water Commission



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Project Summary: Cervantes South Wetland Mapping and Classification Project

This document summarises the methodology and results of the Cervantes South wetland mapping and classification project. Detailed methodology and results are described in the report *Wetland Mapping and Classification Cervantes South* (ENV 2010). The *Geomorphic Wetlands Cervantes South* dataset along with its associated metadata (Department of Environment and Conservation 2010) presents the resulting data. The dataset has been endorsed by the Wetland Status Working Group and the Wetland Coordinating Committee (WCC) as a Stage 2 mapping output.

The *Geomorphic Wetlands Cervantes South* (Area F) dataset project area is on the Swan Coastal Plain. It is within the Midwest region of Western Australia, and is located in the vicinity of Cervantes and Cataby in the Shire of Dandaragan. The project area is approximately 100,000ha and based on the land area encompassed by eight 1:25,000 map sheets. Wetland extent was identified and delineated and geomorphic types identified and classified using a range of information sources including Landsat satellite imagery, digital orthophotos, hard copy stereoscopic aerial photographs, topography, soil types, remnant vegetation and hydrography. The desktop mapping was verified at 29 individual wetlands and provided a measure of positional accuracy and attribute accuracy that could generally be applied to the dataset. These 29 wetlands represented approximately 4% of the total number of mapped wetlands and 8% of total mapped wetland area.

The mapping is considered suitable to be used at a scale of 1:25,000. As the mapping was conducted at 1:25,000 scale some wetlands in the project area are not included in the dataset as they are too small in size to be detected as individual entities at this scale. Subterranean and artificial wetlands, beaches and offshore islands were not included in the scope of the project.

A total of 770 wetlands were mapped in the project area and comprised approximately 20,221 ha of mapped wetland extent (approximately 20% of total project area). The wetland types mapped (and the relative extent) were Palusplains (52%), Floodplains (27%), Damplains (11%), Creeks (3%), Sumplains (3%), Balkarra (2%), Lakes (1%) and Rivers (0.3%). Positional accuracy of boundaries calculated from groundtruthing at a limited number of wetlands (29) was determined to be approximately 14m (range 1 – 45m) and attribute accuracy was 87%. The temporal resolution of the information used to determine wetland boundaries and classification was 22 years and was biased towards more recent information sources. The mapping may therefore underestimate or overestimate wetland extent or water permanence over a longer climatic period.

Introduction

The report, *Wetland Mapping and Classification Cervantes South* (ENV 2010), describes wetland identification, delineation, and classification methodologies for the study area, and the outcomes of their application to the study area. The *Geomorphic Wetlands Cervantes South* dataset (Department of Environment and Conservation 2010) presents the resulting data.

Form of inventory	Methodology	Application
Identification	✓	✓
Delineation	✓	✓
Classification	✓	✓
Evaluation	✗	✗

Funding

This project was managed by DEC Wetlands Section and funded by the Department of Water through the National Water Commission's Groundwater Action Plan Fund.

Study area

The project study area is approximately 100,000 hectares of the Midwest, within the Shire of Dandaragan, as shown in Figure 1.

Wetland mapping stage

The Wetlands Coordinating Committee, with the advice of its Wetland Status Working Group, has determined that the methodologies and their application to the study area, as described in *Wetland Mapping and Classification Cervantes South*, fulfil the requirements of a Stage 2 mapping project. Specifically the level of field sampling, the use of aerial photography, the 1:25,000 scale, the approximate boundaries of individual wetlands and the geomorphic classification fulfilled the criteria of a Stage 2 project. The elements of aerial photography, the 1:25,000 scale and the geomorphic classification also meet aspect of a Stage 3 project. Table 1 outlines key aspects of Stage 2 mapping projects.

Table 1. Primary stages of wetland mapping identified in DEC (2007).

Stage	Purpose/objective	Scale	Approach	Mapping	Mapped classification	Evaluation	Outcome
1	Broad wetland distribution	Regional	Reconnaissance Desktop 'Drive by'	Satellite imagery, aerial photographs, topography Map 'centroid' or approximate boundary 1:250,000 to 1:100,000 scale	Wetland vs. dryland	Existing data only No further evaluations	Quantify wetland resource
2	Asset evaluation, priority setting	Group of wetlands	Field sampling of sub-set and extrapolation of information	Aerial photograph. Precise or approximate boundaries 1:50,000 to 1:10,000 scale	Geomorphic wetland type	Preliminary indication of conservation value	Preliminary evaluation and prioritisation for future detailed assessment
3	Protection, management, environmental impact assessment	Individual	Individual wetland assessment in field	Aerial photographs (stereoscopic analysis). Precise boundaries 1:25,000 to 1:5,000 scale	Geomorphic wetland type	Detailed assessment of conservation value	Identification of values of individual wetlands as basis for protection, management and/or nomination.

Scale

The wetland identification, delineation and classification has been undertaken at a spatial resolution suitable for use at a scale of 1:25,000.

Relevant wetland types

The identification, delineation and classification of all wetland types listed in Table 2 are within the scope of the project. During the project, the wetland types shaded in Table 2 have been identified within the study area.

Table 2. Geomorphic wetland types formed by combining landform and hydroperiod attributes (after Semeniuk & Semeniuk 1995)

Hydroperiod	Landform				
	Basin	Channel	Flat	Slope	Highland
Permanent inundation	Lake	River	-	-	-
Seasonal inundation	Sumpland	Creek	Floodplain	-	-
Intermittent inundation	Playa	Wadi	Barlkarra	-	-
Seasonal waterlogging	Dampland	Trough	Palusplain	Paluslope	Palusmont

Completeness (wetland types mapped)

All natural geomorphic wetland types were attempted to be mapped (including channels). Beaches, wetlands on offshore islands, subterranean and artificial wetlands were not mapped. No Granite outcrops were identified in this project area.

Inclusiveness

No data is available on the inclusiveness of wetlands within the scope of the project. The minimum wetland polygon size is 173 m²; however this is not consistent across the wetlands in the project area or different wetland types. Wetlands may have been missed due to scale or other reasons and may be missed entirely or combined with other wetland polygons. Seasonally waterlogged basins, flats and channels and intermittently inundated basins, flats and channels are likely to be under-represented.

Statement of limitations

- The project sought to map all natural wetland types within the project area (including channel type wetlands) however not all the wetlands of these types have been mapped and the extent of mapping in any specific area should be confirmed at the time of use of the data. It should be noted that beaches, wetlands on offshore islands, subterranean and artificial wetlands were not within the scope of the mapping and are not included in the dataset.
- The mapping has been conducted at a scale of 1:25,000 and hence is only accurate for use at a scale of 1:25,000. Some wetlands have not been included in the dataset as they are too small in size to be detected. In some cases these wetlands will have been incorporated into a larger wetland polygon and in other cases entirely missed from the dataset. There is no data to indicate the number of wetlands that have been missed due to the 1:25,000 scale or due to other reasons applicable to this largely desktop survey.
- The boundaries are considered approximate and the positional accuracy statement provides only an indication of boundary accuracy.
- The temporal resolution of the information used to determine wetland boundaries and classification was 22 years and was biased towards more recent information sources. The mapping may therefore underestimate or overestimate wetland extent or water permanence over a longer climatic period.
- Wetlands were classified according to the prevailing hydrological conditions at the time. This classification may need to be re-examined if hydrological conditions are altered by irreversible anthropological effects or by cyclic climatic variability.

Positional accuracy

Boundaries of wetlands are approximate and to be used at a scale of 1:25,000. Positional accuracy for a sample of wetlands is provided for guidance only and boundary accuracy across the whole dataset may be larger or smaller than those sampled.

Groundtruthing was conducted for portions of boundaries at 29 of the 770 wetlands (4% of total number of wetlands, which equates to 8% of wetland area) and indicated average positional accuracy per site was 14m (Range: 3m – 37m). GPS accuracy of field recorded locations was +/- 5m and may result in an underestimate or overestimate of the accuracy measure calculated. There was variation between the number of each wetland type that was groundtruthed (range: 0 – 8 wetlands) and the average accuracy recorded for each of the wetland types (range: 7.7m – 15.7m).

Attribute Accuracy

Groundtruthing at a limited number of wetlands (N=29) found 87% accuracy in classification. However, this is not statistically significant due to the low sample size; therefore in using the data, a site specific assessment is required.

Associated datasets

The dataset produced from ENV's application of the identification, delineation and classification methodologies in the study area is entitled *Geomorphic Wetlands Cervantes South* dataset (DEC 2010). This dataset contains spatial data (wetland polygons) with associated attributes. DEC is the custodian of this dataset. For information on the dataset including metadata and data modification processes contact the Wetlands Section, DEC on 9334 0333.

Associated Reports:

ENV Australia Pty Ltd (2010), *Wetland Mapping and Classification Cervantes South*, prepared for the Department of Environment and Conservation, Western Australia.

Endorsement

Wetland mapping and classification Cervantes South (ENV 2010) and *Geomorphic Wetlands Cervantes South* dataset (DEC 2010) have been endorsed by:

- Department of Environment and Conservation
- Department of Water
- Wetland Status Working Group
- Wetlands Coordinating Committee

Recommended reference

The recommended reference for this publication is: DEC (2010) *Project Summary: Cervantes South Stage 2 wetland mapping and classification project*, Department of Environment and Conservation, Western Australia.

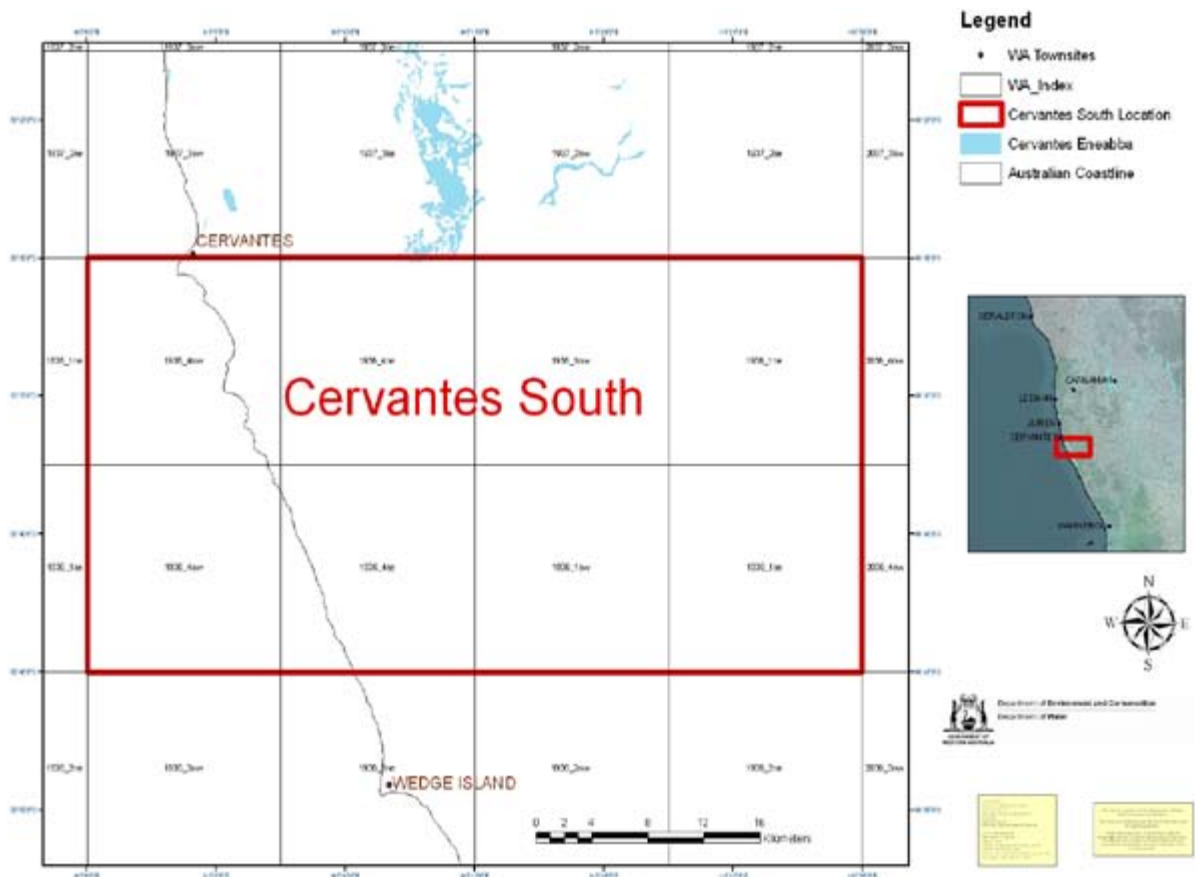


Figure 1: Geomorphic Wetlands Cervantes South (Area F) project area.