Executive Summary

This report summarises the methodology and results of the Darkan – Duranillin Wetland mapping and classification project in Area D. Detailed methodology and results are described in the report Wetland mapping and classification: Area D, Shire of West Arthur (ENV 2009). The Geomorphic Wetlands Darkan-Duranillin dataset (Department of Environment and Conservation 2009) presents the resulting data and has an attached metadata statement.

The Area D wetland mapping project area is within the Wheatbelt region of Western Australia and is located in the vicinity of Duranillin in the Shire of West Arthur. The project area is approximately 150,000ha and encompassed by nine 1:25,000 map sheets for the Middle Blackwood. Wetland extent was identified and geomorphic types identified and classified using a range of information sources including Landsat, orthophotos, hard copy stereoscopic aerial photographs, topography, soil types, remnant vegetation and hydrography. Approximately 10% of wetlands were visited in the field to groundtruth desktop outputs and to provide positional accuracy data. Artificial wetlands were not included in the scope of the project.

A total of 895 wetlands were mapped in the project area and comprised approximately 27,000 ha of mapped wetland extent (19% of total project area). The wetland types mapped (and the relative extent) were Creeks (25%), Floodplains (24%), Palusplains (23%), Damplands (16%), Sumplands (7%), Rivers (2%), Lakes (2%), and Paluslopes (0.4%). Positional accuracy of boundaries calculated from groundtruthing at a limited number of wetlands (73) was determined to be approximately 19m (range 0 – 88.5; standard deviation 16.8)

Introduction

The report, Wetland mapping and classification: Area D, Shire of West Arthur (ENV 2009), describes wetland identification, delineation, and classification methodologies for the study area, and the outcomes of their application to the study area. The Geomorphic Wetlands Darkan-Duranillin dataset (Department of Environment and Conservation 2009) presents the resulting data.

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

Publication details

The development of the methodologies and their application to the study area has been undertaken by ENV Australia Pty Ltd on behalf of the Western Australian Department of Environment and Conservation (DEC). The report was written by ENV.

Funding

This project was managed by the Wetlands Section, DEC and funded by the Natural Heritage Trust (NHT) and/or the National Action Plan for Salinity and Water Quality (NAP) which are joint initiatives of the Western Australian and Australian governments managed by the South west Catchments Council (SWCC).

Study area

The project study area is approximately 150,000 hectares of the south-west Wheatbelt, primarily within the Shire of West Arthur, as shown in Attachment 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: Area D, Shire of West Arthur,* fulfil the requirements of a Stage 2 mapping 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

Statement of limitations

- The project sought to map all natural wetland types within the project area (including channel type wetlands) however artificial wetlands were not within the scope of the mapping and are not included in the dataset.
- This mapping is to be used at a scale of 1:25,000. As mapping has been undertaken at 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.
- Granite rocks have not been delineated in this project area as those that were groundtruthed in the field were not considered to support wetlands. Granite rocks in the area should be individually assessed for their potential to support wetlands.
- 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 10–15 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 73 of the 895 wetlands (8.2%) and indicated average positional accuracy per site was 19.0 m (Range: 0m – 88.5 m; Standard Deviation: 16.8 m). GPS accuracy of field recorded locations was ≤5 m and may result in an underestimate or overestimate of the accuracy measure calculated. There was variation between the percentage of each wetland type that was groundtruthed (average: 11.8% range: 5.9% – 29.2%) and the accuracy recorded for each of the wetland types (average: 24 metres; range: 11.9m – 59.4m; N = 1 – 31 wetlands).

Associated datasets

The dataset produced from ENV's application of the identification, delineation and classification methodologies in the study area is entitled *Geomorphic wetlands Darkan-Duranillin* dataset (DEC 2009). 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.

Endorsement

Wetland mapping and classification: Area D, Shire of West Arthur (ENV 2009) and *Geomorphic wetlands Darkan-Duranillin* dataset (DEC 2009) 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: ENV Australia Pty Ltd (2009), *Wetland mapping and classification: Area D, Shire of West Arthur*, prepared for the Department of Environment and Conservation, Department of Environment and Conservation, Western Australia.

Attachment 1: Location of 'Area D'