Statewide wetland geospatial inventory update

Factsheet 7: Method to classify wetland origin

Purpose
This Factsheet describes the method used to classify wetland origin.

Intent of the classification
The new Victorian Wetland Classification Framework adopts two categories of wetland origin:

Naturally occurring	Wetlands of natural origin which essentially retain their natural form, even if they are now used for a utilitarian purpose such as salt harvesting, water storage, cropping or saline water disposal
Human-made	Purpose built wetlands, may have replaced naturally-occurring wetland

Within the human-made wetlands classification, the Framework adopts seven subcategories of wetland origin:

Aquaculture ponds	e.g. fish/shrimp ponds
Farm dams	e.g. farm ponds, stock ponds, small tanks (generally below eight hectares)
Salt works	e.g. salt exploitation sites (e.g. salt pans)
Water storages over eight hectares	e.g. water storage areas, reservoirs/barrages/dams/impoundments
Excavation ponds	e.g. gravel/brick/clay pits; borrow pits, mining pools
Sewage treatment ponds	e.g. sewage farms, settling ponds, oxidation basins
Stormwater treatment ponds	e.g. constructed wetlands for stormwater treatment and/or amenity

Data sources
The approach utilised multiple lines of evidence to classify the most likely wetland origin, based on six independent data sources:

Dataset name	Dataset description / link
Wetland 1788	Wetland 1788 dataset revised through this project
Wetland 1994	Classification of wetland type assigned during the Wetland 1994 mapping and any subsequent refinement
All Victorian Dam Boundaries	A dataset developed for DEPI by SKM that maps dams across Victoria (unpublished)
DRWaterbodies	Melbourne Water's stormwater assets database (unpublished)
Water area 1:25,000	Polygon features delineating hydrological features, including lakes, flats (subject to inundation), wetlands, pondages (saltpan and sewage), watercourse areas, rapids and waterfalls http://services.land.vic.gov.au/rhok/Metadata/HY_WATER_AREA_POLYGON.htm
Features of interest	A dataset intended to describe and record the location of features of interest as supplied by an authoritative source, including features such as education centres, landmarks, geographical points, mines http://www.dse.vic.gov.au/__data/assets/pdf_file/0018/142470/Vicmap-Features-of-Interest-Prod-Desc-V1_1.pdf

Method
The first step involved identifying whether the Wetland 2013 feature was also included in the original Wetland 1788 dataset. If the Wetland 2013 feature was is ± 40% the size of the Wetland 1788 feature than it was assumed to be naturally occurring. If the Wetland 2013 feature was >40% larger than the Wetland 1788 features it was assumed to be human-made as wetlands that have enlarged since European settlement are typically a result on modifications (such as construction of sewerage treatment

systems, dams and water storages) – conversely it is rare for a wetland to have increased extent since European settlement without human modifications to its form.

Features sourced from the 'ALPS', 'GB_SPR' or 'GB_SS' datasets were also classified as naturally occurring as part of the first step.

In the second step, any features derived from Wetland 1994 with a Corrick class of '20 - Sewage treatment pond' were classified as 'human-made, sewage treatment pond'.

The next step comprised spatial overlay analysis of the remaining four datasets. These datasets each have one or more attributes that provides some information on whether a given wetland was likely to be naturally occurring or human made; the 'water area 1:25,000' had three relevant attributes (Attachment A). The intent of the spatial overlay analysis was to infer the wetland origin based on the existing attribute information in the four datasets. This relied upon the features in each of the four datasets having been classified as either naturally occurring, or human made, and if possible distinguishing what form of human made wetland they comprised (refer to Attachment A for how these were assigned).

Based on the spatial overlay analysis with the four datasets each wetland was classified into one of the following classes, with a confidence rating assigned depending on whether the four datasets provided consistent or conflicting classifications of a single wetland.

Wetland origin classification	Confidence of classification	Basis for classification
Naturally occurring	High	Wetland source from 'ALPS', 'GB_SPR' or 'GB_SS' datasets OR Spatial overlay analysis suggested the wetland was generally of this origin, with consistent classification results between the four datasets
	Moderate	Size of the Wetland 2013 feature is ± 40% the size of corresponding Wetland 1788 feature OR Spatial overlay analysis suggested the wetland was generally of this origin, with only minor conflicting classification results between the four datasets
	Low	Spatial overlay analysis suggested the wetland was generally of this origin, although there was significant conflicting classification results between the four datasets
Aquaculture ponds	High	Spatial overlay analysis suggested the wetland was generally of this origin, with consistent classification results between the four datasets
	Moderate	Did not occur in dataset
	Low	Did not occur in dataset
Dam / Storage	High	Spatial overlay analysis suggested the wetland was generally of this origin, with consistent classification results between the four datasets
	Moderate	Spatial overlay analysis suggested the wetland was generally of this origin, with only minor conflicting classification results between the four datasets
	Low	Spatial overlay analysis suggested the wetland was generally of this origin, although there was significant conflicting classification results between the four datasets
Excavation ponds	High	Spatial overlay analysis suggested the wetland was generally of this origin, with consistent classification results between the four datasets
	Moderate	Spatial overlay analysis suggested the wetland was generally of this origin, with only minor conflicting classification results between the four datasets
	Low	Spatial overlay analysis suggested the wetland was generally of this origin, although there was significant conflicting classification results between the four datasets
Salt works	High	Spatial overlay analysis suggested the wetland was generally of this origin, with consistent classification results between the four datasets
	Moderate	Did not occur in dataset
	Low	Did not occur in dataset
Sewage treatment ponds	High	Wetland classified as a sewage treatment pond in Wetland 1994 OR Spatial overlay analysis suggested the wetland was generally of this origin, with consistent classification results between the four datasets
	Moderate	Spatial overlay analysis suggested the wetland was generally of this origin, with only minor conflicting classification results between the four datasets
	Low	Spatial overlay analysis suggested the wetland was generally of this origin, although there was significant conflicting classification results between the four datasets

Stormwater treatment ponds	High	Spatial overlay analysis suggested the wetland was generally of this origin, with consistent classification results between the four datasets		
	Moderate	Spatial overlay analysis suggested the wetland was generally of this origin, with only minor conflicting classification results between the four datasets		
	Low	Spatial overlay analysis suggested the wetland was generally of this origin, although there was significant conflicting classification results between the four datasets		
Artificial (type unknown)	High	Feature occurs in Wetland 2013 only i.e. not in Wetland 1788, while other spatial overlay analysis does not provide a definitive classification of origin OR Spatial overlay analysis suggested the wetland was generally of this origin, with consistent classification results between the four datasets		
	Moderate	Spatial overlay analysis suggested the wetland was generally of this origin (artificial but type unknown), with only minor conflicting classification results between the four datasets		
	Low	Size of the Wetland 2013 feature >40% more than the size of corresponding Wetland 1788 feature, while other spatial overlay analysis does not provide a definitive classification of origin		
Unknown	n/a	Wetland does not overlap with any of the five datasets		

The 'Dam / Storage features' were subsequently classified into those that were less than or greater than 8 hectares, to distinguish between what are likely to be 'farm dams' vs. 'water storages over eight hectares'.

Acknowledgement

Attachment A: Relevant attribute information in independent data sources

Dataset name	Relevant attribute	Feature type		Likely wetland origin
Wetland 1994	Class	20 - Sewage treatment pond		Sewage treatment pond
All Victorian Dam Boundaries	Feature_type	Aquaculture area	e.g. fish hatcheries	Aquaculture ponds
		Industrial storage	Dams intersecting industrial or mining land uses	Excavation ponds OR Dam / Storage
		Rural irrigation storage	Dams intersecting irrigated land uses	Farm dams OR Dam / Storage
		Settling ponds	Ponds used for water treatment	Sewage treatment ponds
		Town rural storage	Named storages and storages > 250ML	Dam / Storage
		Waste water	Not described	Sewage treatment ponds
		Flood irrigation storage	Dams used to harvest stormwater runoff	Stormwater treatment ponds
		Rural licensed storage	Dams that are likely to be linked to licences	Dam / Storage
		Rural storage	Likely to be stock and domestic dams	Dam / Storage
DRWaterbodies	Desc	Bio-retention system	No description	Stormwater treatment ponds
		Sediment trap	No description	Naturally occurring
		Natural body of water	No description	Stormwater treatment ponds
		Wetlands	No description	Stormwater treatment ponds
Water area 1:25,000	Origin	1	Natural	Naturally occurring
		2	Man-made	Artificial

Water area 1:25,000	Ftype_code	wb_lake	Lake/dam	No data
		wb_lake_salt	Salt lake	Salt works
		Waterbody	Waterbody	No data
		wb_void	Waterbody void (island)	No data
		flat_sti	Area subject to inundation	No data
		pondage	Pondage	No data
		pondage_saltpan	Salt pan / evaporator	Salt works
		pondage_sewage	Sewage filtration beds	Sewage treatment ponds
		wetland_swamp	Swamp	Naturally occurring
		wetland_mangrove	Mangroves	Naturally occurring
		watercourse_area	Not described	Naturally occurring
		watercourse_area_river	Watercourse area	Naturally occurring
		watercourse_area_channel	Large man-made channel	No data
		watercourse_area_drain	Large man-made drain	No data
Water area 1:25,000	Wtr_use_fn	1	Water Supply	Farm dams OR Dam / Storage
		2	Flood Control	No data
		3	Salt Evaporation	Salt works
		4	Sewage	Sewage treatment ponds
		5	Tailing Dam	Excavation ponds
		6	Cooling Ponds	No data
		7	Drainage	No data
		8	Irrigation	Farm dams OR Dam / Storage
		9	Recreation	Dam / Storage
Features of interest	Feature_subtype	Abandoned quarry	No description	Excavation ponds
		Landfill	No description	Excavation ponds
		Mine	No description	Excavation ponds
		Quarry	No description	Excavation ponds