ACT NOW FOR THE FUTURE

Department of Environment and Conservation

Our environment, our future

Protocol for proposing modifications to the *Geomorphic Wetlands Swan Coastal Plain* dataset

Introduction

This document outlines the Department of Environment and Conservation (DEC) protocol for updating the *Geomorphic Wetlands Swan Coastal Plain* dataset (the dataset). It supersedes the *Water and Rivers Commission Protocol for re-evaluation of a wetland management category* (Water and Rivers Commission 2001). For information on DEC's position on wetlands of the Swan Coastal Plain please refer to DEC Wetlands Program internet site at **www.dec.wa.gov.au/wetlands** > Publications > Policy > Wetlands Position Statement.

DEC is cognisant that wetland values or area can change, either through natural or anthropogenic processes, and that a dataset modification may be required. A modification to the dataset can be requested if it is considered that the management category or boundary of a wetland is incorrect, or has been altered. This protocol outlines the information that should be provided to DEC when requesting a modification to the dataset.

The dataset displays the location, boundary, geomorphic classification (wetland type) and management category of wetlands on the Swan Coastal Plain. The information contained within the dataset was originally digitised from the *Wetlands of the Swan Coastal Plain Volume 2B Wetland Mapping, Classification and Evaluation: Wetland Atlas*, which was captured at a scale of 1:25,000 (Hill et al. 1996b). Numerous resources and methods were used in geomorphic mapping of the Swan Coastal Plain wetlands, including an initial desktop study of aerial photographs (capturing various seasons, where possible), regional geology and soil maps, and topographic maps; a field survey where the vast majority of wetlands were visited; data reduction of field and desktop work; and final orthophotomapping (Hill et al. 1996a).

The dataset has been recognised and endorsed by the Wetlands Coordinating Committee (comprising representatives from DEC, Department for Planning and Infrastructure (DPI), Department of Agriculture and Food, local government, the voluntary conservation movement and a non-government wetland scientist), the Environmental Protection Authority (EPA) and the DPI as the most comprehensive wetland mapping, classification and evaluation work on the Swan Coastal Plain. The dataset is identified and utilised by the EPA and DPI as a basis to guide planning and decision making.

DEC is the custodian of the dataset and is responsible for maintaining and updating the information within it. The dataset can be viewed at *Geographic Data Atlas*, Department of Environment and Conservation site: **www.dec.wa.gov.au** > Department of Environment > Tools, systems and data > Geographic Data Atlas (cadastre available).

A guide to viewing the dataset on the *Geographic Data Atlas* is available at **www.dec.wa.gov.au/wetlands** > Data > Wetland Mapping. The dataset can be downloaded via the *Geographic Data Atlas* (a fee may apply for commercial uses) or alternatively, it can be requested from DEC by contacting the Geographical Information Systems Support Analyst Officer on 6364 6500. Private landowners may contact the relevant DEC regional office to request a hard copy of the wetland mapping on their property.

Since publication and subsequent digitising of the Hill et al. (1996b) mapsheets, the dataset has been frequently updated. However, inaccuracies may exist in the dataset due to its large size (it covers approximately 362,000 ha of wetland area) and the scale of capture compared to the scale at which it is viewed.

This protocol details the information that DEC requires when assessing a request to modify the dataset. It is not a method for wetland identification, delineation, classification or evaluation. Wetland identification, delineation, classification and evaluation methods are described in Hill et al. (1996a) and the wider scientific literature (e.g. Tiner 1999). In addition, DEC is currently preparing an evaluation method guideline to assign wetland management categories, which will consolidate and replace the evaluation method in Hill et al. (1996a), V & C Semeniuk Research Group (1998) and the EPA Bulletin 686 *A Guide to Wetland Management in the Perth and Near Perth Swan Coastal Plain Area* (EPA 1993).

Wetland identification and delineation

Identification and delineation of a wetland is reliant upon characteristics of hydrology, hydric soils and wetland vegetation (Hill et al. 1996a). Ideally, a request to modify a wetland boundary or demonstrate the presence/absence of a wetland should provide information addressing all three wetland determining characteristics.

A wetland is defined in Schedule 5 of the *Environmental Protection Act 1986* as:

'wetland' means an area of seasonally, intermittently or permanently waterlogged or inundated land, whether natural or otherwise, and includes a lake, swamp, marsh, spring, dampland, tidal flat or estuary.

Hydrology

Hydrology is dynamic and varies annually, seasonally and between wetlands. As such, long term data in combination with information on basin morphology are required to accurately assess surface water and groundwater levels and patterns (Tiner 1999). For those wetlands that are surface expressions of the groundwater table, a single groundwater level reading may not reflect the groundwater table across an entire wetland. For example, vegetation is known to affect wetland hydrology (Tiner 1999) and may influence groundwater levels across the wetland. Analysis of site specific topographical and groundwater contours may provide an indication of inundated or waterlogged areas.

Hydric soils

Hydric soils (i.e. soils formed in response to prevailing inundation or waterlogging (Hill et al. 1996)) are a long term wetland determining characteristic and form a basis for wetland delineation in association with vegetation and hydrology. However, when wetland vegetation has been altered or removed and the hydrology is difficult to determine, hydric soils may be the only reliable wetland indicator remaining. Information on the hydric soils of the Swan Coastal Plain is detailed in Semeniuk & Semeniuk (2004).

Wetland vegetation

Wetland vegetation reflects hydrology and hydric soils. In particular, obligate wetland species (i.e. those plants generally restricted to wetland habitats) are considered reliable wetland indicators (Tiner 1999). On the Swan Coastal Plain, when considering wetland identification and delineation, it is also important to note that facultative species (i.e. those plants that can occur in wetland and dryland habitats) can be common, notably in dampland and palusplain wetlands, or peripheral to sumpland and lake wetlands. It is therefore important to recognise the opportunism and longevity of species, both obligate and facultative, in response to disturbance and changing environmental conditions where annual rainfall is variable. For example, when the climate is drier than in previous years, there may be a combination of opportunistic short-lived facultative species and longer lived obligate species co-inhabiting a wetland environment. It is also important to consider flora species in the context of their location on the Swan Coastal Plain, the vegetation community and the density of species occurrence.

Geomorphic wetland classification

Wetlands on the Swan Coastal Plain have been classified using a geomorphic wetland classification system based on the characteristics of landform and water permanence (see Table 1 below).

Table 1. *Wetland types defined within the global geomorphic classification system, adapted from Semeniuk & Semeniuk 1995.*

	BASIN	**FLAT**	**CHANNEL**	**SLOPE**
Permanently inundated	Lake		River	
Seasonally inundated	Sumpland	Floodplain	Creek	
Seasonally waterlogged	Dampland	Palusplain		Paluslope

Geomorphic wetland mapping and classification on the Swan Coastal Plain has identified the extensive and diverse nature of the region's wetlands, in particular, recognising the dominance of seasonally waterlogged wetlands. Wetland mapping and classification is fundamental for appropriate land use planning and increased wetland protection and management (Hill et al. 1996a).

Evaluation to assign a wetland management category

Evaluation of wetlands is the process of assessing and documenting a wetland's values by considering information about its attributes and functions. The Swan Coastal Plain wetlands have been evaluated and assigned an appropriate management category (displayed in the dataset), providing guidance on the nature of the management and protection the wetland should be afforded.

Wetland evaluation considers the inter-related values of a wetland and therefore the management category should represent the entire geomorphic wetland without being constrained to cadastral boundaries. However, in the case of extensive wetlands (generally of greater than 70 ha and excluding lakes and sumplands (Hill et al. 1996a)) which have been disturbed, a separate management category will be assigned to portions of a wetland in order to reflect the remaining values. This approach recognises the diverse condition and land uses of extensive wetlands, and the importance of remnant wetland vegetation. It is acknowledged that access to all areas of a geomorphic wetland may not be possible due to property ownership, however, as much information as possible should be submitted.

Please note that the evaluation process to assign a management category is a scientific assessment of wetland values and should not be viewed as a means to facilitate or prevent development proposals. In assessing requests to modify the dataset, DEC does not consider any associated development proposals. Inquiries relating to the environmental impacts of land use planning issues should be directed to the relevant regional office of DEC.

Procedure to request modification to the dataset

To reduce the potential for delays, dataset modification requests should be submitted prior to any application to develop, subdivide or rezone land, or any outline development plan or structure plan. Furthermore, a planning proposal is likely to be considered in the context of the current wetland mapping. When a wetland is proposed to be modified to Conservation category a proposal is unlikely to be progressed until the dataset request is finalised.

Please note that if the wetland is subject to an investigation under the *Environmental Protection Act 1986* for environmental harm or unauthorised clearing of native vegetation, DEC can not assess a request to modify the dataset until the investigation is complete.

Step 1 – Submit documentation

A written request (preferably double sided) must be submitted to the Coordinator, Wetlands Program (see address at the end of this protocol) detailing the justification for a modification to the dataset, by providing the appropriate documentation as outlined below. Any other information regarding characteristics, functions or attributes of the wetland that may be relevant to the assessment, should also be submitted.

***Table 2**. Information required to be submitted in requests to modify the dataset.*

	Identification and delineation[1]	**Management category**[2]
Compulsory information	A and B	A, C and D
Additional information		E

(Footnotes)

1 Includes requests to modify wetland boundaries and changes to 'No longer a wetland' or 'Dryland'. **No longer a wetland:** those areas that were previously identified as wetland but no longer display wetland characteristics, due to natural (eg. sediment accretion) or anthropogenic causes (e.g.filled for development). **Dryland:** those areas which reflect dryland characteristics and may have been incorrectly identified as wetland on the dataset.

2 Includes requests to modify wetland management categories (i.e. Conservation, Resource Enhancement and Multiple Use) and the associated management category boundaries.

Expertise required

Wetland identification and delineation, classification and evaluation require specialised field, laboratory and desktop investigations skills. Wetland assessments should be coordinated and led by professionals with specific expertise and experience in wetland processes (e.g. wetland ecology, hydrology and sedimentology). An understanding of the dynamic nature of wetlands and their response to seasonal conditions and longer term climate variability is particularly important.

DEC acknowledges that local government authorities, non-government organisations and private landowners may require assistance, particularly when additional wetland areas of conservation significance are identified. In this regard, DEC does not expect not-for-profit organisations to engage wetland specialists in order to update the dataset. DEC will support and assist an individual or organisation providing additional information that contributes to wetland protection and management in Western Australia.

A) Visual justification

The following material must be submitted:

- wetland location, including lot number, house number, street name, locality and coordinates (when a wetland is difficult to locate)
- the wetland Unique Feature Identifier (UFI) number, available from the dataset
- on-ground colour photographs of the wetland (from all directions, including within the wetland core, across the wetland boundary and across lot boundaries) showing:
  - all vegetation units throughout the wetland
  - the variety of vegetation condition of the wetland
  - any other relevant features of the wetland
- a clear, recent (i.e. less than 2 years old, if available), colour aerial photograph/s of the area (with the date noted), overlaid with the following:
  - the current wetland mapping with the location and direction of photograph points illustrated
  - the current and proposed wetland mapping, including wetland boundaries and management categories
- a description and map of the vegetation units

It is important to note that on-ground photographs should ideally be taken after the main period of rainfall (September–November), to demonstrate wetland condition in an optimal state. In some circumstances, a request may not be able to be processed until the appropriate season. Requestors should be mindful of seasonal variation when justifying condition.

B) Wetland identification and delineation

Wetlands on the Swan Coastal Plain are recognised for their diverse hydrology, soils and vegetation. As such, the information required in a request to modify the geomorphic wetland boundary, will depend on the individual wetland's characteristics and the proposed dataset modification. Ideally, a combination of wetland determining characteristics (i.e. hydrology, soils or vegetation) should be described and discussed. A request based on a single characteristic may not provide sufficient justification for the modification of a wetland boundary.

It is important to submit as much information as possible in order to justify the proposed modification to the dataset. While requests are likely to concentrate on the areas in question, the information should be described and discussed in the context of the entire geomorphic wetland. It is also recommended that the accuracy of the spatial datasets being utilised are considered when preparing a request. Proposed wetland boundaries should consider the entire geomorphic wetland and not be restricted to cadastral boundaries or a particular study area.

The following information should be submitted, depending on the wetland characteristics and the proposed modification.

Hydrological information including:

- aerial photographs overlaid with topographical (e.g. *Topographic Contours,* Department of Land Information) and groundwater contours (e.g. *Groundwater Contours,* Department of Water), and the geomorphic wetland type boundary from the current dataset

- any available groundwater data (e.g. *Perth Groundwater Atlas,* Department of Water)
- site specific profile of maximum groundwater level across the wetland (i.e. from on-site hand auger holes, incorporating measurements from the wetland centre and margins)
- visual observations or indicators of inundation or waterlogging (e.g. water marks).

Soil information including:

- available information from existing maps and databases (e.g. *Atlas of Australian Soils for Western Australia,* Department of Agriculture)
- evidence of hydric soils (e.g. peats, peaty sands and carbonate muds)
- evidence of an impervious layer (e.g. clay, laterite)
- evidence of anthropogenic fill
- soil profile analyses from the centre and margins of the wetland (i.e. description of the soil components from an auger sample e.g. at 10cm intervals along the core) and the date and location of auger sample sites illustrated on an aerial photograph
- evidence of biogenesis associated with waterlogging or inundation (e.g. algal or invertebrate remains)
- evidence of biochemical processes associated with waterlogging or inundation (e.g. mottling)
- analyses of the variation between wetland and dryland soil profiles discussing:
  - the existing mapped wetland (as per the dataset)
  - the area proposed for modification
  - the area outside of the existing mapped wetland (i.e. dryland).

It is important to note that the use of broad scale soil mapping (e.g. 1:250 000) is not considered sufficient for site specific wetland delineation.

Vegetation information including:

- a vegetation survey in accordance with EPA Guidance Statement No. 51 *Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (EPA 2004b) at the level of a 'detailed survey'
- the vegetation survey should include:
  - at least one sample plot (10m x 10m) per mapped vegetation unit with additional plots to demonstrate the variation of floristics and condition within the unit
  - location of the plot sites illustrated on an aerial photograph
  - a description of the vegetation units including the variation between plots within a unit
  - a comprehensive flora list
  - vegetation unit mapping
- analyses of the variation between wetland and dryland vegetation units discussing:
  - the existing mapped wetland (as per the dataset)
  - the area proposed for modification
  - the area outside of the existing mapped wetland (i.e. dryland).

It is important to note that the absence of wetland vegetation alone, does not provide sufficient justification for an existing mapped wetland area to be modified to 'No longer a wetland'. Where wetland vegetation has been cleared, a wetland may still retain hydrological or ecological functions, cultural or scientific values.

C) Desktop study of wetland values

All known existing information should be included to aid in the description of wetland values. In addition to the recognition mechanisms listed below, other studies of importance should be researched (e.g. local government studies).

Please use the checklist below to determine whether the wetland is currently recognised through the following:

- *Ramsar List of Wetlands of International Importance*
- *A Directory of Important Wetlands in Australia*
- *Register of the National Estate*
- *Conservation Reserves for Western Australia The Darling System–System 6* (Department of Conservation and Environment 1983)
- *Environmental Significance of Wetlands in the Perth to Bunbury Region* (LeProvost, Semeniuk & Chalmer 1987)
- *A Systematic Overview of the Environmental Values of the Wetlands, Rivers and Estuaries of the Busselton–Walpole Region* (Pen 1997)
- *Bush Forever* (Government of Western Australia 2000)
- *Aboriginal Sites Register System* (Department of Indigenous Affairs).

It is the requestor's responsibility to comprehensively research all of the available information and relevant studies on a wetland's values. Please note that absence from the above checklist does not indicate low wetland values or that no information is available.

D) Wetland vegetation condition assessment

Vegetation condition can be used to reflect the naturalness of a wetland. Vegetation condition assessment is particularly applicable to vegetated wetland systems such as damplands, palusplains and many sumplands that often support natural vegetation over a large area of the wetland. There are a number of vegetation condition scales, however, DEC has adopted the scale used in *Bush Forever* (Government of Western Australia 2000). A copy of the *Bush Forever* vegetation condition scale is available at **www.dec.wa.gov.au/wetlands** > Data > Wetland Mapping.

Please refer to pages 46-49 of Volume 2 of *Bush Forever* for more information on vegetation condition assessment. Vegetation condition assessment is best undertaken by a botanist or persons suitably experienced in assessing wetland vegetation condition, as an understanding of natural vegetation characteristics and seasonal variation is required. Vegetation condition ratings should be comprehensively demonstrated using descriptions, mapping and suitable photographs.

E) Bulletin 686 method

EPA Bulletin 686 *A Guide to Wetland Management in the Perth and Near Perth Swan Coastal Plain Area* was published in 1993 and provides a preliminary broad brush evaluation methodology using a two part questionnaire. Bulletin 686 is more applicable to open water wetland types such as lakes

and to a lesser extent sumplands. DEC is currently preparing a guideline outlining an evaluation method to assign management categories, which will supersede Bulletin 686. This is in recognition that Bulletin 686 is not well equipped to recognise wetland condition, floristic complexities, less conspicuous fauna, and functions and values present in systems such as dampland and palusplain wetlands.

DEC recommends that Bulletin 686 be used as a guideline for the type of information to discuss in requests to modify the wetland management category. However, the other criteria and evaluation methods described in Chapter 5 of Hill et al. (1996a) and V & C Semeniuk Research Group (1998) should also be referred to. The result of the Bulletin 686 Questionnaire is considered within the context of all available information when assessing a wetland re-evaluation request, however, it is not the sole determinant of a wetland management category. Bulletin 686 is available at **www.epa.wa.gov.au** > EPA Bulletins > Archives.

Answers to the Bulletin 686 questionnaire should be detailed, including scores with adequate justification and associated documentation. When answering Part I of the questionnaire, if it is considered that the wetland is not habitat for rare species of flora and fauna, comprehensive justification must be provided, using desktop information and the 'detailed survey' methods and reporting information presented in EPA Guidance Statement 56 *Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia* (EPA 2004a) and EPA Guidance Statement 51 *Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (EPA 2004b). DEC should be consulted regarding database searches to identify Threatened Ecological Communities, Declared Rare and Priority flora, and Specially Protected Fauna.

Step 2 – Request registered

Upon receipt, DEC will enter the request into the 'The *Geomorphic Wetlands Swan Coastal Plain* dataset – Proposed Modifications Database'. The requestor will be notified if the initial information received is inadequate and the request will only be progressed when the required information is received. Requests are generally reviewed according to the date of receipt, however, requests that propose to modify a wetland to Conservation category will be given priority. Please note that DEC undertakes a comprehensive review of requests to modify the dataset and, depending upon the complexity of the request and the number of requests waiting to be actioned, this may take time to complete. DEC will notify the requestor if it is considered that additional information is required to assist in the review and assessment process.

Step 3 – Determination

Following review of the request it may be necessary for DEC to visit the wetland site to verify the information provided or collect additional information. DEC will contact the requestor if a site visit is required. The site visit should be arranged and facilitated by the requestor and include landowner approval and the provision of safe access onto the property.

In providing a determination of the request, DEC will consider all facets of the wetland's functions and attributes, and will not be confined to the scope of information presented. In order to incorporate some of the longer term aspects of natural resource management into wetland evaluation and identification, consideration will be given to the precautionary principle, inter-generational equity and climatic patterns.

DEC will advise the requestor of the outcome in writing. If a requestor disagrees with a determination the requestor should, in the first instance, provide additional information to the Wetlands Program. If the additional information does not provide sufficient justification the request will be forwarded to the Director General for review and final decision.

Current date of protocol and dataset

This protocol is a dynamic document and may be changed at the discretion of DEC as more information becomes available. Please ensure that you are using the most up to date version of the protocol, which is available at **www.dec.wa.gov.au/wetlands** > Data > Wetland Mapping.

The dataset is updated on a regular basis. It is therefore recommended that the most recent version of the dataset is referred to when preparing requests. Please confirm the current date of the dataset at **www.dec.wa.gov.au/wetlands** > Data > Wetland Mapping.

References

Department of Conservation and Environment 1983, *Conservation Reserves for Western Australia The Darling System–System 6,* Department of Conservation and Environment, Perth.

Department of Environment and Conservation, *Geomorphic Wetlands Swan Coastal Plain* dataset, Department of Environment and Conservation, Perth.

Environmental Protection Authority 1993, *A Guide to Wetland Management in the Perth and Near Perth Swan Coastal Plain Area*, Bulletin 686, Environmental Protection Authority, Perth.

Environmental Protection Authority 2004a, *Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia,* Guidance Statement 56, Environmental Protection Authority, Perth.

Environmental Protection Authority 2004b, *Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia,* Guidance Statement 51, Environmental Protection Authority, Perth.

Government of Western Australia 2000, *Bush Forever Volume 2: Directory of Bush Forever Sites,* Department of Environmental Protection, Perth.

Hill, AL, Semeniuk, CA, Semeniuk, V & Del Marco, A 1996a, *Wetlands of the Swan Coastal Plain Volume 2A: Wetland Mapping, Classification and Evaluation, Main Report,* Water and Rivers Commission and Department of Environmental Protection, Perth.

Hill, AL, Semeniuk, CA, Semeniuk, V & Del Marco, A 1996b, *Wetlands of the Swan Coastal Plain Volume 2B: Wetland Mapping, Classification and Evaluation, Wetland Atlas*, Water and Rivers Commission and Department of Environmental Protection, Perth.

LeProvost, Semeniuk & Chalmer 1987, *Environmental Significance of Wetlands in the Perth to Bunbury Region,* Western Australian Water Resources Council, Leederville.

Pen, L 1997, *A Systematic Overview of the Environmental Values of the Wetlands, Rivers and Estuaries of the Busselton–Walpole Region,* Water and Rivers Commission, East Perth.

Semeniuk, CA & Semeniuk, V 1995, 'A geomorphic approach to global classification for inland wetlands', *Vegetatio* 118: 103-124.

Semeniuk, V & Semeniuk, CA 2004, 'Sedimentary fill of basin wetlands, central Swan Coastal Plain, southwestern Australia. Part 1: sediment particles, typical sediments, and classification of depositional systems', *Journal of the Royal Society of Western Australia* 87: 139-186.

Tiner, RW 1999, *Wetland Indicators: A Guide to Wetland Identification, Delineation, Classification and Mapping,* Lewis Publishers, Florida.

V & C Semeniuk Research Group 1998, *Evaluation of Wetlands of the Southern Swan Coastal Plain,* unpublished report for the Water & Rivers Commission, East Perth.

Water and Rivers Commission 2001, *Water and Rivers Commission Position Statement: Wetlands,* Water and Rivers Commission, East Perth.

Other reading

Balla, S 1994, *Wetlands of the Swan Coastal Plain Volume 1: Their nature and management,* Department of Environmental Protection and Water Authority, Perth.

Department of Water 2004 – , *Stormwater Management Manual for Western Australia,* Department of Water, Perth.

Environment Australia 1997, *The Wetlands Policy of the Commonwealth Government of Australia,* Australian Government, Canberra.

Environmental Protection Authority 2004, *Environmental Protection of Wetlands,* Position Statement No. 4, Environmental Protection Authority, Perth.

Environmental Protection Authority 2005, *Environmental Guidance for Planning and Development,* Draft Guidance Statement No. 33, Environmental Protection Authority, Perth.

Government of Western Australia 1997, *Wetlands Conservation Policy for Western Australia,* Government of Western Australia, Perth.

Government of Western Australia 2003, *Hope for the future: The Western Australian State Sustainability Strategy,* Government of Western Australia, Perth.

Semeniuk, CA 1987, 'Wetlands of the Darling System–A geomorphic approach to habitat classification', *Journal of the Royal Society of Western Australia* 70: 69-87.

Information Sources

Aboriginal Sites Register System available from:
Heritage Information, Department of Indigenous Affairs
Level 1, 197 St Georges Tce, Perth WA 6000
Ph: 9235 8000
www.dia.wa.gov.au

Atlas of Australian Soils for Western Australia available from:
Digital Data Administrator, Department of Agriculture
3 Baron-Hay Court, South Perth WA 6151
Ph: 9368 3333
www.agric.wa.gov.au

Bush Forever (Government of Western Australia 2000)
Volume 1: Policies, Principles and Processes available from: **www.dia.wa.gov.au** > City and regional planning > City planning > Bush Forever
Volume 2: Directory of Bush Forever Sites is available from: DEC library, The Atrium, 168 St Georges Tce, Perth

Directory of Important Wetlands in Australia (Department of the Environment and Heritage) available from: **www.environment.gov.au** > Inland Waters > Wetlands > Databases and Information > Australian Wetlands Database

Evaluation of Wetlands of the Southern Swan Coastal Plain (V & C Semeniuk Research Group 1998) available from: Department of Environment and Conservation library

Geographic Data Atlas available from : **www.dec.wa.gov.au** > Department of Environment > Tools, systems and data > Geographic Data Atlas

Groundwater Contours available from: *Perth Groundwater Atlas*

Perth Groundwater Atlas available from: **www.water.wa.gov.au** > Tools, systems and data > Perth Groundwater Atlas

Ramsar List of Wetlands of International Importance available from: **www.ramsar.org** and **www.environment.gov.au** > Inland Waters > Wetlands > Databases and Information > Australian Wetlands Database

Register of the National Estate available from: **www.ahc.gov.au** > Register of the National Estate

Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia Guidance Statement 51 available from: **www.epa.wa.gov.au** > Environmental Impact Assessment > Guidance Statements

Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia Guidance Statement 56 available from: **www.epa.wa.gov.au** > Environmental Impact Assessment > Guidance Statements

Topographic Contours available from:
Data Support Officer, Department of Land Information
1 Midland Square, Midland WA 6056
Ph: 9273 7373

www.landgate.wa.gov.au

WetlandBase – The Western Australian Wetlands Database (DEC) available from:
www.naturebase.net > Nature & Biodiversity > Wetlands > Wetlands Database Project

The *Wetlands Conservation Policy for Western Australia* is available from: **www.naturebase.net** > Nature & Biodiversity > Wetlands > Our Role> Wetlands Conservation Policy

The *Wetlands of the Swan Coastal Plain* series are available from:
www.dec.wa.gov.au/wetlands > Publications > Wetlands of the Swan Coastal Plain

Western Australian Land Information System available from: **www.walis.wa.gov.au**

Glossary available from: **www.dec.wa.gov.au**

This Protocol was produced by the Wetlands Program, Department of Environment and Conservation, February 2007.

The recommended reference for this publication is: Department of Environment and Conservation 2007, *Protocol for proposing modifications to the 'Geomorphic Wetlands Swan Coastal Plain' dataset,* Department of Environment and Conservation, Perth.

Address: **Coordinator, Wetlands Program, DEC**
17 Dick Perry Avenue, Technology Park, Kensington WA 6151
Postal: **Locked Bag 104, Bentley Delivery Centre WA 6983**

Telephone: 9334 0333

DEC Internet: **www.dec.wa.gov.au**

Wetlands page: **www.dec.wa.gov.au/wetlands**

ACT NOW FOR THE FUTURE

Department of Environment and Conservation
Our environment, our future

2008217-0508-50