

DETAILED MAPPING OF THE DUCK RIVER CATCHMENT

Prepared for Parramatta City Council

By Applied Ecology Pty Ltd



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DOCUMENT VERIFICATION

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Document Title	PRELIMINARY ASSESSMENT OF THE DUCK RIVER CATCHMENT WATERWAYS
Client	Parramatta City Council
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Vector images (used in cross sections) courtesy of the Integration and Application Network, University of Maryland Center for Environmental Science (ian.umces.edu/symbols/)

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DETAILED MAPPING OF DUCK RIVER CATCHMENT

METHODOLOGY

The first stage in the detailed mapping process was to divide each stream into reaches. Determination of reaches and sample points was conducted using the following steps:

1. **Division of longitudinal continuity:** Individual reaches were identified as being longitudinally bounded by a confluence or termination of the stream.
2. **Division of different land use:** Changes in land use between bushland, urban areas and sporting fields/parks were used to further sub-divide the reaches. Land surface composition, in particular, area of impervious surfaces can greatly impact the quality and quantity of stormwater and thus affects stream condition.
3. **Division by buffer width:** For bushland and parkland stretches, the reaches were further divided according to width of riparian buffer (distance of vegetated zone before urban development). A substantive riparian buffer is in effect a “biophysical highway;” it provides effective filtration by trapping sediments and nutrients, attenuates flood impacts and provides habitat and wildlife corridors. Presence of headwalls, culverts and other infrastructure were used to further subdivide reaches.

Reach watershed profiles were created and used to build an ecological profile for each identified reach, including:

- a) contours;
- b) physical features/structures, barriers;
- c) stormwater outlets, including piped and open channel drainage within the catchment (location, impact, litter loads, scour etc);
- d) comparative land use, with typical cross-sections for each reach;
- e) geomorphic features (bank type, pools, erosion points, deposition zones, bed material etc);
- f) stream behaviour and processing zones, existing bank structure/works, floodplain limits;
- g) vegetation associations, aquatic flora and fauna, level of weed infestation, significant snags, vegetation blockages;
- h) other information considered necessary (eg contaminated sites such as landfill sites and asbestos contamination, existing gross pollutant traps and weirs, existing volunteer and contract bush regeneration sites, cadastre maps and aerial photos, service facilities such as sewerage, power, gas and water, and evidence of encroachment/dumping)

This data will underpin the development of the prioritised works plan and maintenance plan, and draws largely on the Australian Streambank Rehabilitation Manual Vols 1 & 2 (Rutherford et al, 1999).

THE CATCHMENT

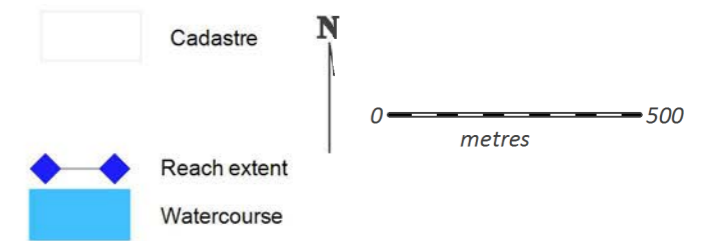
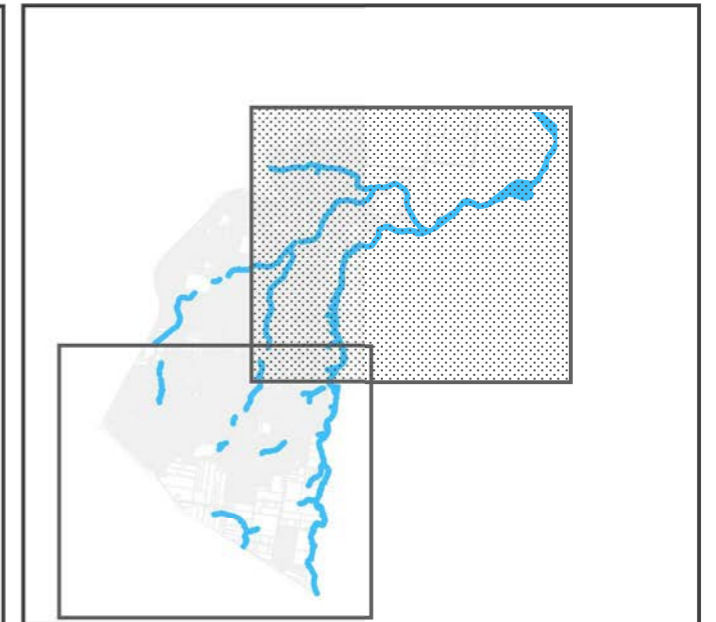
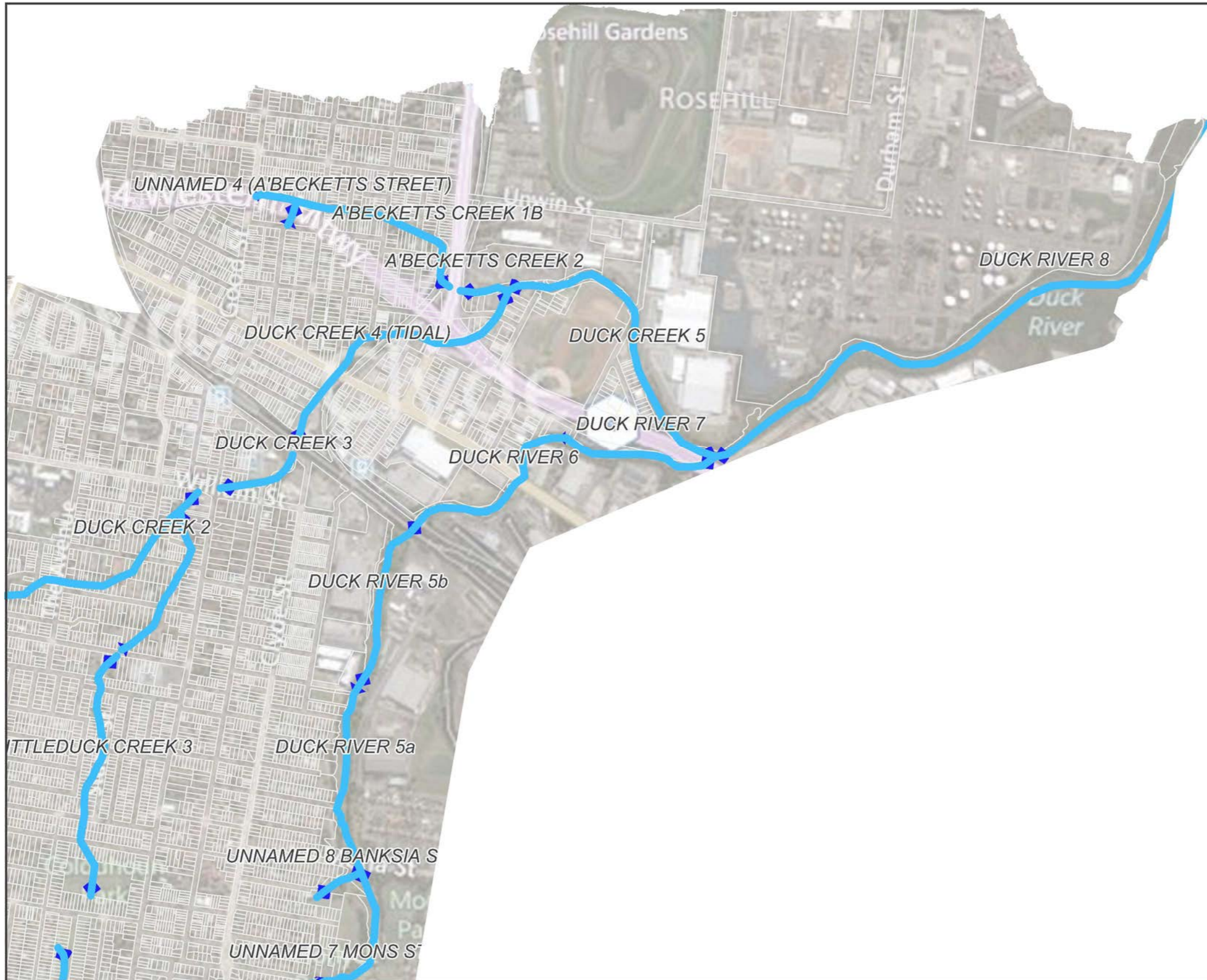
OVERVIEW OF MAPPING

All maps were prepared using MapInfo v11. All products are in .tab format **Projection: MGA56 Datum: GDA94**

The following maps were prepared from database reviews and field survey data:

	MAP NAME	MAPSHEETS#	DESCRIPTION	DATA SOURCE
1	REACH OVERVIEW DUCK RIVER CATCHMENT PARRAMATTA LGA	2	Watercourses were divided into reaches. These sheets provide an overview of the location of these reaches within the Duck River catchment	Cadastre-PCC Watercourses-PCC AP-Microsoft terra server Map server
2	ELEVATION MODEL (2M CONTOUR) DUCK RIVER CATCHMENT PARRAMATTA LGA	1	Elevation model (2m contours) for Duck River Catchment	Contour_2 - PCC
3	CHANNEL ATTRIBUTES DUCK RIVER CATCHMENT PARRAMATTA LGA	2	Observed erosion/deposition features reach overview	Field observations Cadastre-PCC Watercourses-PCC
4	CHANNEL PROCESSES DUCK RIVER CATCHMENT PARRAMATTA LGA	2	Observed processes reach overview	Field observations Cadastre-PCC Watercourses-PCC
5	CROSS SECTIONS	12	Typical reach cross sections for the key reach types within the catchment	Tidal reaches: SMCMA: DR_XpRafts_SubCats Non-tidal reaches: field work Vector images (used in cross sections) courtesy of the Integration and Application Network, University of Maryland Center for Environmental Science (ian.umces.edu/symbols/)
6	PIPE NETWORK, GPTS AND WEIRS- DUCK RIVER CATCHMENT PARRAMATTA LGA	3	Pipe network and outlets to watercourses and any stormwater improvement devices noted and any other obstructions noted. This data is potentially incomplete due to the concealed nature of many GPTs (such as CDS units)	Field observations Cadastre-PCC Watercourses-PCC Pipe network-PCC
7	VEGETATION COMMUNITIES DUCK RIVER CATCHMENT PARRAMATTA LGA	3	Vegetation communities are represented by polygons.	Cadastre-PCC Watercourses-PCC Vegetation (Draft) : SMCMA
8	BUSHCARE/CONTRACT WORK SITES DUCK RIVER MAIN CHANNEL PARRAMATTA LGA	3	Bushcare and contract work sites as polygons overlaid on extant vegetation to provide context of current and past works (2008-)	Conversion of hard data provided by PCC Cadastre-PCC Watercourses-PCC Vegetation (Draft) : SMCMA
9	LAND USE DUCK RIVER CATCHMENT PARRAMATTA LGA	3	Key land use categories for each minor subcatchments adjoining open watercourses are represented graphically as % of subcatchment area	Subcatchments: SMCMA: - DR_XpRafts_SubCats Cadastre-PCC Watercourses-PCC
10	AHIMs SEARCH DUCK RIVER CATCHMENT PARRAMATTA LGA	1	AHIMs database search based on lot or DP numbers as per cadastre layer of lots adjoining watercourses + 50 m buffer	Cadastre-PCC Watercourses-PCC
11	HERITAGE ITEMS (EUROPEAN/GENENERAL) DUCK RIVER CATCHMENT PARRAMATTA LGA	3	Lots based maps where lots contain heritage items of local, state or national significance	Heritage-PCC Cadastre-PCC Watercourses-PCC
12	CONTAMINATED SITES DUCK RIVER CATCHMENT PARRAMATTA LGA	1	Sites from NSW Contaminated Land Register, accessed 10 th May, 2012	Cadastre-PCC Watercourses-PCC

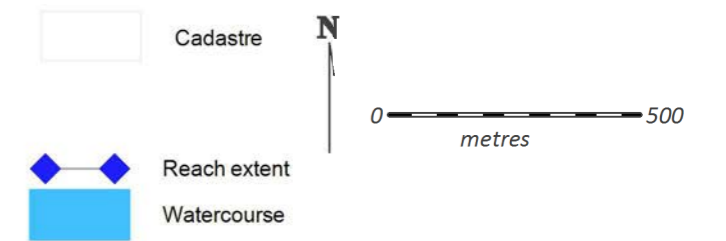
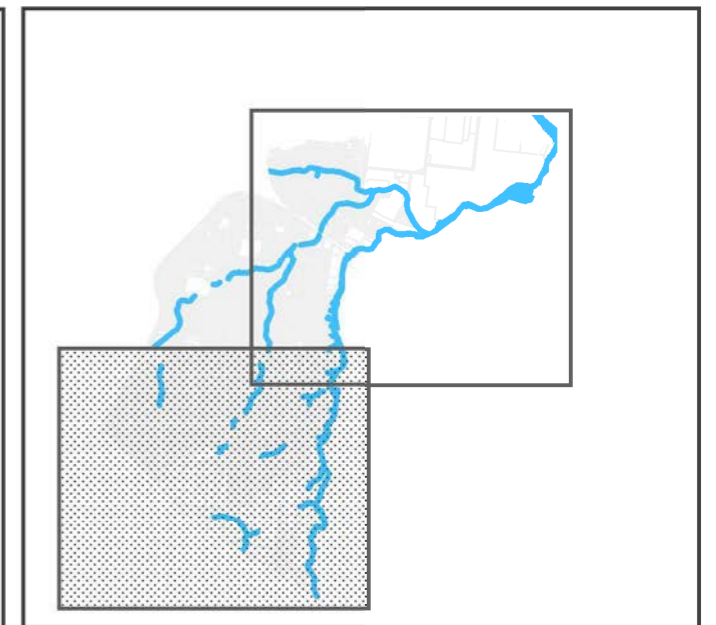
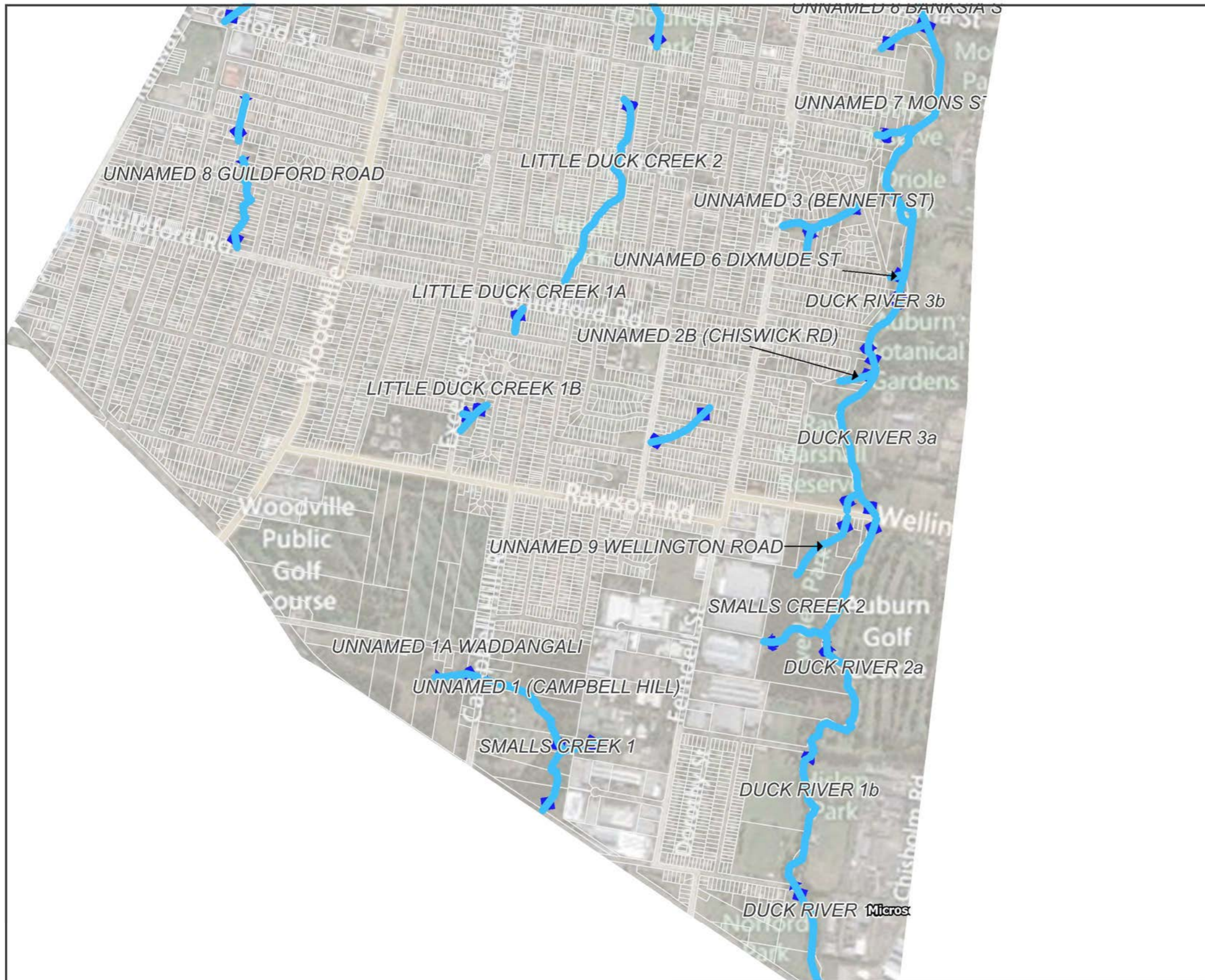
REACH OVERVIEW DUCK RIVER CATCHMENT PARRAMATTA LGA



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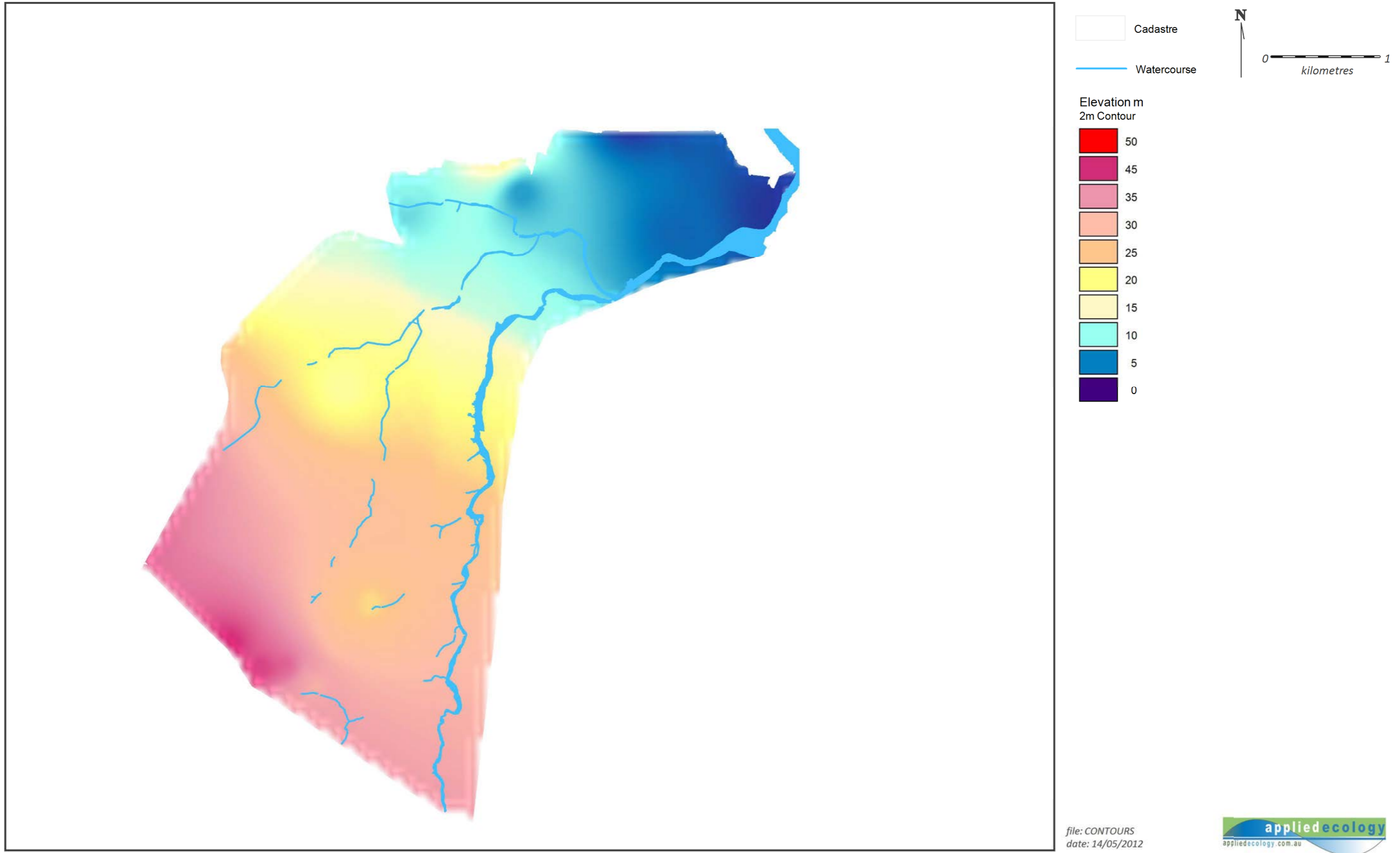
REACH OVERVIEW DUCK RIVER CATCHMENT PARRAMATTA LGA



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date: 17/05/2012



ELEVATION MODEL (2m CONTOUR) DUCK RIVER CATCHMENT PARRAMATTA LGA



STREAM PROCESSING






Geomorphic Features and Stream Behaviour

Reaches of the Duck River, Duck Creek, Little Duck creek and Smalls Creek have been assessed and broadly characterised into dominant stream processing character and channel stability. The assessment process was undertaken via visual inspection and key stream character attributes were:

1. Stream bed and bank stability; and
2. Stream processing zones.

Stream bed and bank stability was assessed visually by walking between 50 and 250m channel segments and assigning appropriate ratings. The rating elements and example photographs are provided in Table 1.

Table 1. Channel form and condition – criteria for allocation and examples

CHANNEL CONDITION	EXAMPLE	CHANNEL CONDITION	EXAMPLE
Concrete Lined Example: Duck Creek 2 (pictured)		Stable: Few or no signs of bed and bank erosion, vegetated floodplain Example: Duck River Reach 4 (Pictured)	
Highly Eroding: Stream is deeply incised, generally earth/rock lined with regular pinch points. Example: Smalls Creek (pictured)		Aggregating. Weirs or impoundments assist in trapping the movement of sediment leading to buildup Example: behind the 'stepping stones' weir (Pictured)	
Moderately Eroding: Stream is incised and contained, regular bank undercutting and evidence of scour Example: Duck River bank erosion in Reach 1 (Pictured)		Tidal: Stream is under tidal influence Example Lower Duck River reaches 4-6	

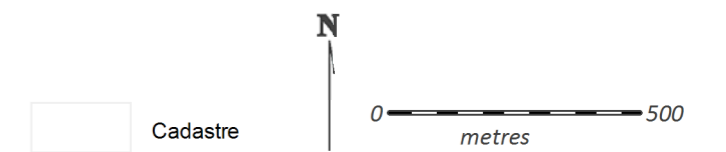
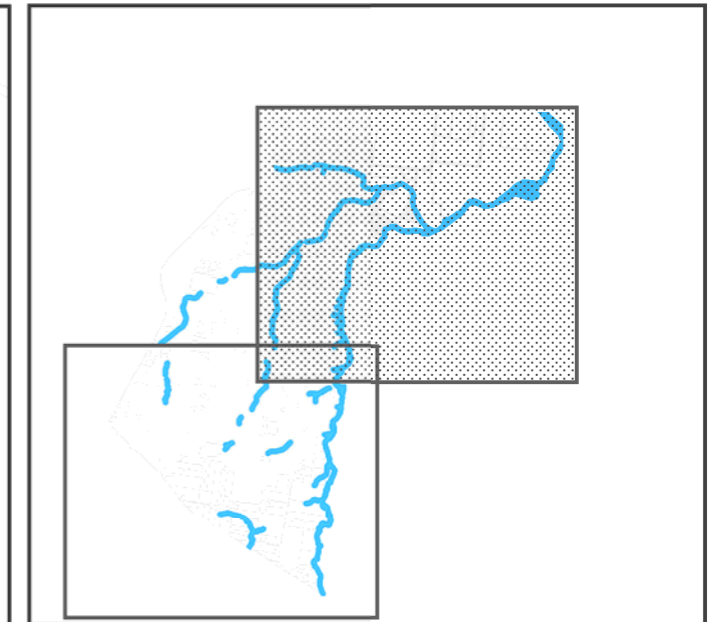
CHANNEL ATTRIBUTES

Results of the hydro-geomorphic assessment are provided in Table 4.

Table 2. Results of hydro-geomorphic assessment of reaches in Duck River catchment

REACH NAME	EROSION RATING	PROCESSING CHARACTERISTICS
A'BECKETTS CREEK 1	Concrete lined	Concrete lined
A'BECKETTS CREEK 2	Tidal/mangrove/aggregating	Tidal
DUCK CREEK 1	Concrete lined	Concrete lined
DUCK CREEK 2	Concrete lined	Concrete lined
DUCK CREEK 2a	Concrete lined	Concrete lined
DUCK CREEK 3	Concrete lined	Concrete lined
DUCK CREEK 4	Tidal/concrete	Tidal/concrete
DUCK CREEK 5	Tidal/mangrove/aggregating	Tidal
DUCK RIVER 1A	Moderately eroding	Riffles/pools
DUCK RIVER 1B	Moderately eroding	Riffles/pools
DUCK RIVER 2A	Moderate/high erosion	Riffles/pools
DUCK RIVER 2B	Moderate/high erosion	Riffles/pools
DUCK RIVER 3A	Moderate/high erosion	Riffles/pools
DUCK RIVER 3B	Moderately eroding	pool
DUCK RIVER 4A	Stable/aggregating	pool/impoundment
DUCK RIVER 4B	Stable	pool
DUCK RIVER 5A	Stable	pool/impoundment
DUCK RIVER 5B	Stable	pool/impoundment
DUCK RIVER 6	Tidal/mangrove/aggregating	Tidal
DUCK RIVER 7	Tidal/mangrove/aggregating	Tidal
DUCK RIVER 8	Tidal/mangrove/aggregating	Tidal
LITTLE DUCK CREEK 1A	Stable/ moderately eroding	ephemeral
LITTLE DUCK CREEK 1B	Stable	vegetated/ephemeral
LITTLE DUCK CREEK 2	Stable/ moderately eroding	riffles/glide
LITTLE DUCK CREEK 3	concrete lined	Concrete lined
LITTLE DUCK CREEK 4	Concrete Lined	Concrete lined
SMALLS CREEK 1	Stable/ moderately eroding	riffles/glide
SMALLS CREEK 2	Highly eroding	riffles/pools/pinches
UNNAMED 1A WADDANGALI	Stable	ephemeral
UNNAMED 1B CAMPBELL HILL	Stable	vegetated/ephemeral
UNNAMED 2A RANDOLPH ST	Stable/aggregating	vegetated/ephemeral
UNNAMED 2B CHISWICK RD	Moderate/Highly Eroding	pools/pinches
UNNAMED 3 BENNETT RD	Stable	pools/pinch/vegetated
UNNAMED 4 A'BECKETTS ST	concrete lined	concrete lined
UNNAMED 5 DIXMUDE ST	stable	ephemeral
UNNAMED 6 MONS ST	Stable/Moderately eroding	ephemeral
UNNAMED 7 BANKSIA ST	Stable/aggregating	vegetated
UNNAMED 8 GUILDFORD RD	Concrete lined	Concrete lined
UNNAMED 9 WENTWORTH RD	Stable	ephemeral

CHANNEL ATTRIBUTES DUCK RIVER CATCHMENT PARRAMATTA LGA

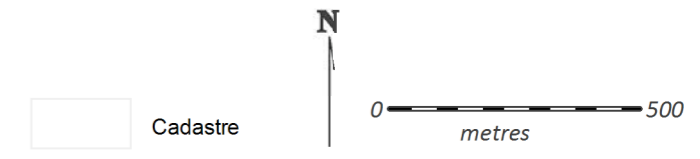
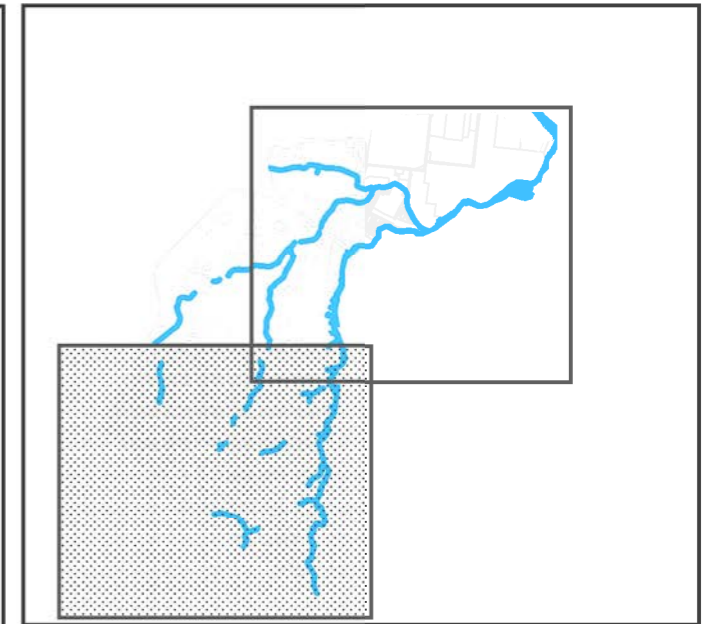


Concrete lined (managed by Sydney Water)	(10)
Highly eroding	(1)
Moderate/high erosion	(3)
Moderate/Highly Eroding	(1)
Moderately eroding	(3)
Stable	(10)
Stable/ moderately eroding	(3)
Stable/aggregating	(3)
Stable/Moderately eroding	(1)
Tidal/concrete	(1)
Tidal/mangrove/aggregating	(5)

file: attributesMP Map 1
date: 17/05/2012



CHANNEL ATTRIBUTES DUCK RIVER CATCHMENT PARRAMATTA LGA



Concrete lined (managed by Sydney Water)	(10)
Highly eroding	(1)
Moderate/high erosion	(3)
Moderate/Highly Eroding	(1)
Moderately eroding	(3)
Stable	(10)
Stable/ moderately eroding	(3)
Stable/aggregating	(3)
Stable/Moderately eroding	(1)
Tidal/concrete	(1)
Tidal/mangrove/aggregating	(5)

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date: 17/05/2012



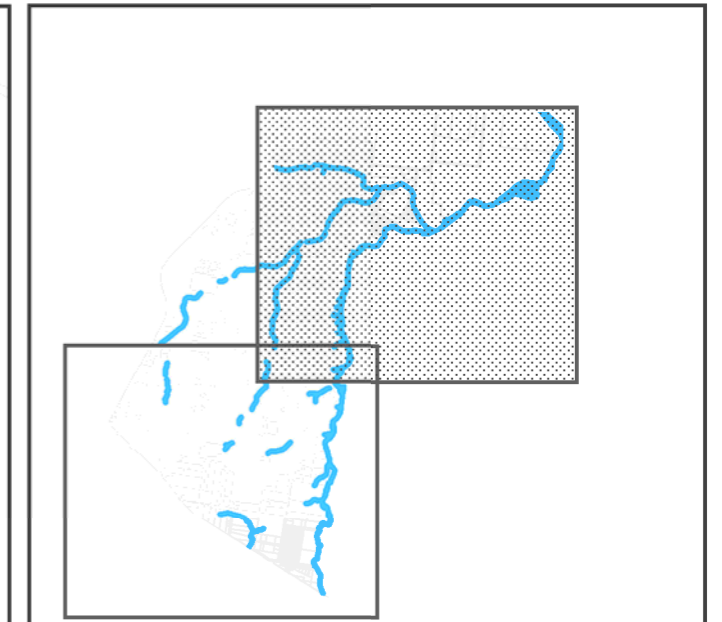
CHANNEL PROCESSES

Results of the hydro-geomorphic assessment are provided in Table 4.

Table 3. Results of hydro-geomorphic assessment of reaches in Duck River catchment

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DUCK CREEK 2a	Concrete lined	Concrete lined
DUCK CREEK 3	Concrete lined	Concrete lined
DUCK CREEK 4	Tidal/concrete	Tidal/concrete
DUCK CREEK 5	Tidal/mangrove/aggregating	Tidal
DUCK RIVER 1A	Moderately eroding	Riffles/pools
DUCK RIVER 1B	Moderately eroding	Riffles/pools
DUCK RIVER 2A	Moderate/high erosion	Riffles/pools
DUCK RIVER 2B	Moderate/high erosion	Riffles/pools
DUCK RIVER 3A	Moderate/high erosion	Riffles/pools
DUCK RIVER 3B	Moderately eroding	pool
DUCK RIVER 4A	Stable/aggregating	pool/impoundment
DUCK RIVER 4B	Stable	pool
DUCK RIVER 5A	Stable	pool/impoundment
DUCK RIVER 5B	Stable	pool/impoundment
DUCK RIVER 6	Tidal/mangrove/aggregating	Tidal
DUCK RIVER 7	Tidal/mangrove/aggregating	Tidal
DUCK RIVER 8	Tidal/mangrove/aggregating	Tidal
LITTLE DUCK CREEK 1A	Stable/ moderately eroding	ephemeral
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LITTLE DUCK CREEK 3	concrete lined	Concrete lined
LITTLE DUCK CREEK 4	Concrete Lined	Concrete lined
SMALLS CREEK 1	Stable/ moderately eroding	riffles/glide
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UNNAMED 7 BANKSIA ST	Stable/aggregating	vegetated
UNNAMED 8 GUILDFORD RD	Concrete lined	Concrete lined
UNNAMED 9 WENTWORTH RD	Stable	ephemeral

CHANNEL PROCESSES DUCK RIVER CATCHMENT PARRAMATTA LGA



Cadastral map legend:

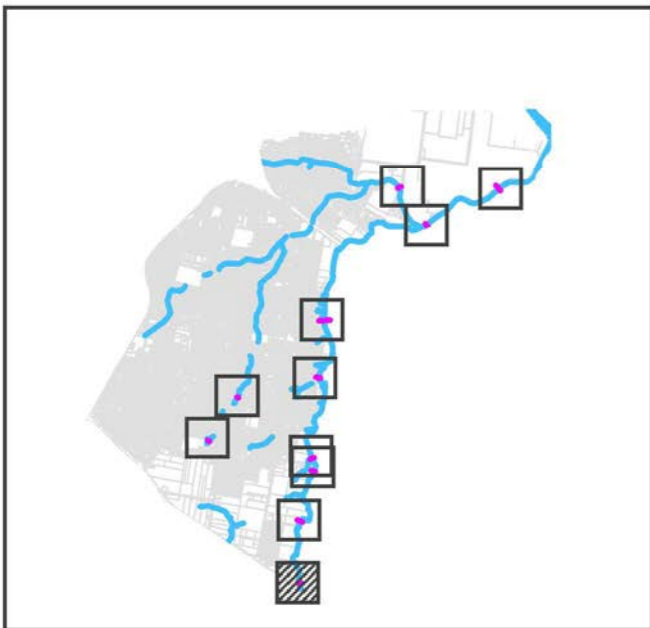
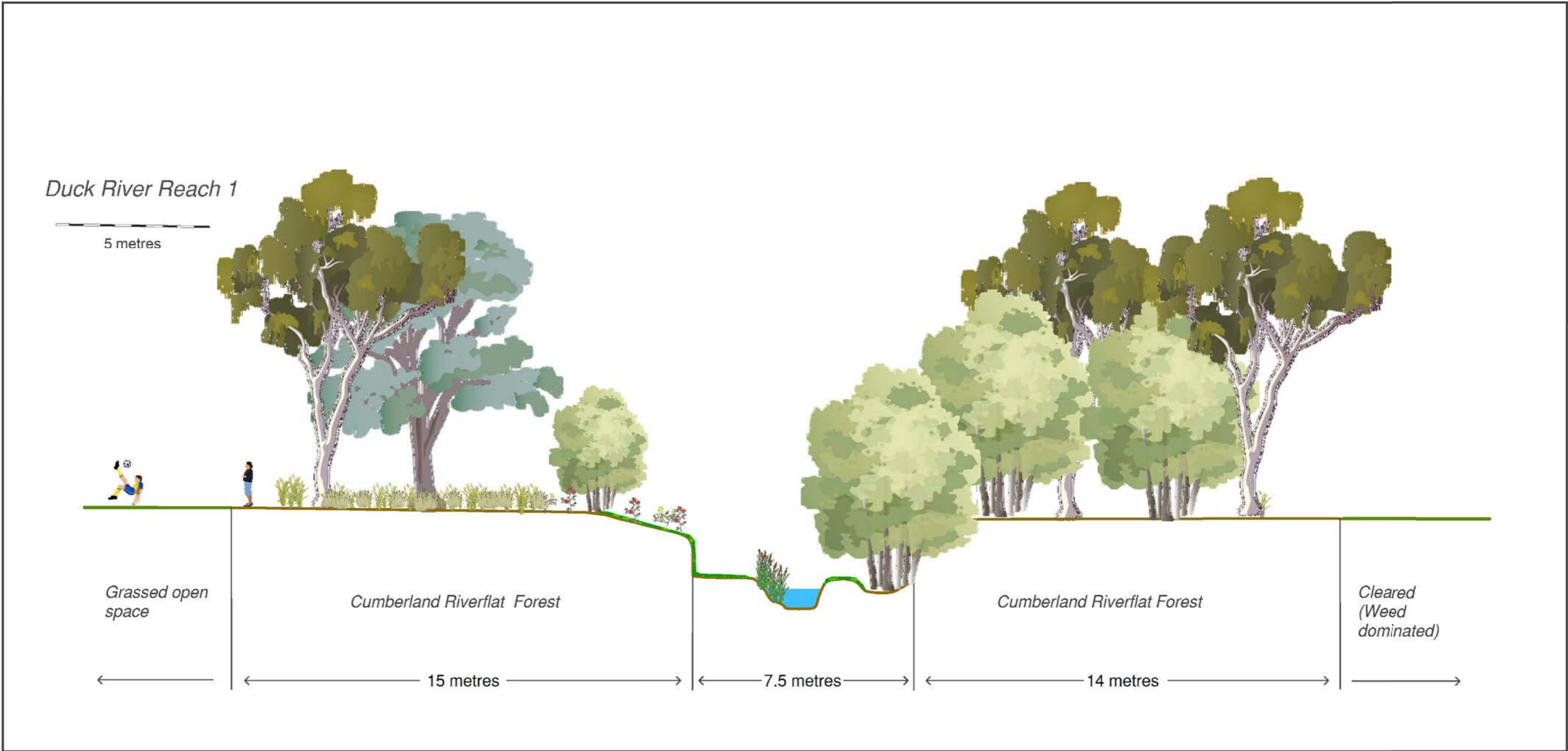
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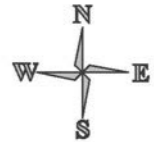
concrete lined	(20)
ephemeral	(12)
pool	(4)
pool/impoundment	(6)
pools/pinch/vegetated	(2)
pools/pinches	(2)
riffles/glide	(4)
riffles/pools	(10)
riffles/pools/pinches	(2)
tidal	(10)
tidal/concrete	(2)
vegetated	(2)
vegetated/ephemeral	(6)

file: processesMP Map 1
date: 17/05/2012



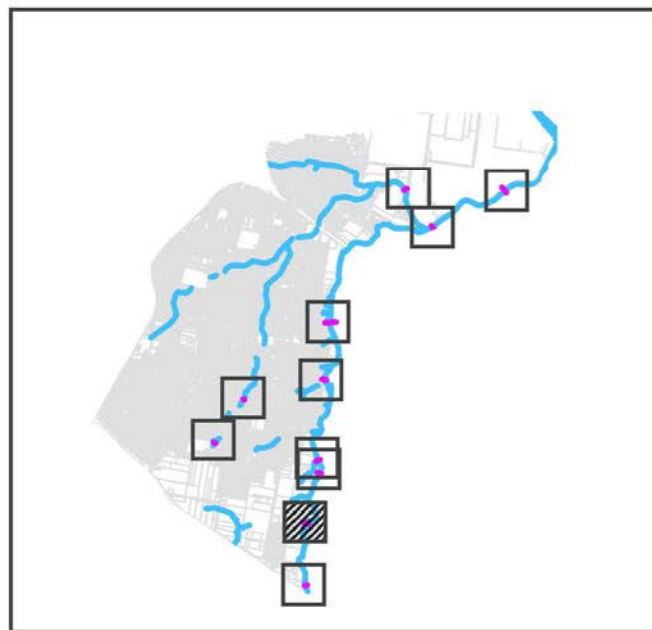
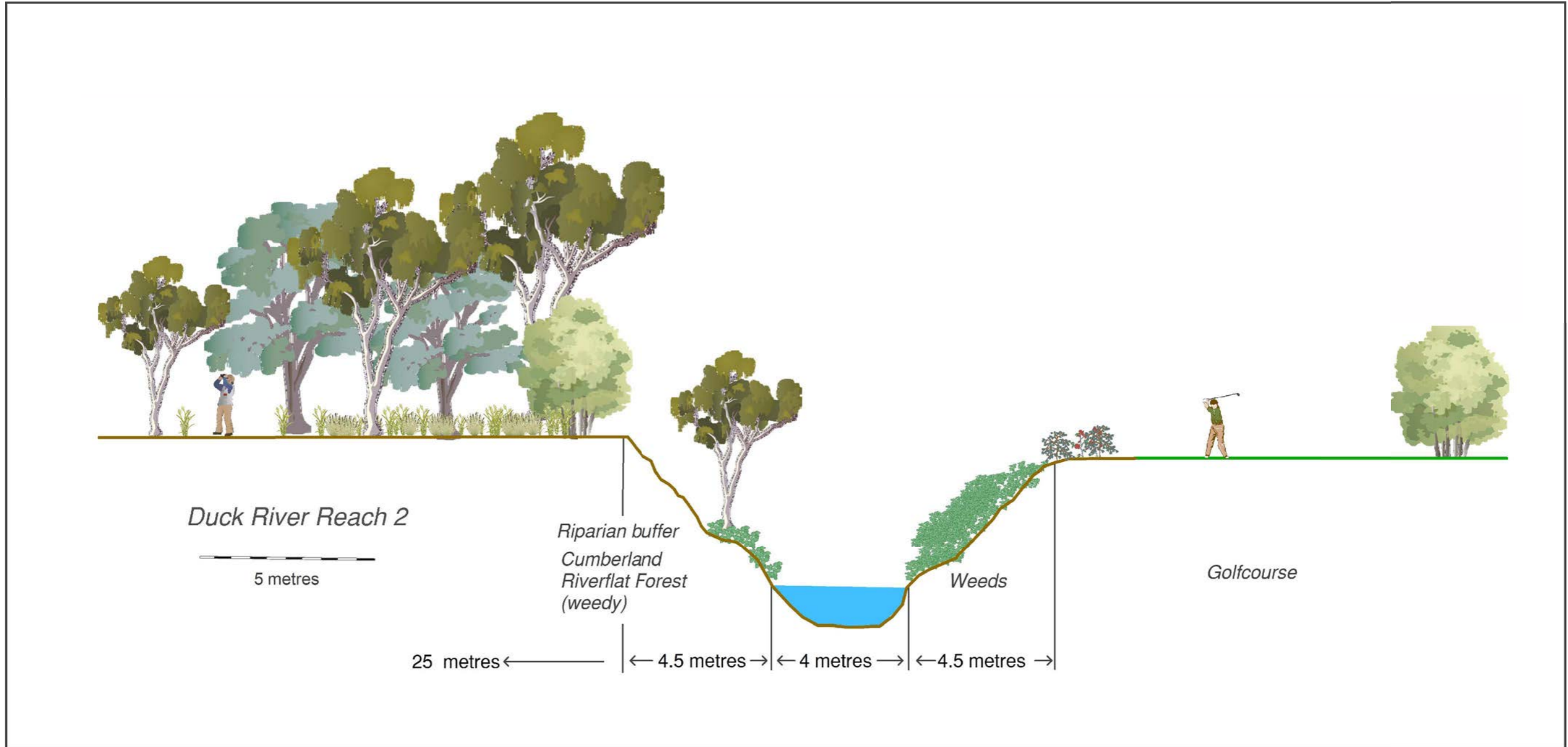


DUCK RIVER REACH 1
CROSS SECTION



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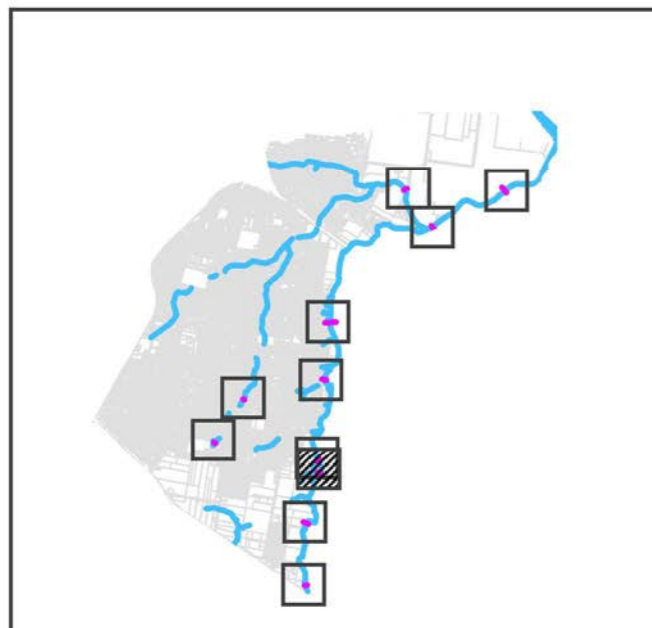
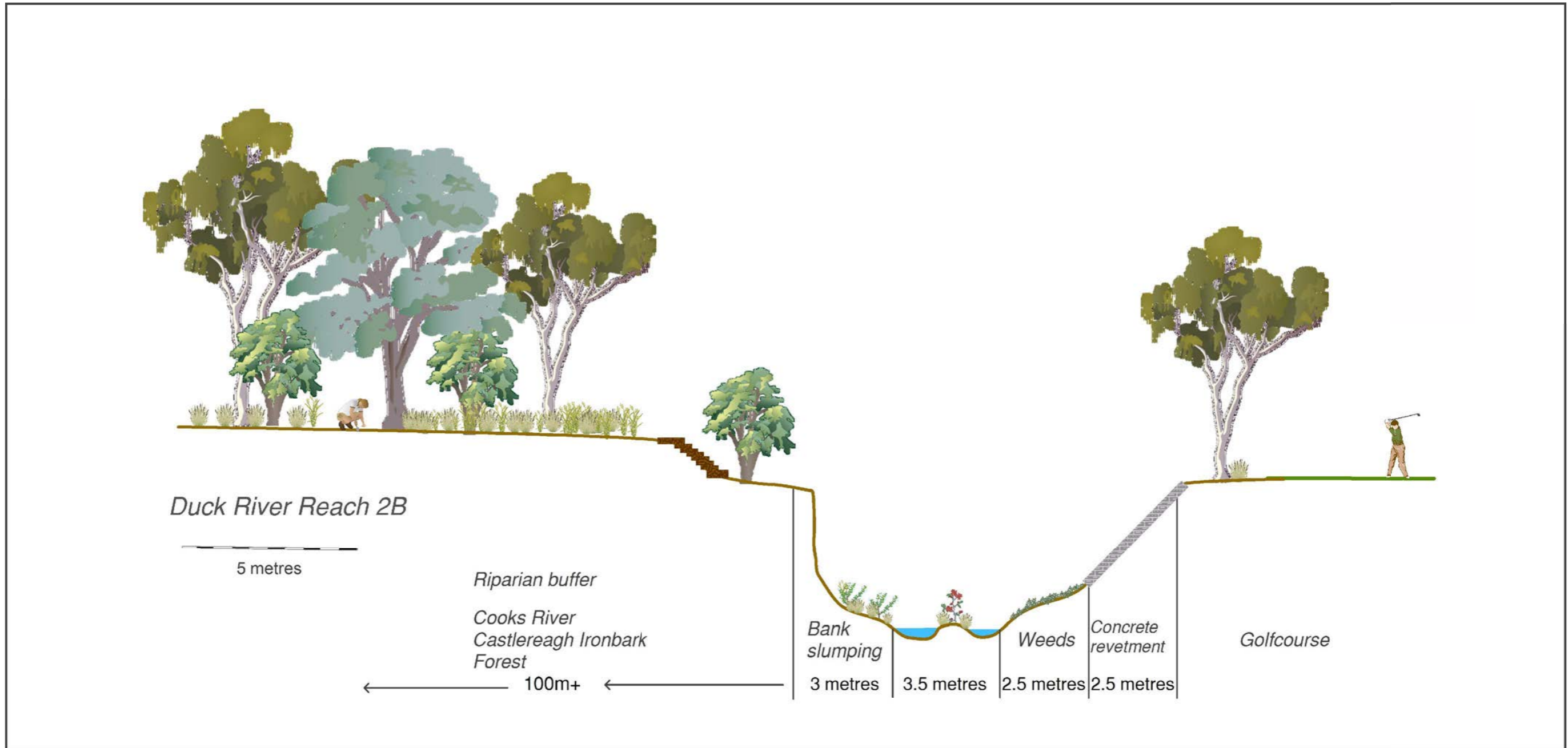


DUCK RIVER REACH 2 (A)
CROSS SECTION



file: bathymetry/crosssections
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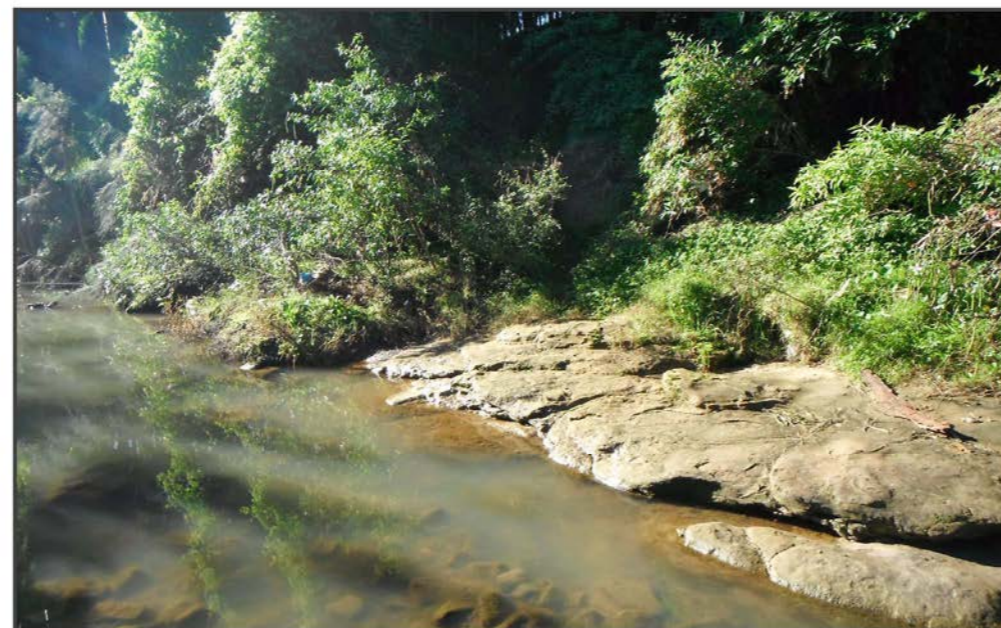
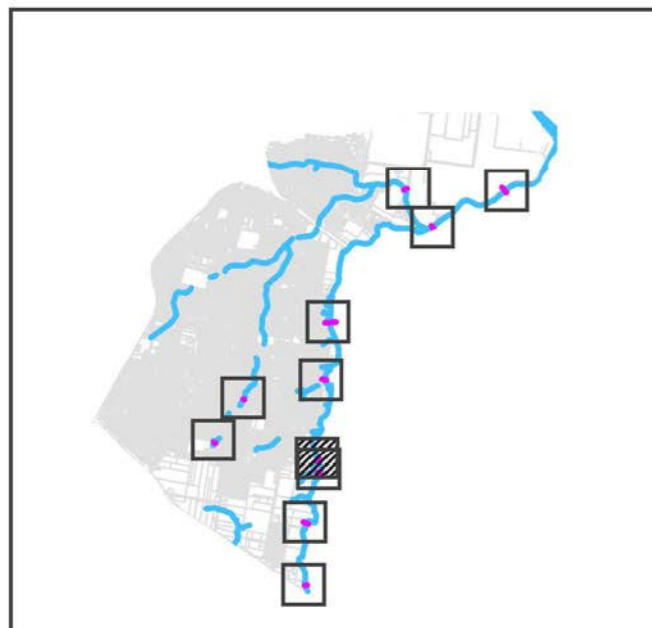
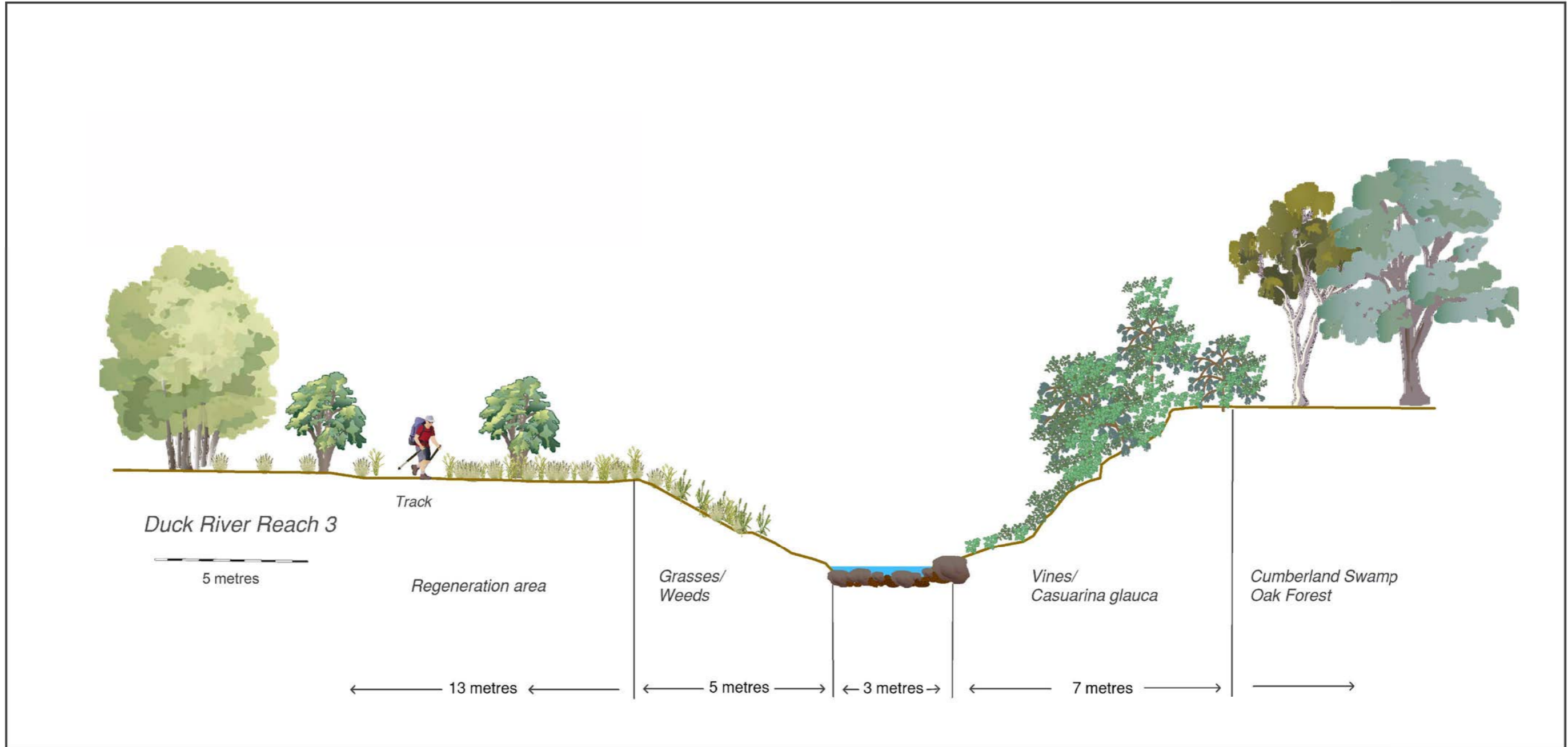


DUCK RIVER REACH 2 (B)
CROSS SECTION



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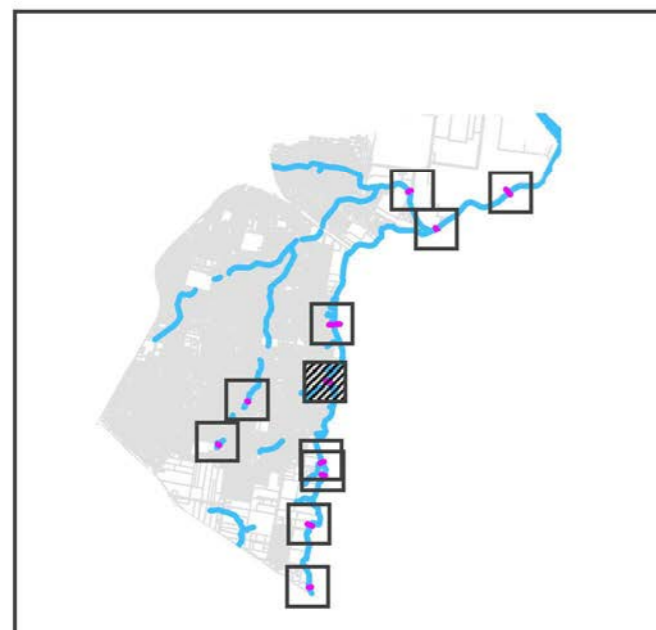
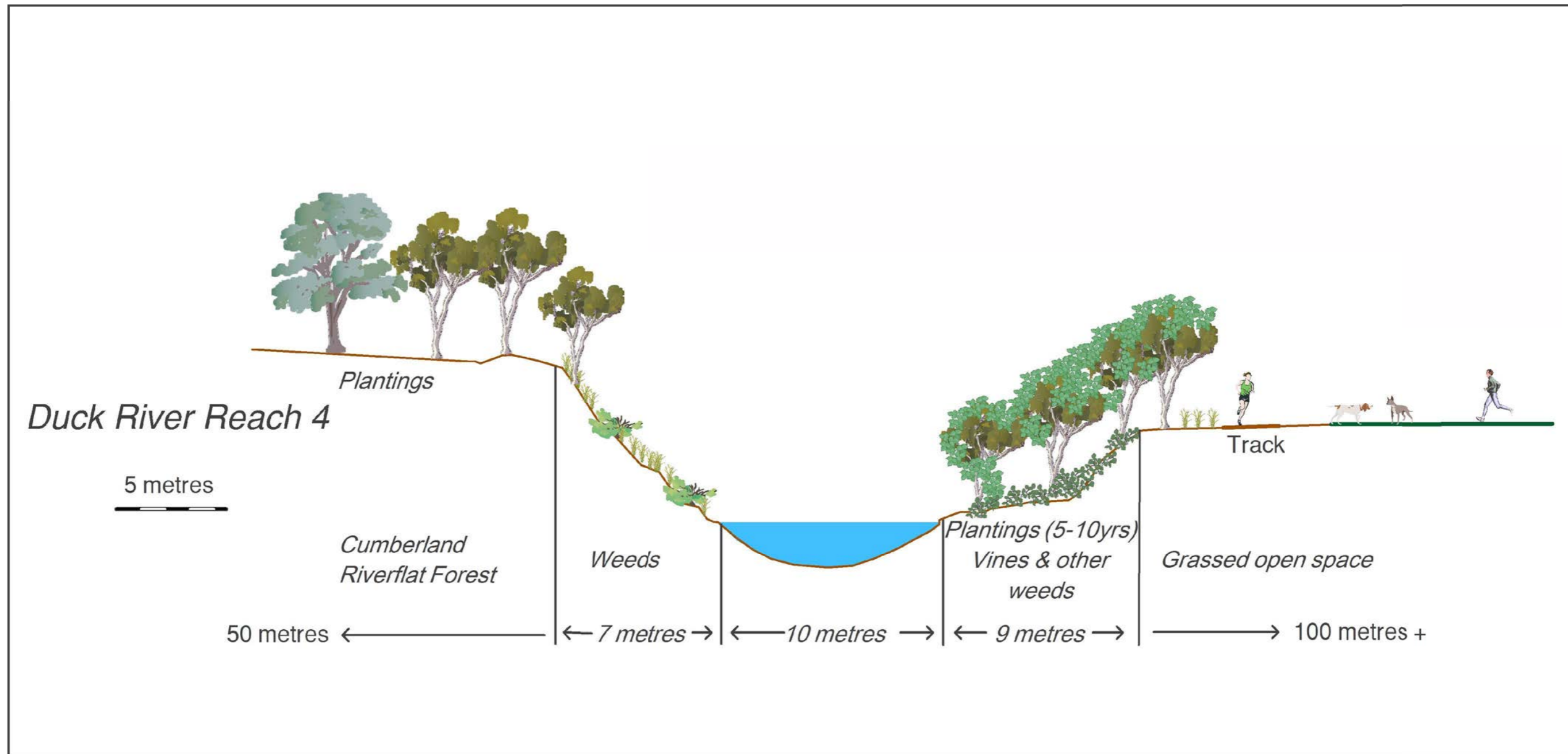


DUCK RIVER REACH 3
CROSS SECTION

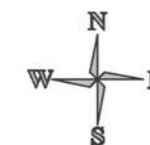


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DUCK RIVER REACH 4
CROSS SECTION


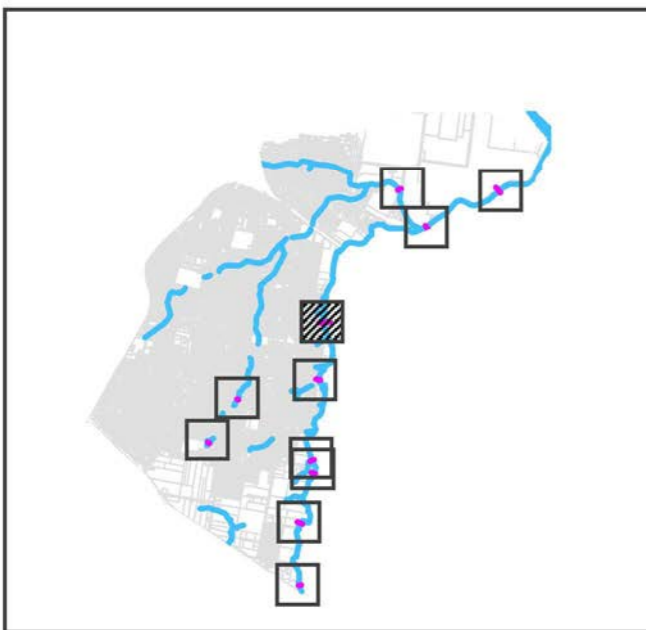
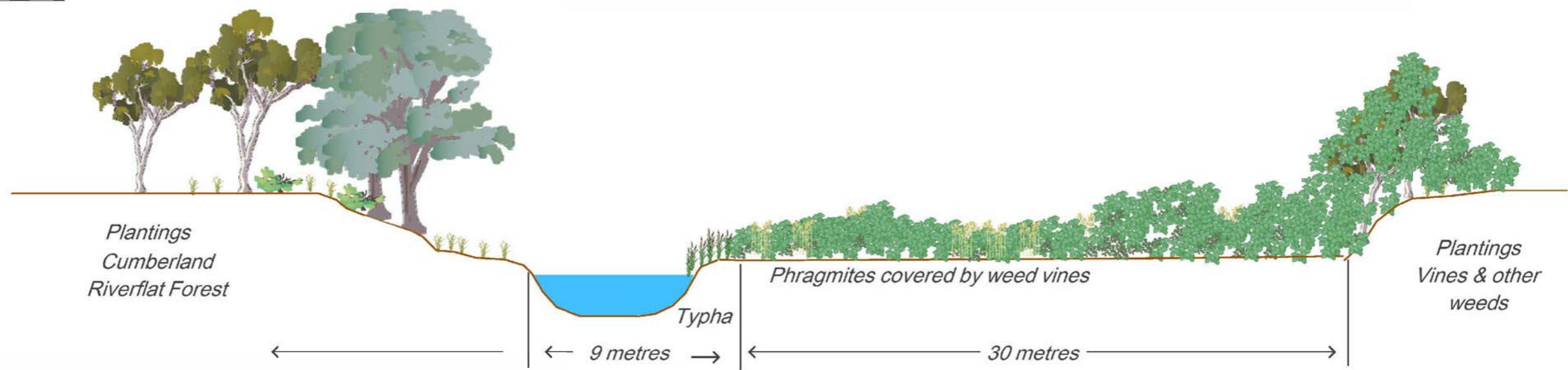


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Duck River Reach 5

5 metres

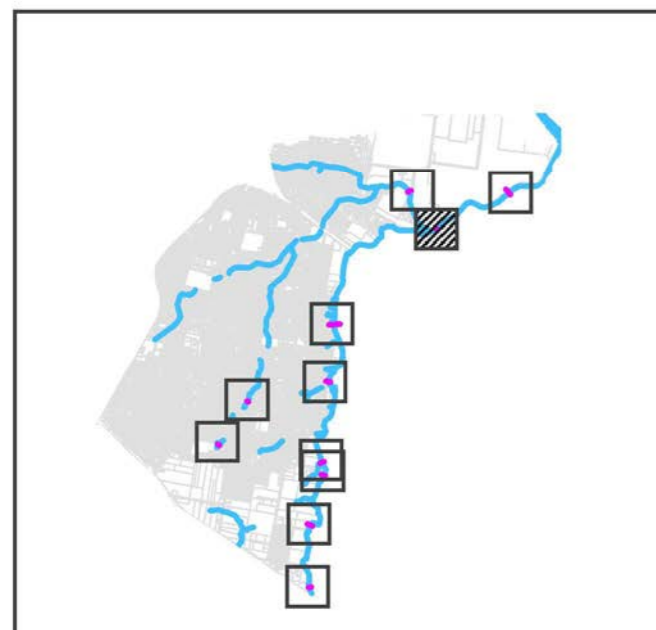
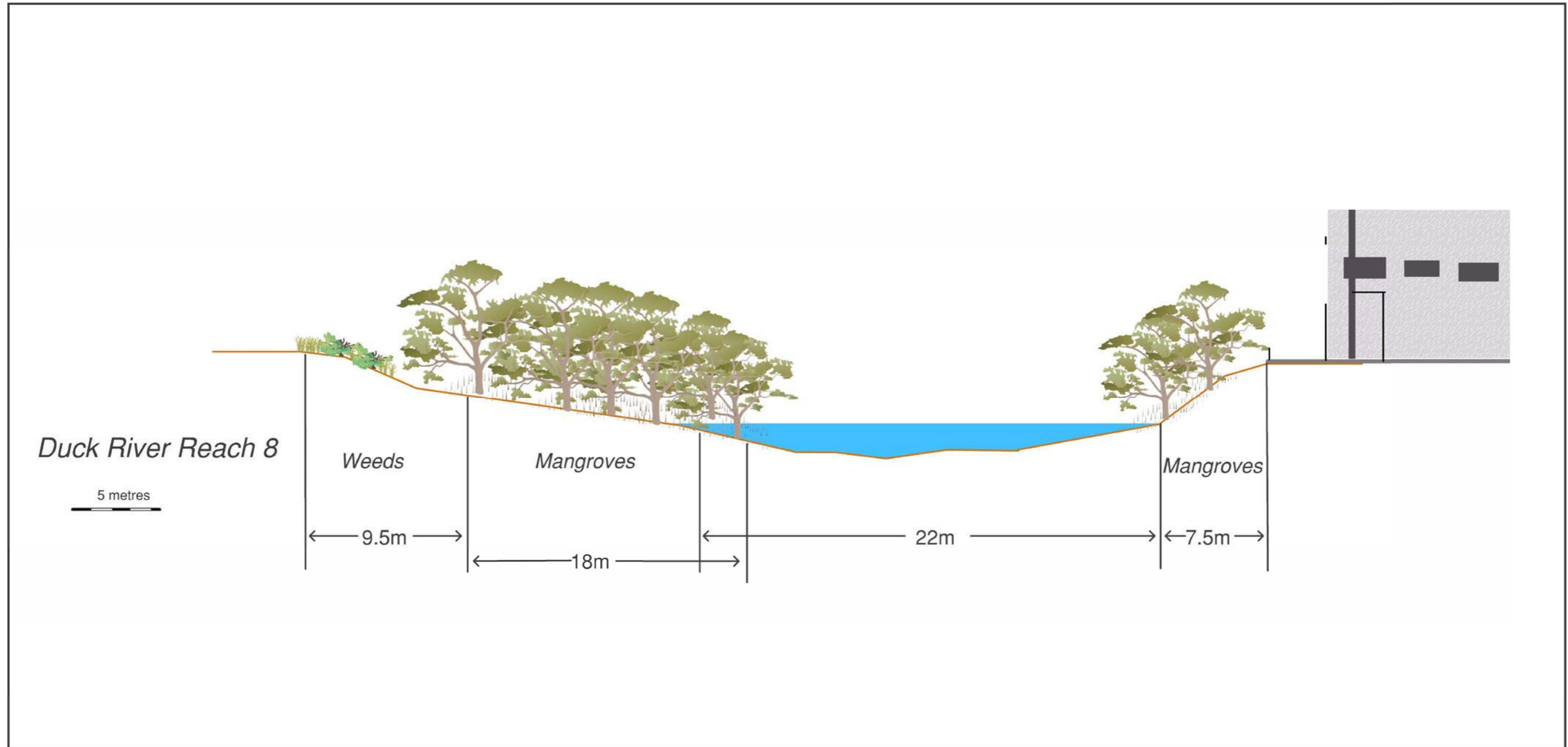
DUCK RIVER REACH 5 CROSS SECTION



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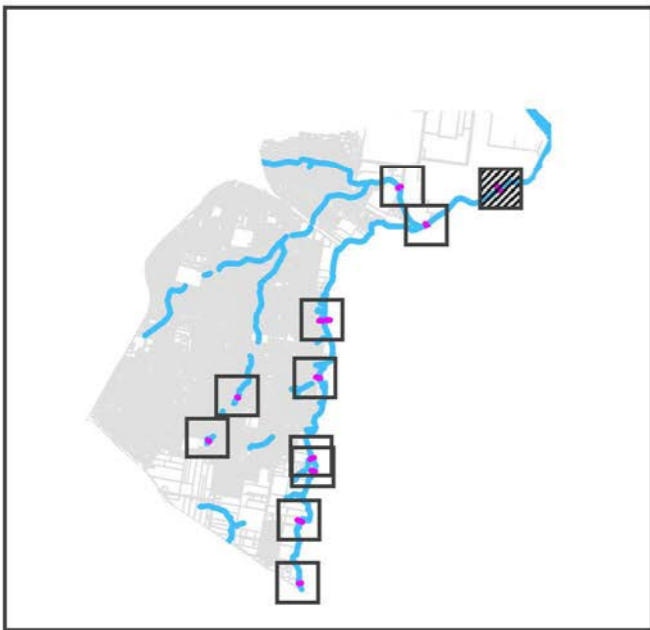
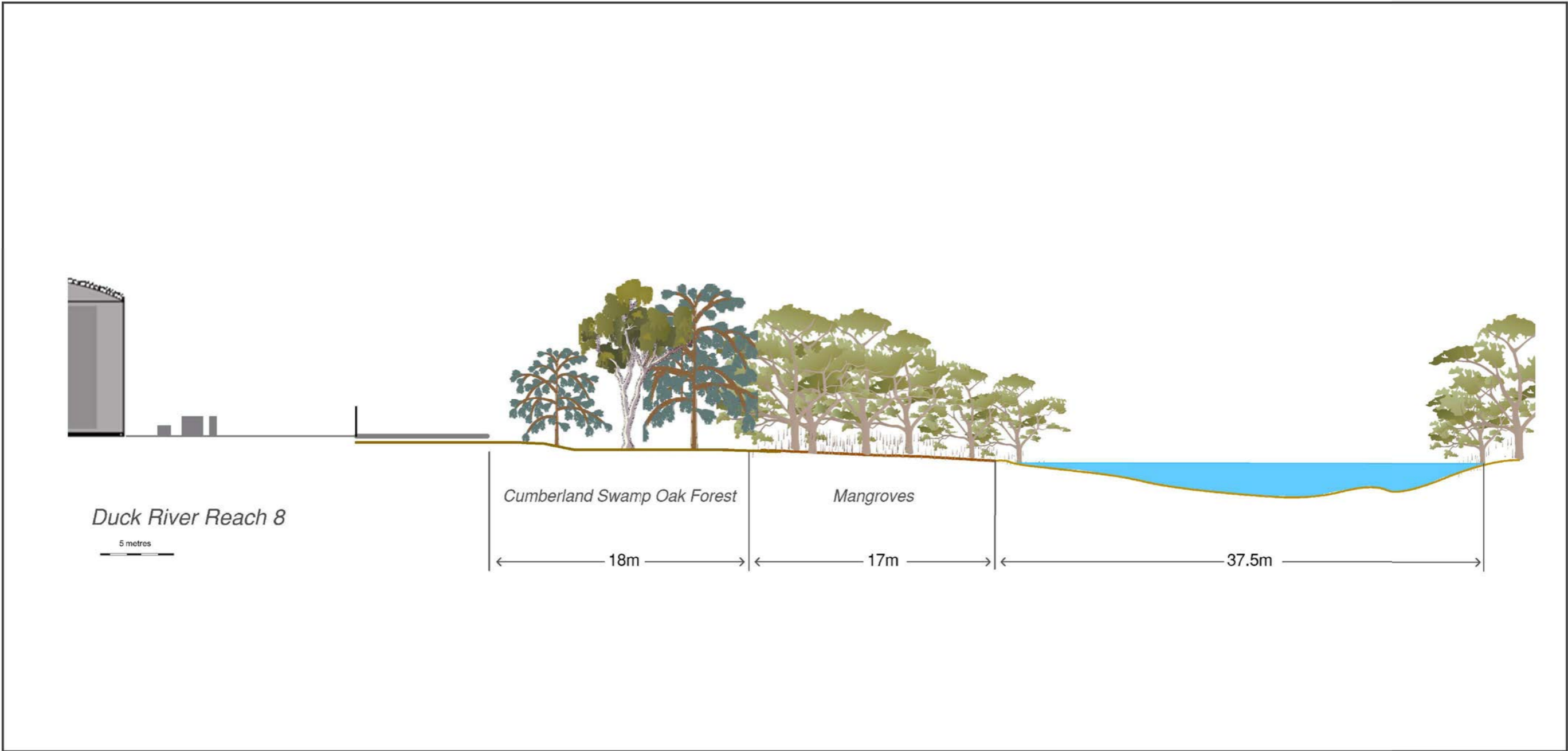


DUCK RIVER REACH 8 (2)
CROSS SECTION

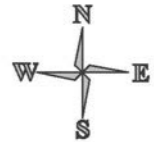


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DUCK RIVER REACH 8 (1)
CROSS SECTION

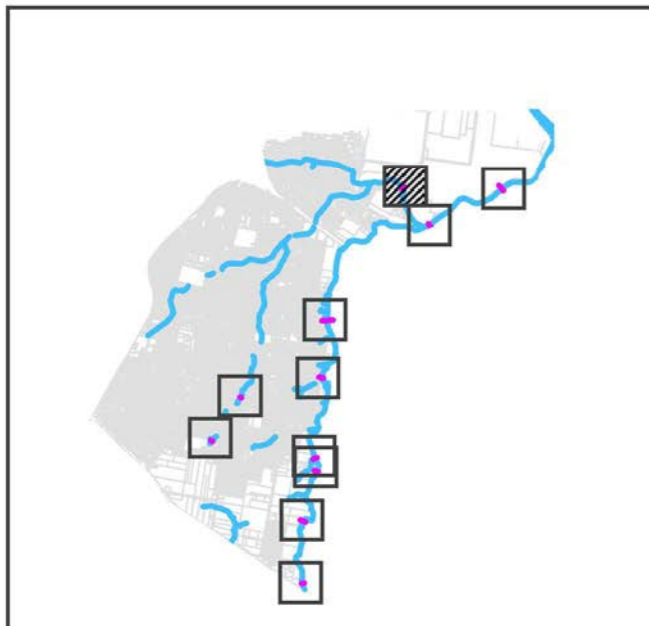
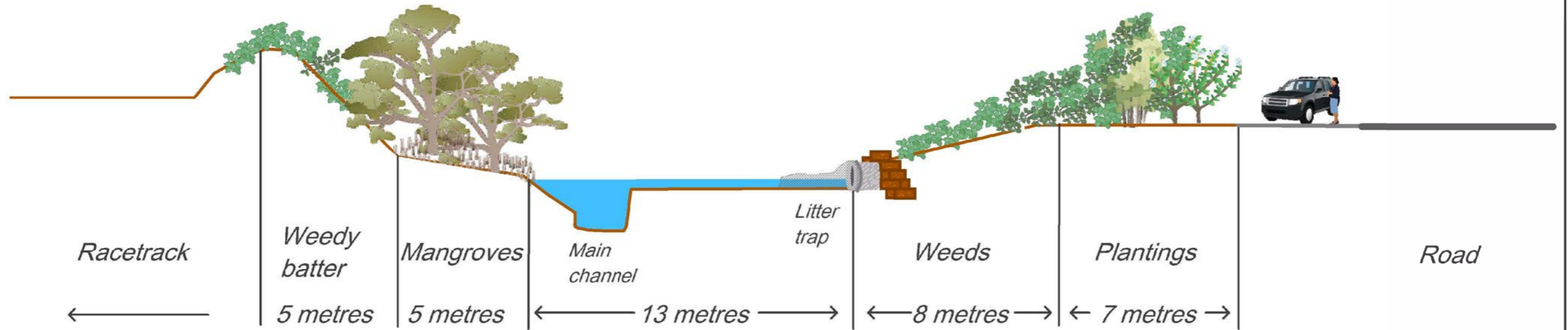


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Duck Creek 5

5 metres



DUCK CREEK 5 CROSS SECTION

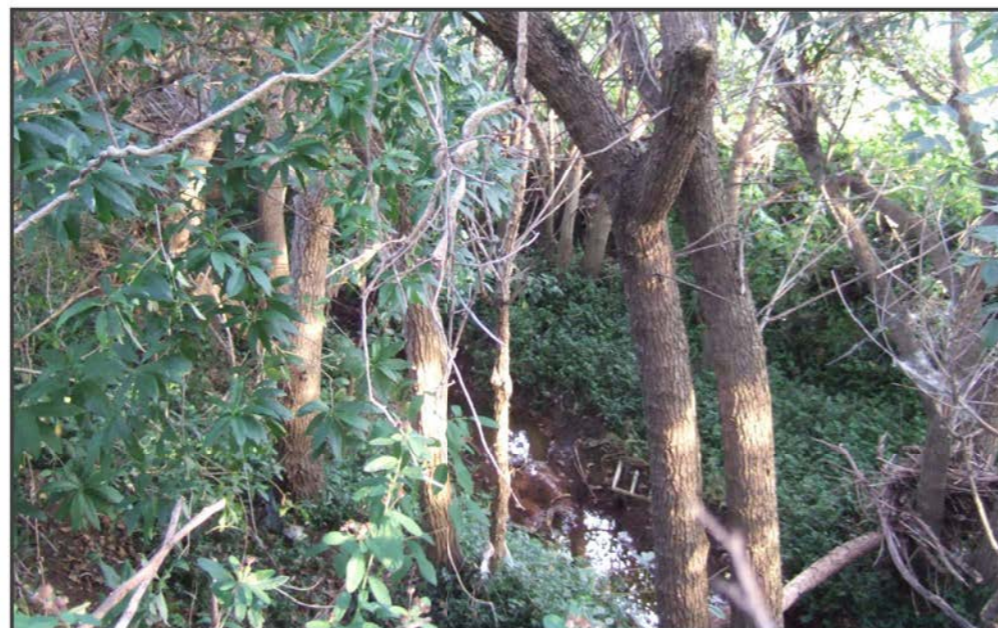
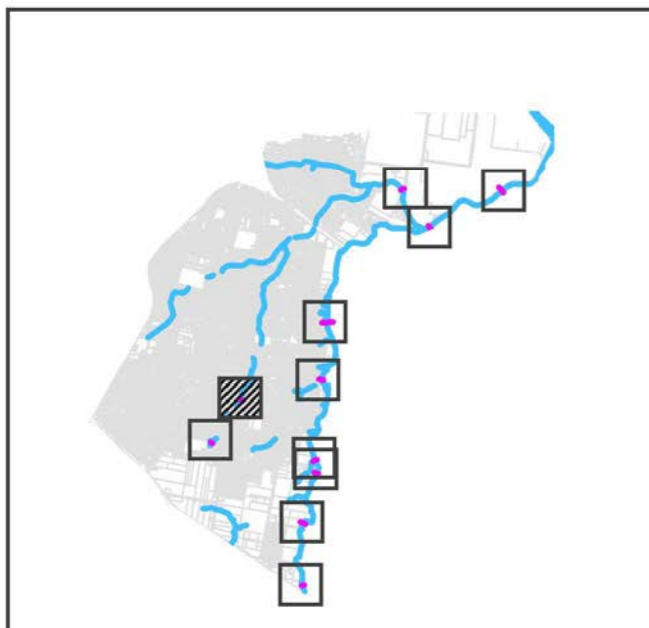
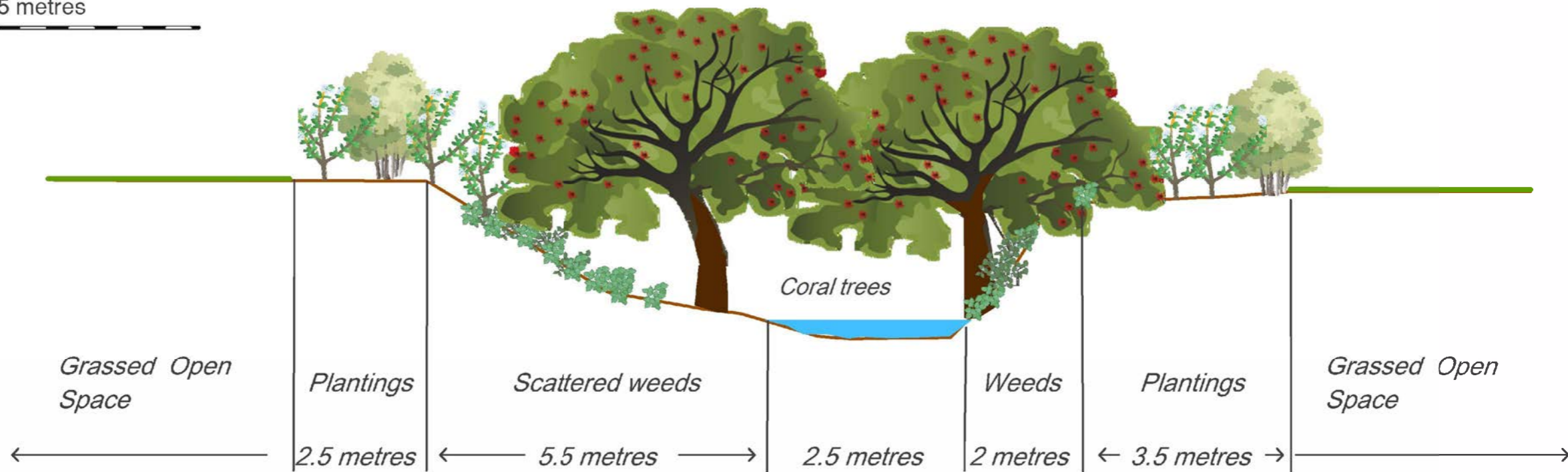


file: bathymetry/crosssections
date: 16/05/2012



Little Duck Creek 2

5 metres



LITTLE DUCK CREEK 2
CROSS SECTION

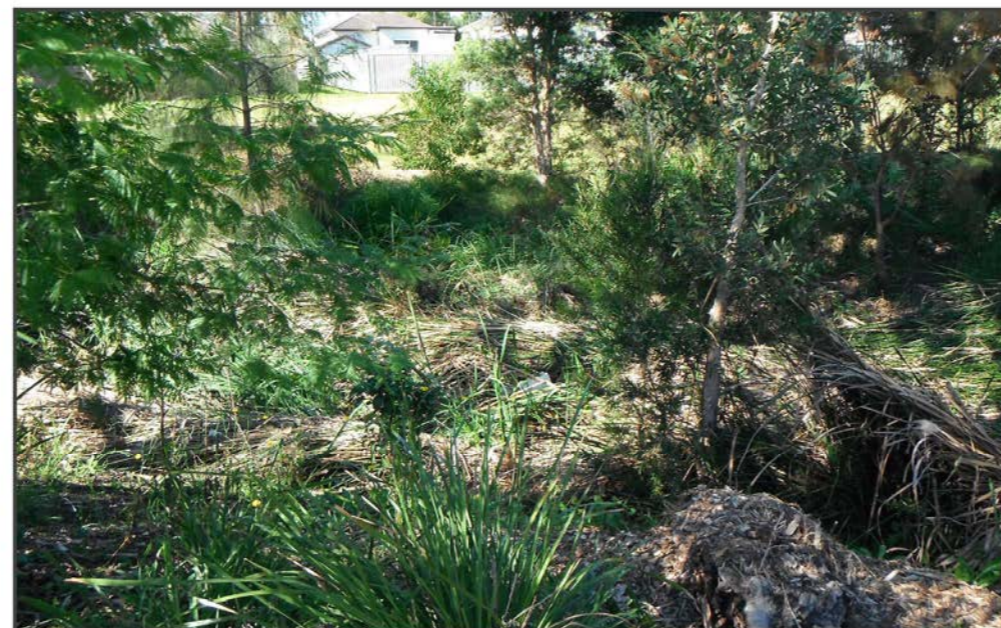
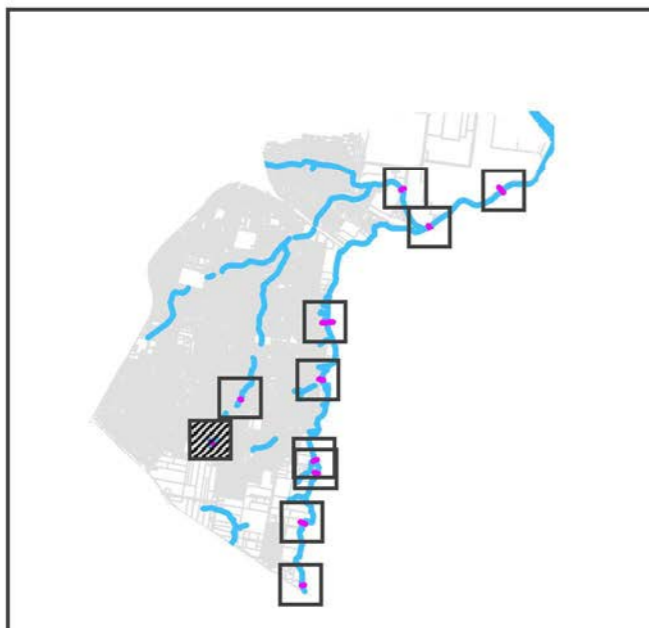
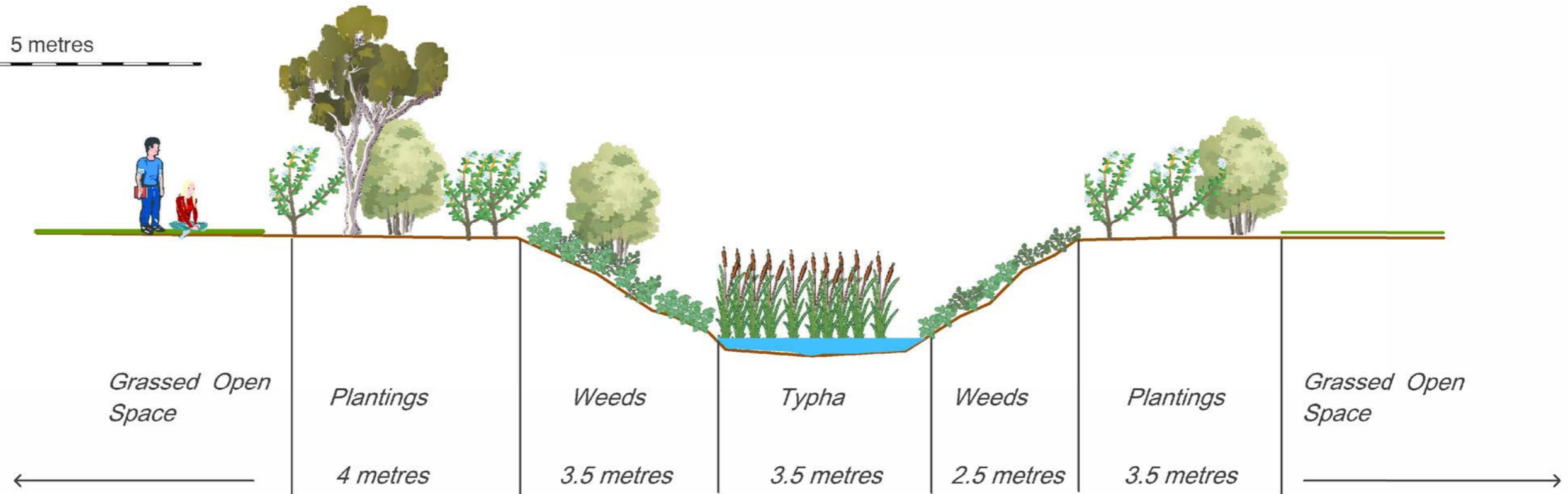


file: bathymetry/crosssections
date: 16/05/2012

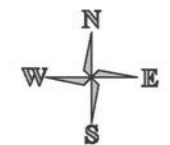


Little Duck Creek 1B

5 metres



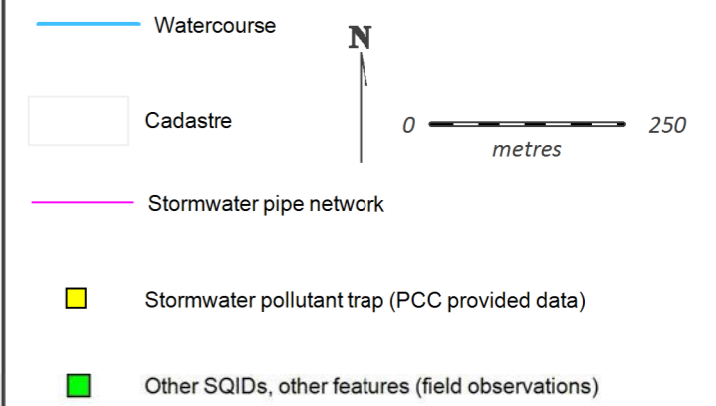
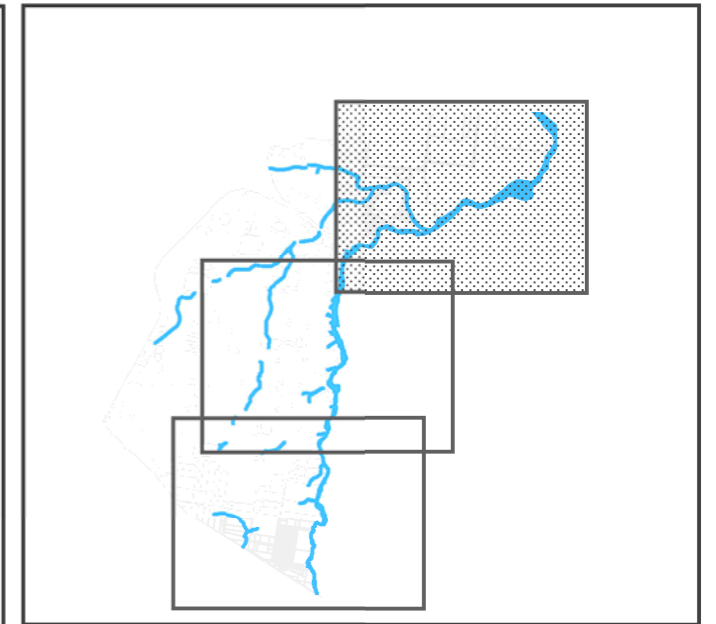
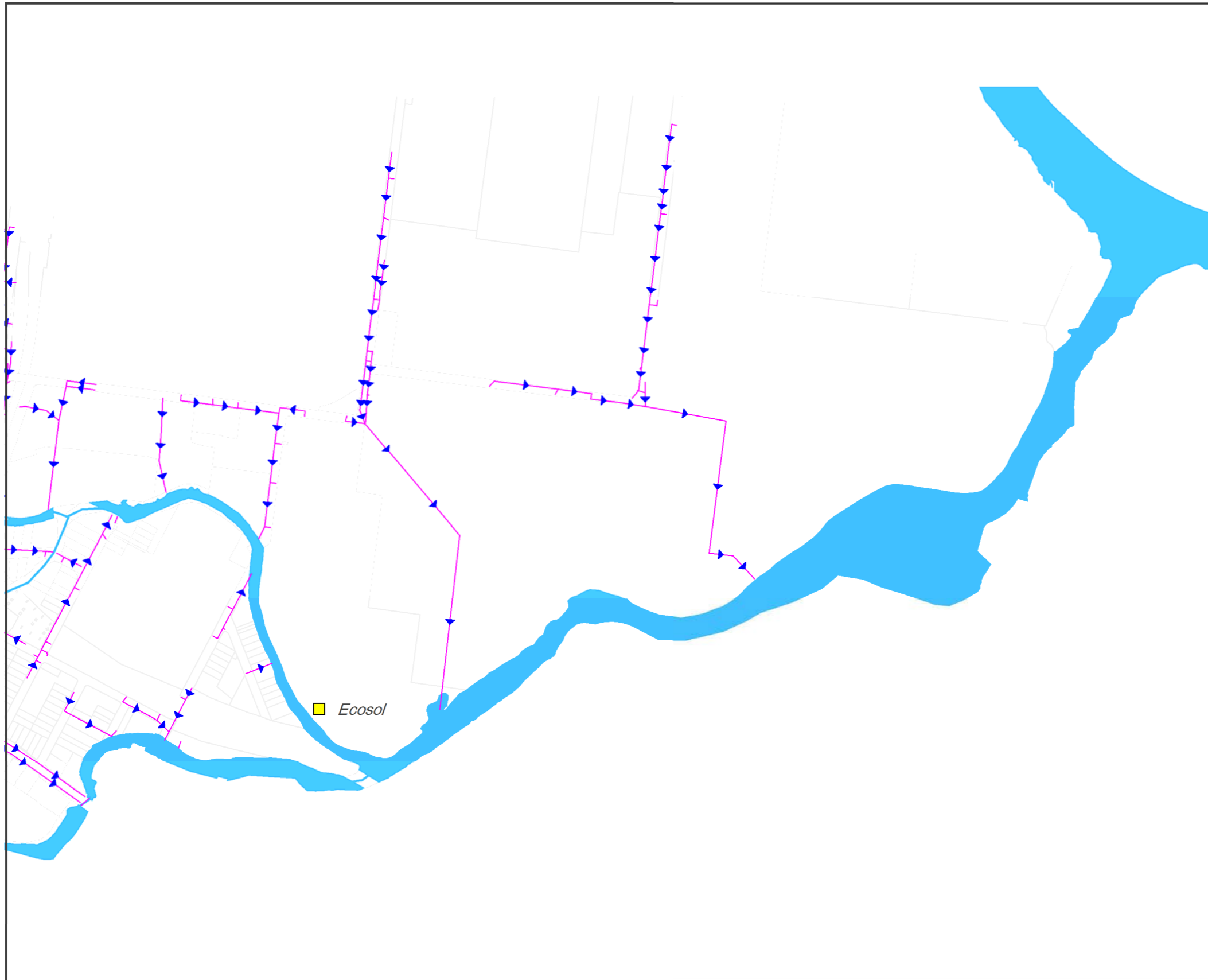
LITTLE DUCK CREEK 1B
CROSS SECTION



file: bathymetry/crosssections
date: 16/05/2012



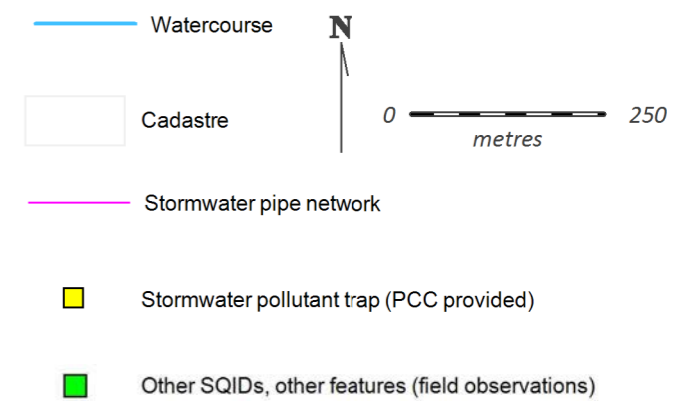
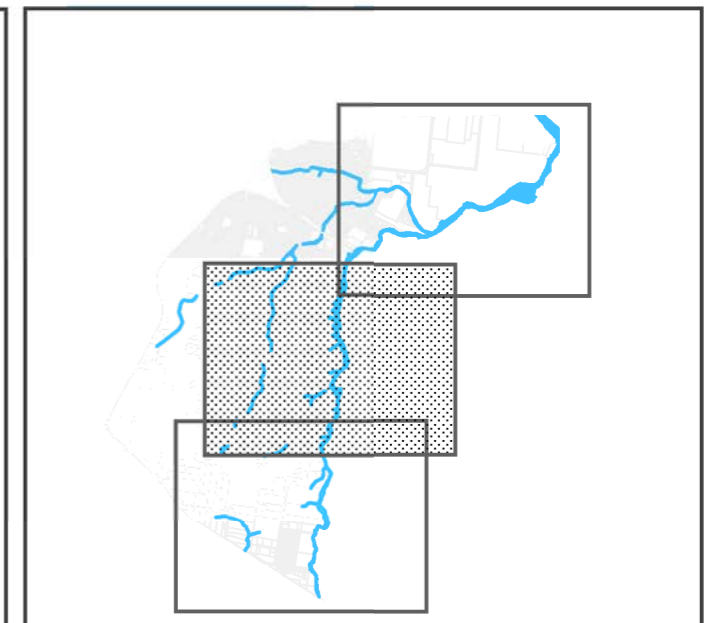
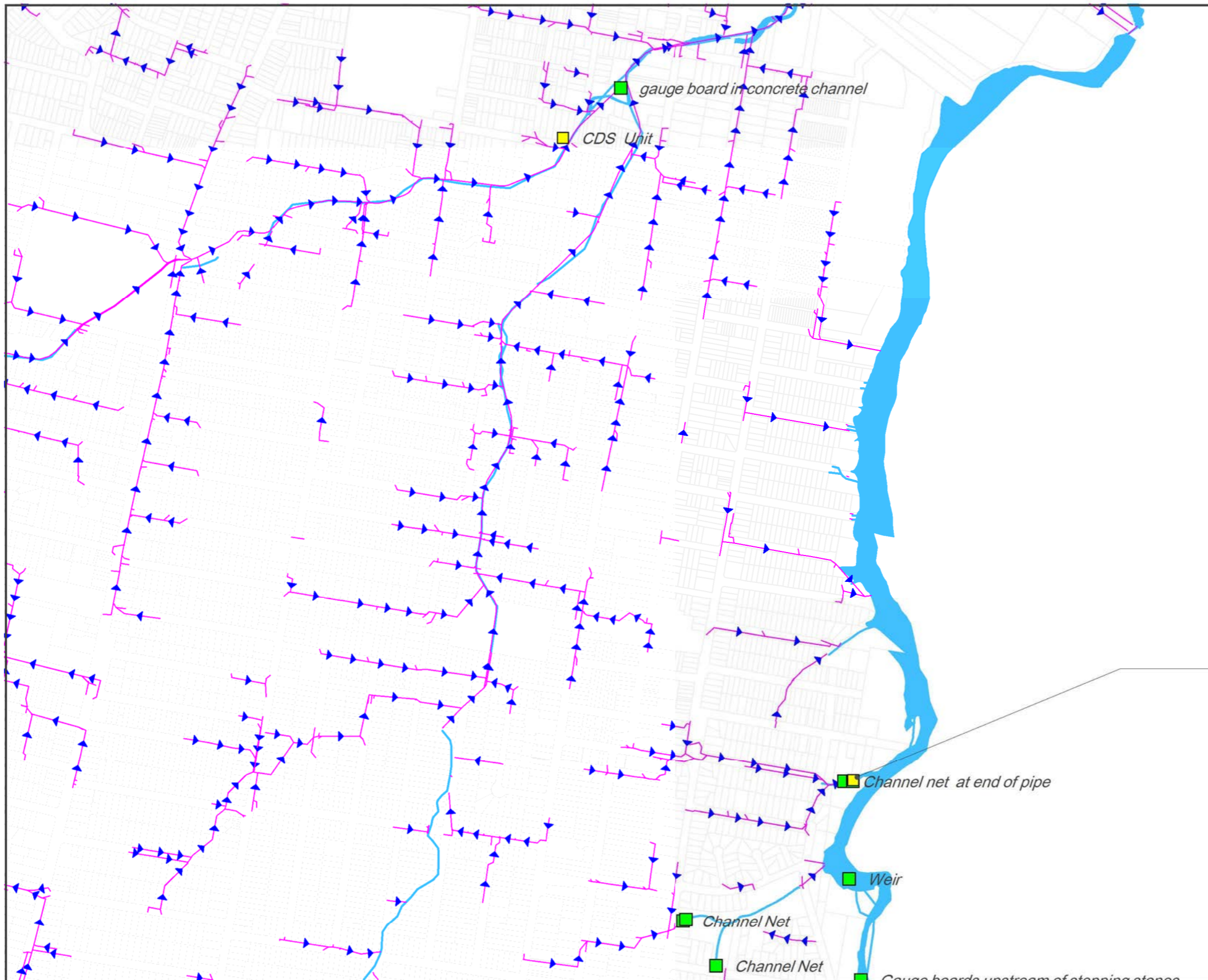
PIPE NETWORK, GPTS AND WEIRS - DUCK RIVER CATCHMENT PARRAMATTA LGA



file: SQIDMP Map 1
date: 14/05/2012



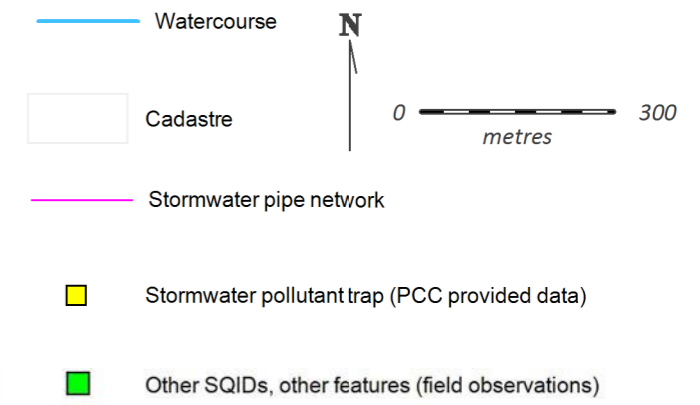
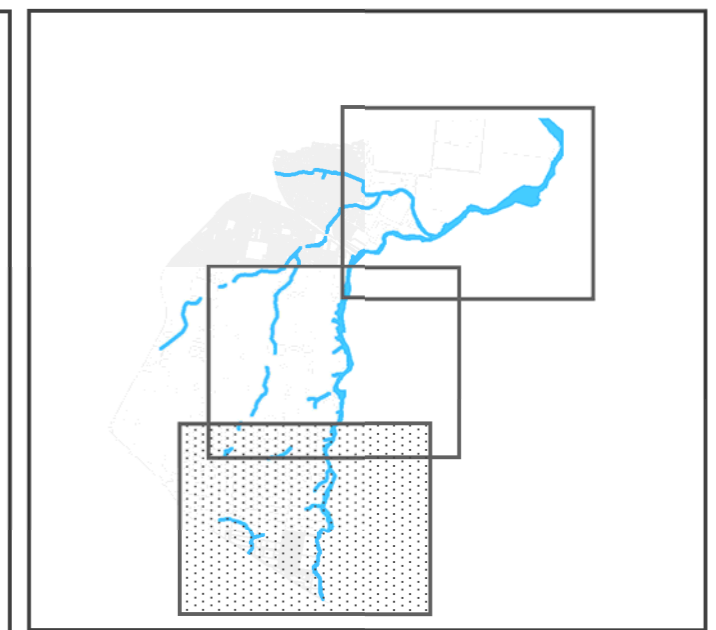
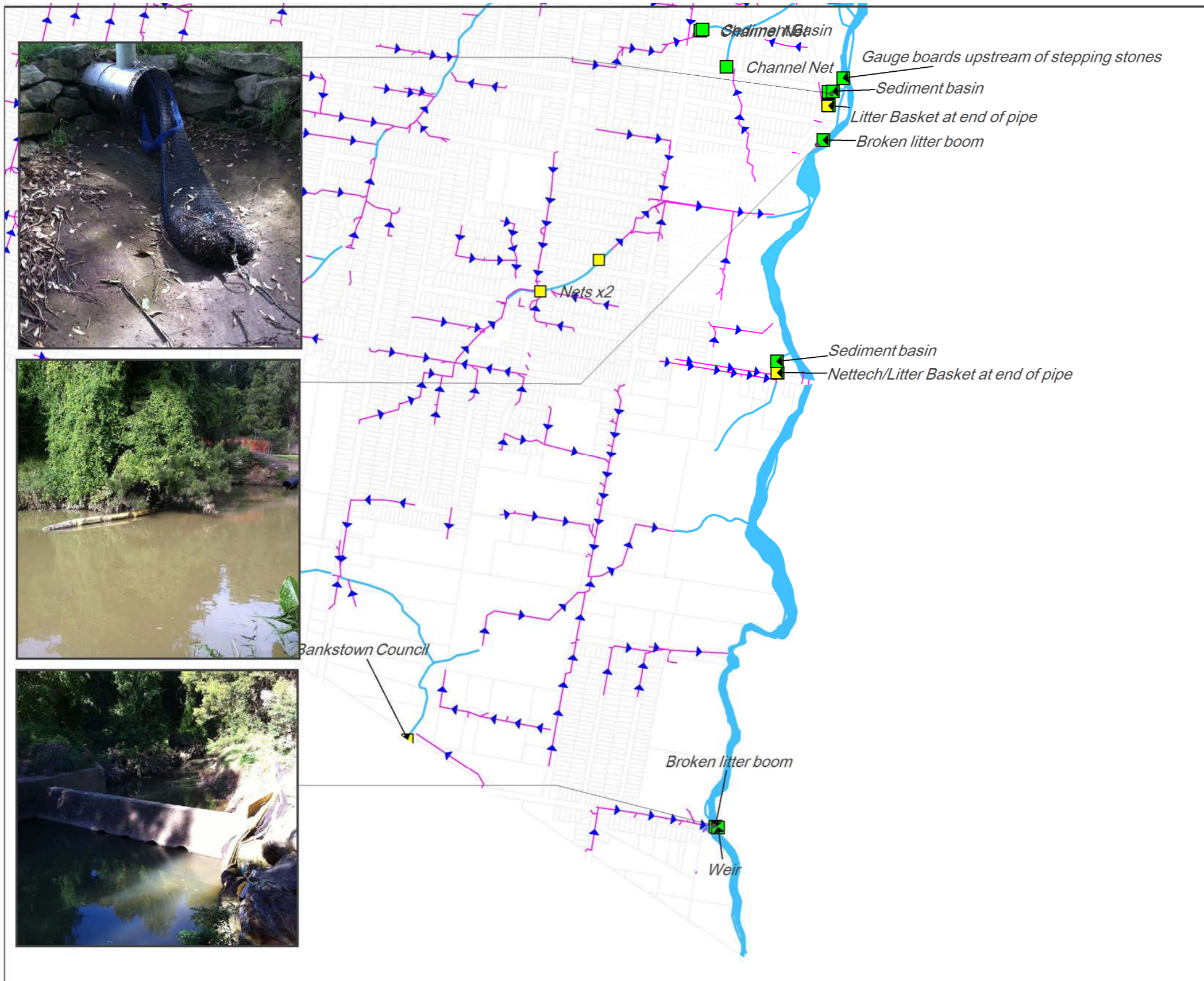
PIPE NETWORK, GPTS AND WEIRS - DUCK RIVER CATCHMENT PARRAMATTA LGA



file: SQIDMP map 2
date: 14/05/2012



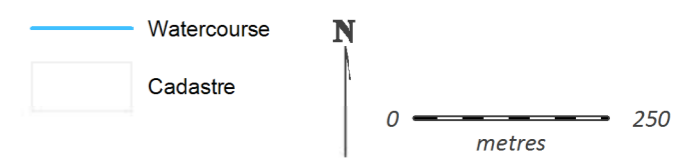
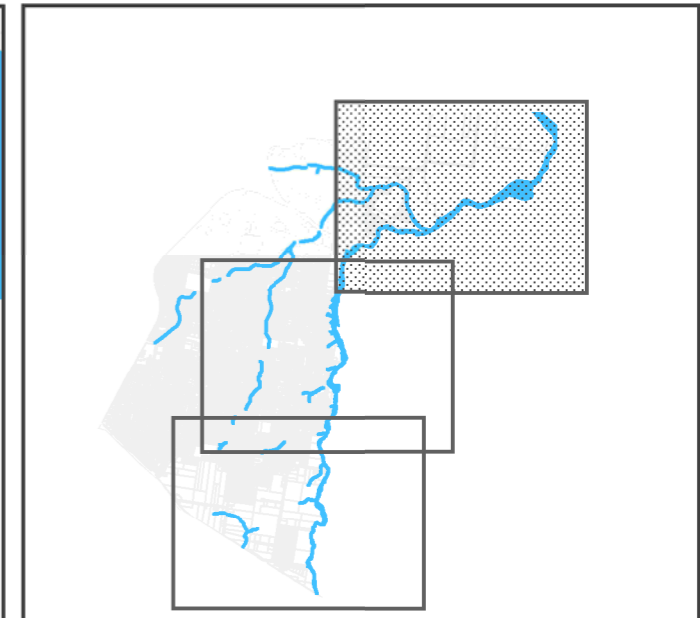
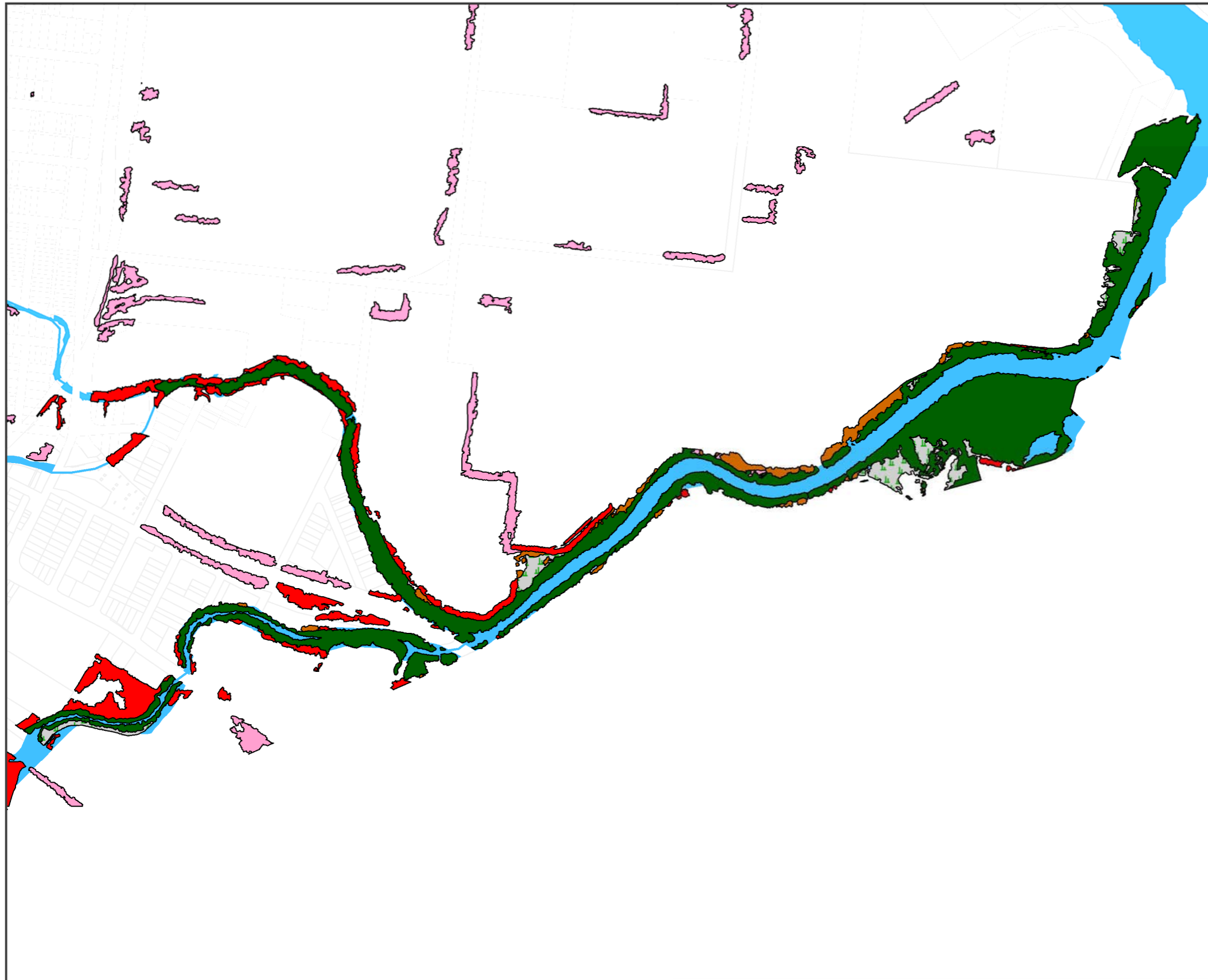
PIPE NETWORK, GPTS AND WEIRS - DUCK RIVER CATCHMENT PARRAMATTA LGA



file: BushRegenMP map 3
date: 13/05/2012



VEGETATION COMMUNITIES DUCK RIVER CATCHMENT PARRAMATTA LGA

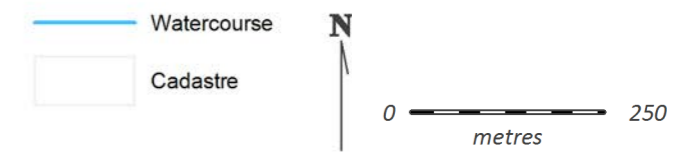
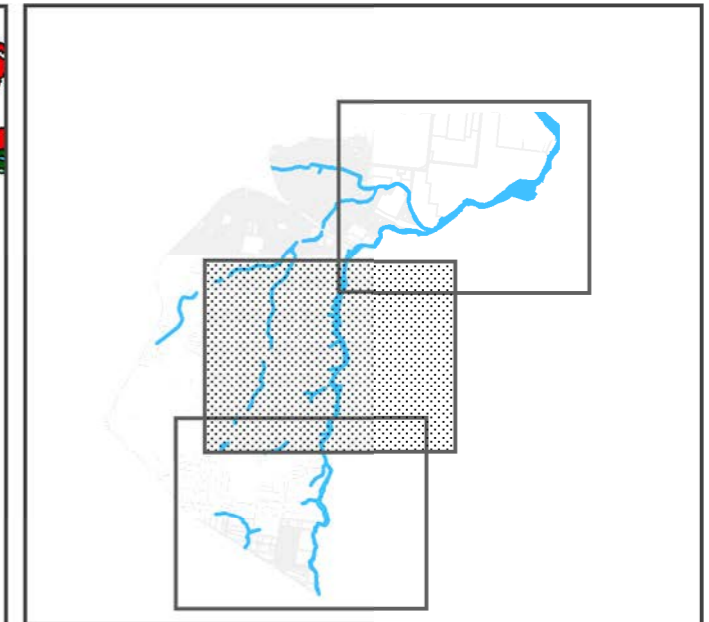
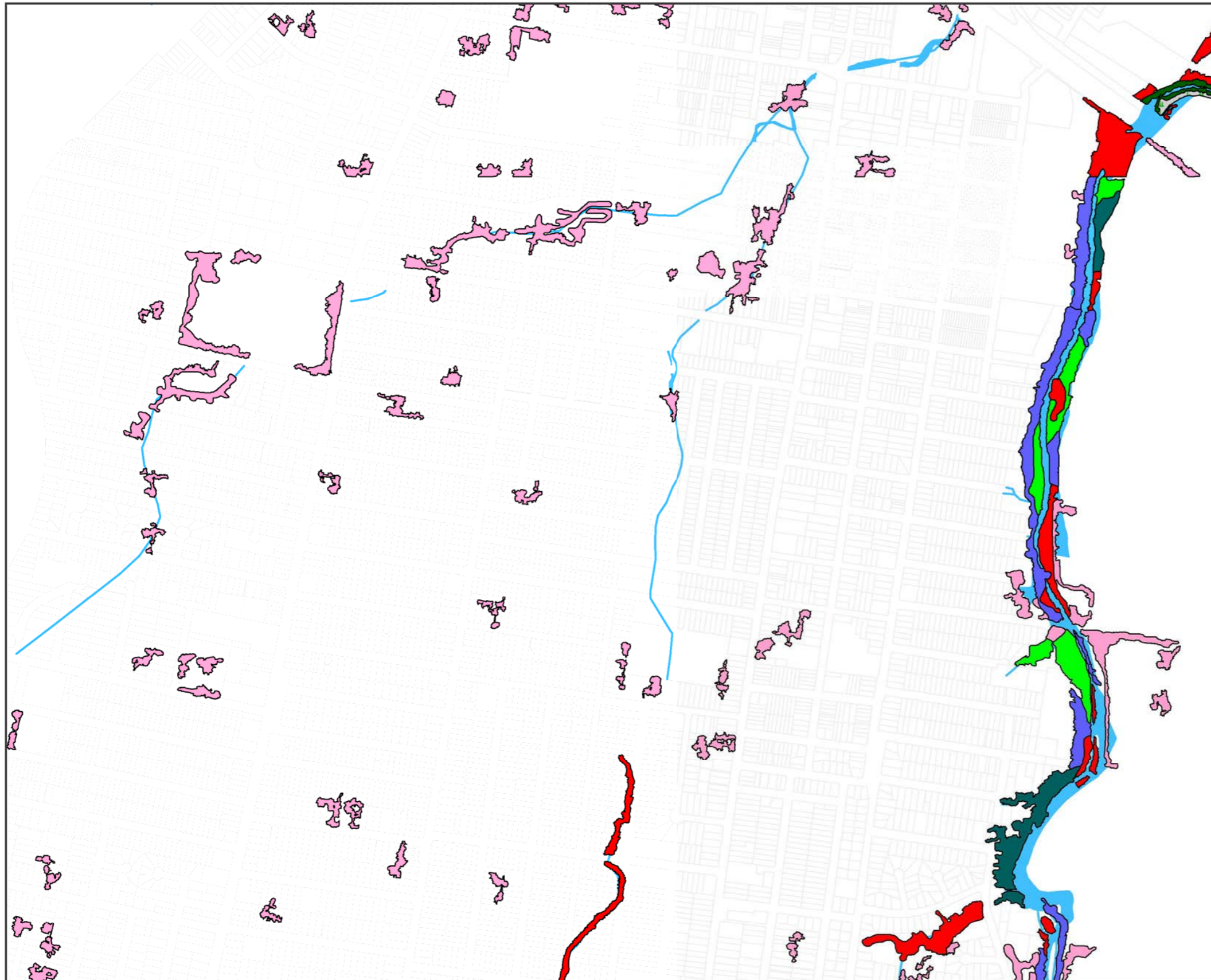


- SMCMA Draft Vegetation Mapping 2009
- Castlereagh Ironbark Forest
 - Castlereagh Shale-Gravel Transition Forest
 - Cumberland Riverflat Forest
 - Cumberland Swamp Oak Riparian Forest
 - Estuarine Swamp Oak Forest
 - Coastal Freshwater Reedland
 - Estuarine Reedland
 - Cumberland Shale Plains Woodland
 - Estuarine Mangrove Forest
 - Estuarine Saltmarsh
 - Urban Remnant Trees
 - Weeds

file: vegetationMP Map 1
date: 13/05/2012



VEGETATION COMMUNITIES DUCK RIVER CATCHMENT PARRAMATTA LGA



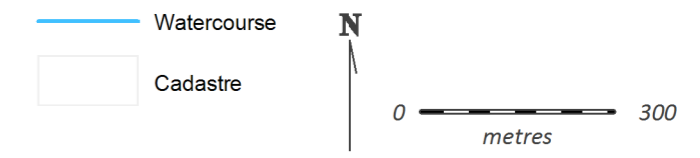
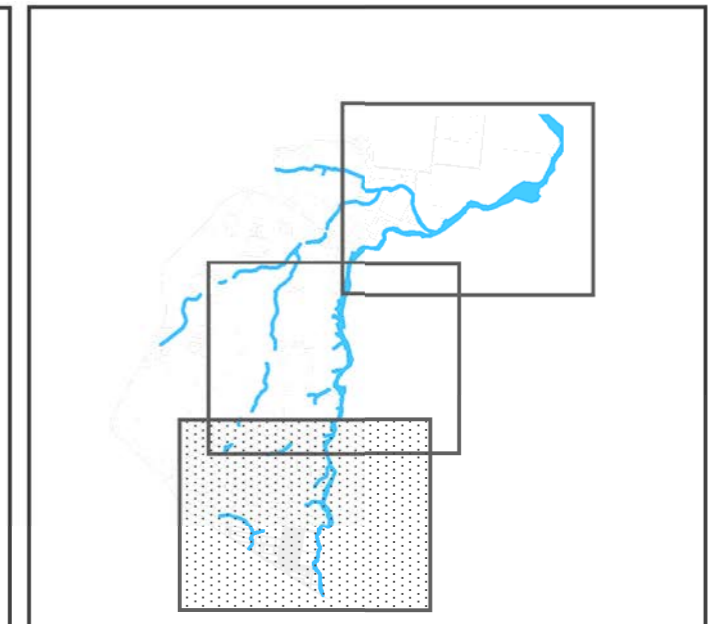
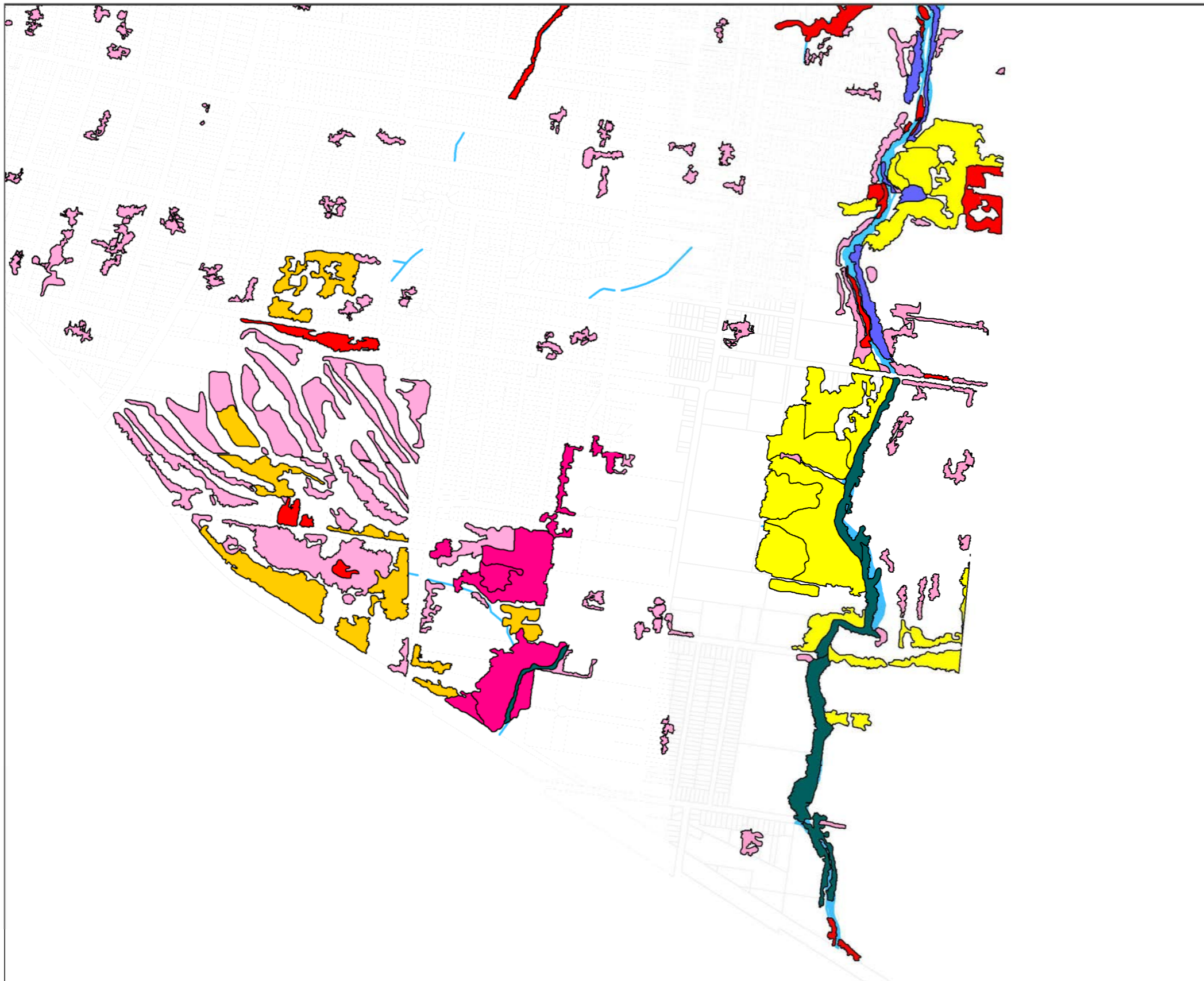
SMCMA Draft Vegetation Mapping 2009

- Castlereagh Ironbark Forest
- Castlereagh Shale-Gravel Transition Forest
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- Estuarine Swamp Oak Forest
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- Estuarine Reedland
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- Estuarine Saltmarsh
- Urban Remnant Trees
- Weeds

file: vegetationMP map 2
date: 13/05/2012



VEGETATION COMMUNITIES DUCK RIVER CATCHMENT PARRAMATTA LGA

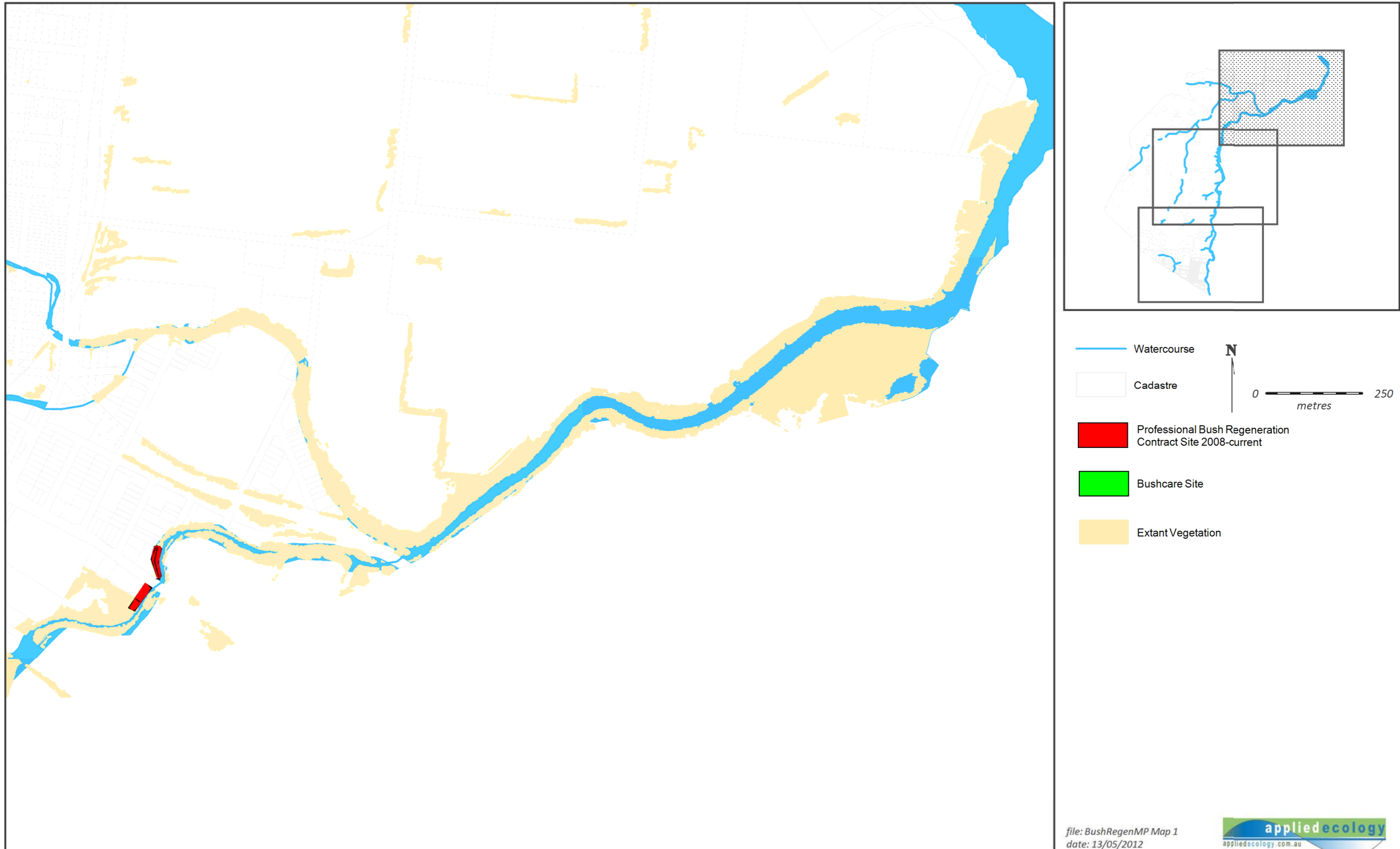


- SMCMA Draft Vegetation Mapping 2009
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 - Estuarine Swamp Oak Forest
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 - Estuarine Mangrove Forest
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 - Urban Remnant Trees
 - Weeds

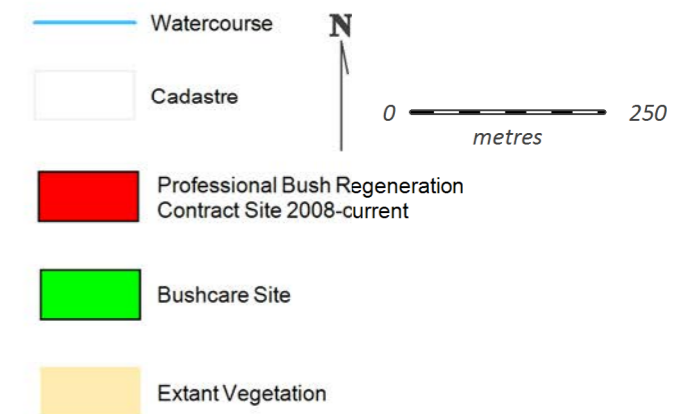
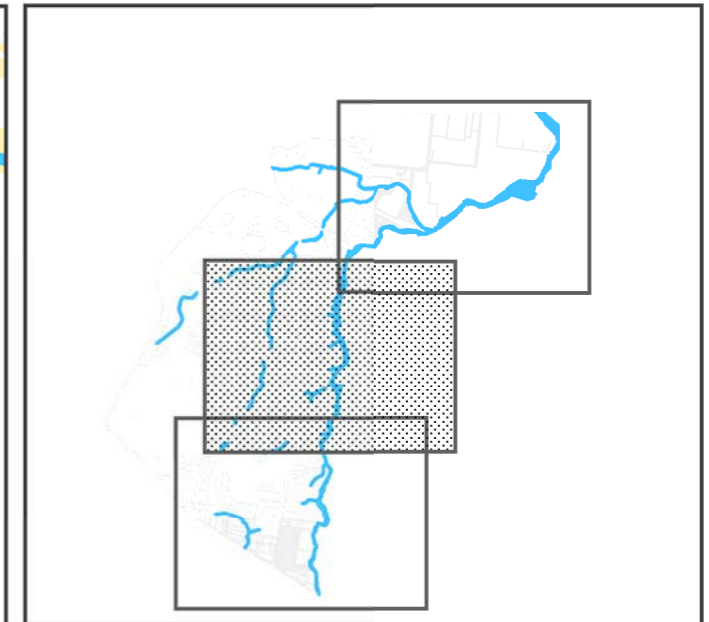
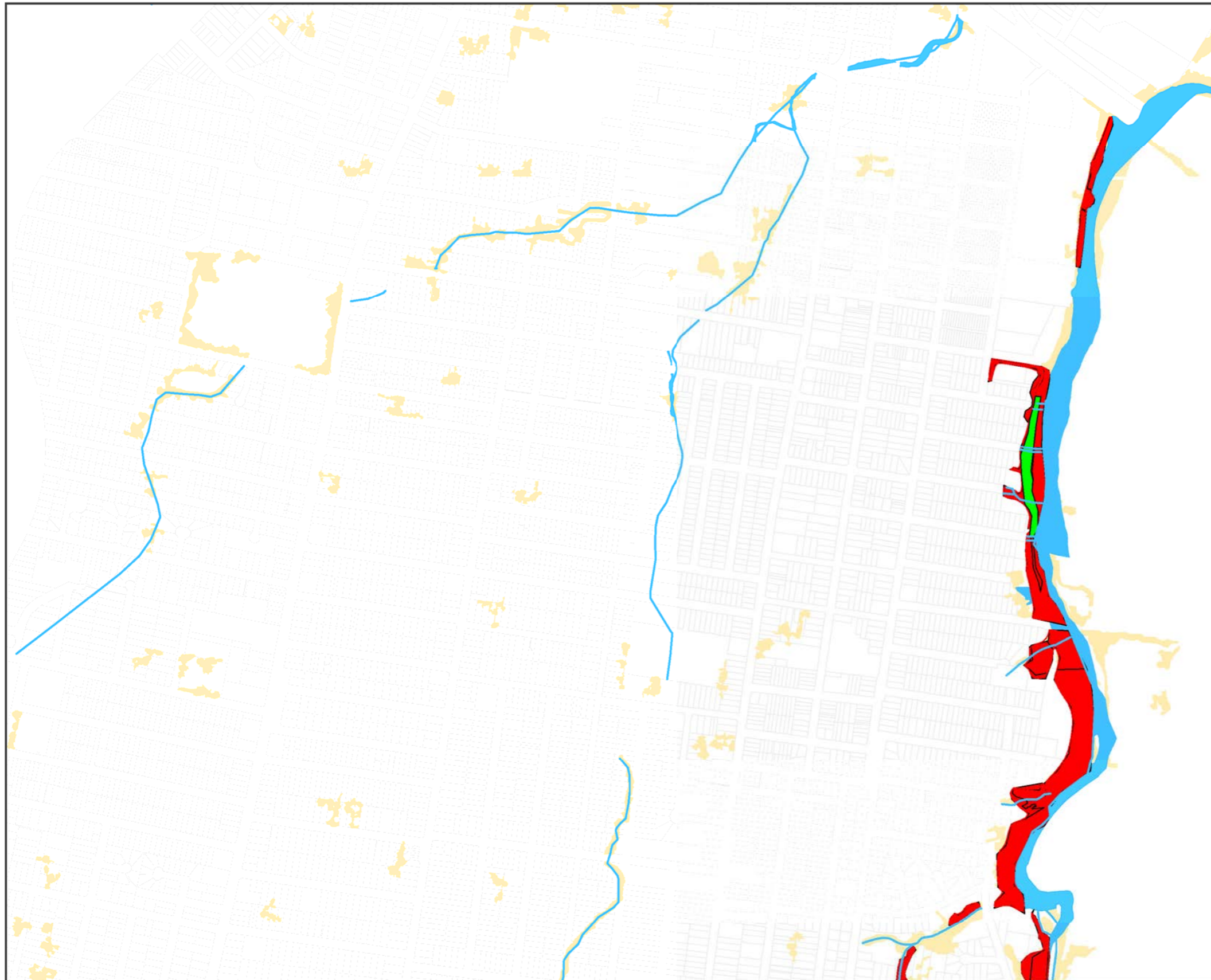
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BUSHCARE / CONTRACT WORK SITES DUCK RIVER MAIN CHANNEL PARRAMATTA LGA



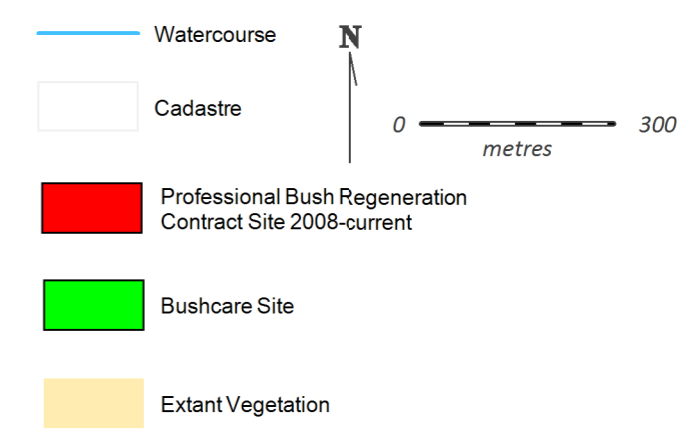
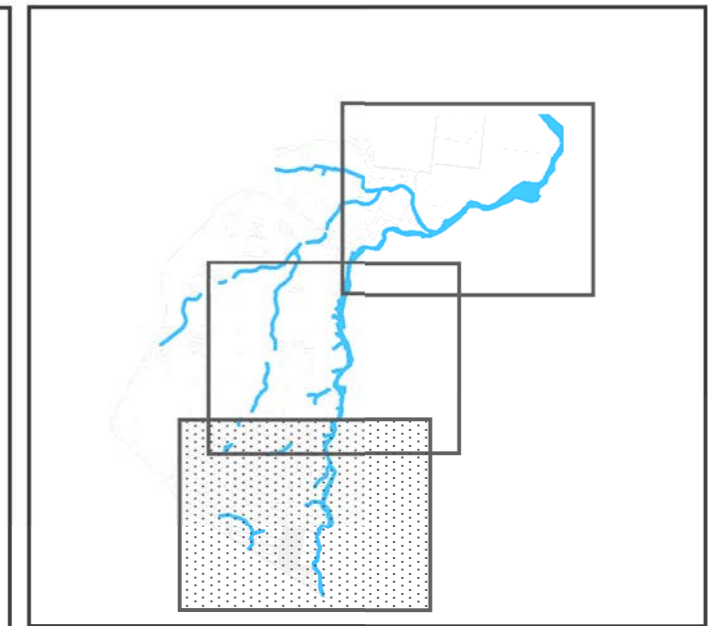
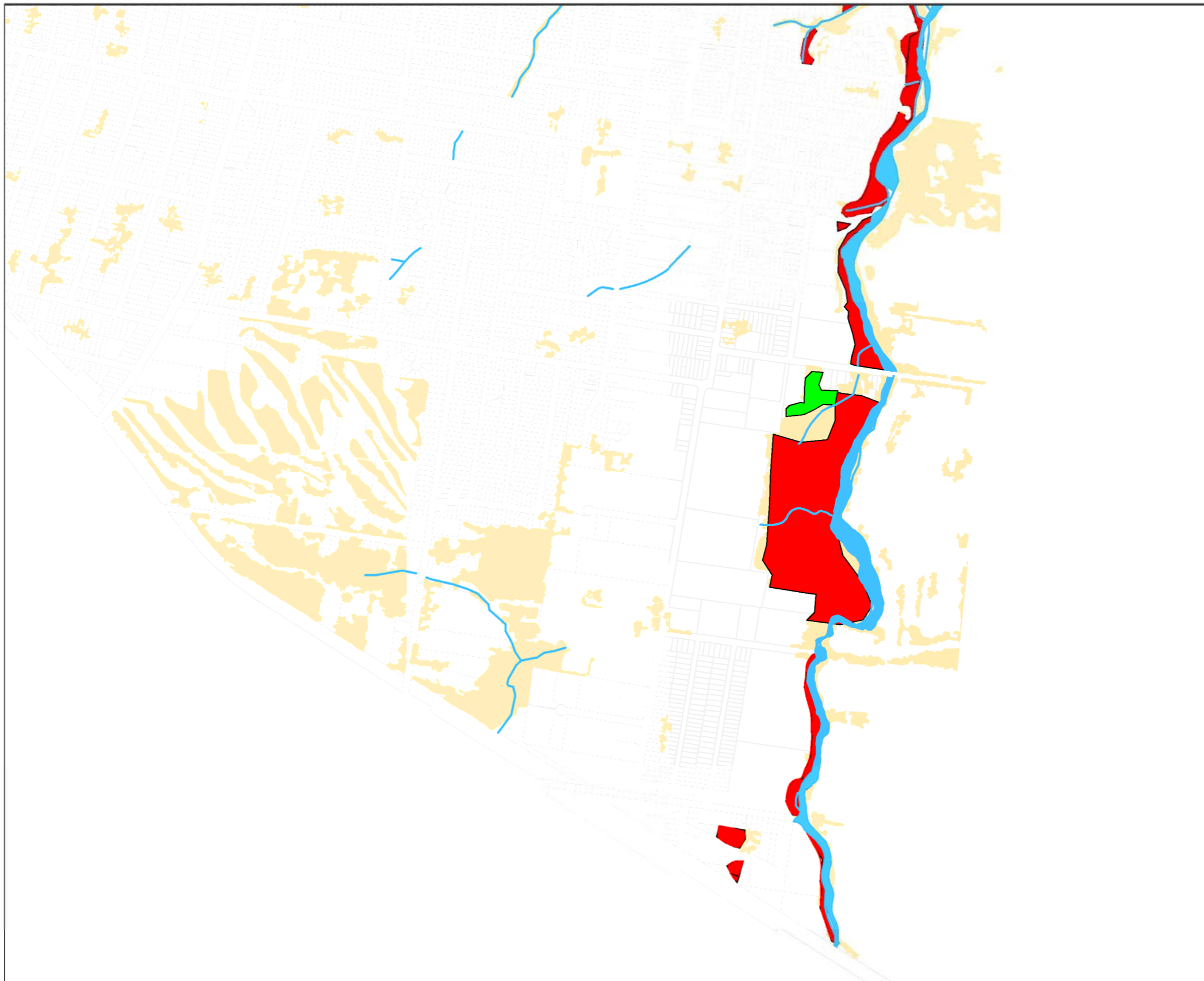
BUSHCARE / CONTRACT WORK SITES DUCK RIVER MAIN CHANNEL PARRAMATTA LGA



file: BushRegenMP map 2
date: 13/05/2012



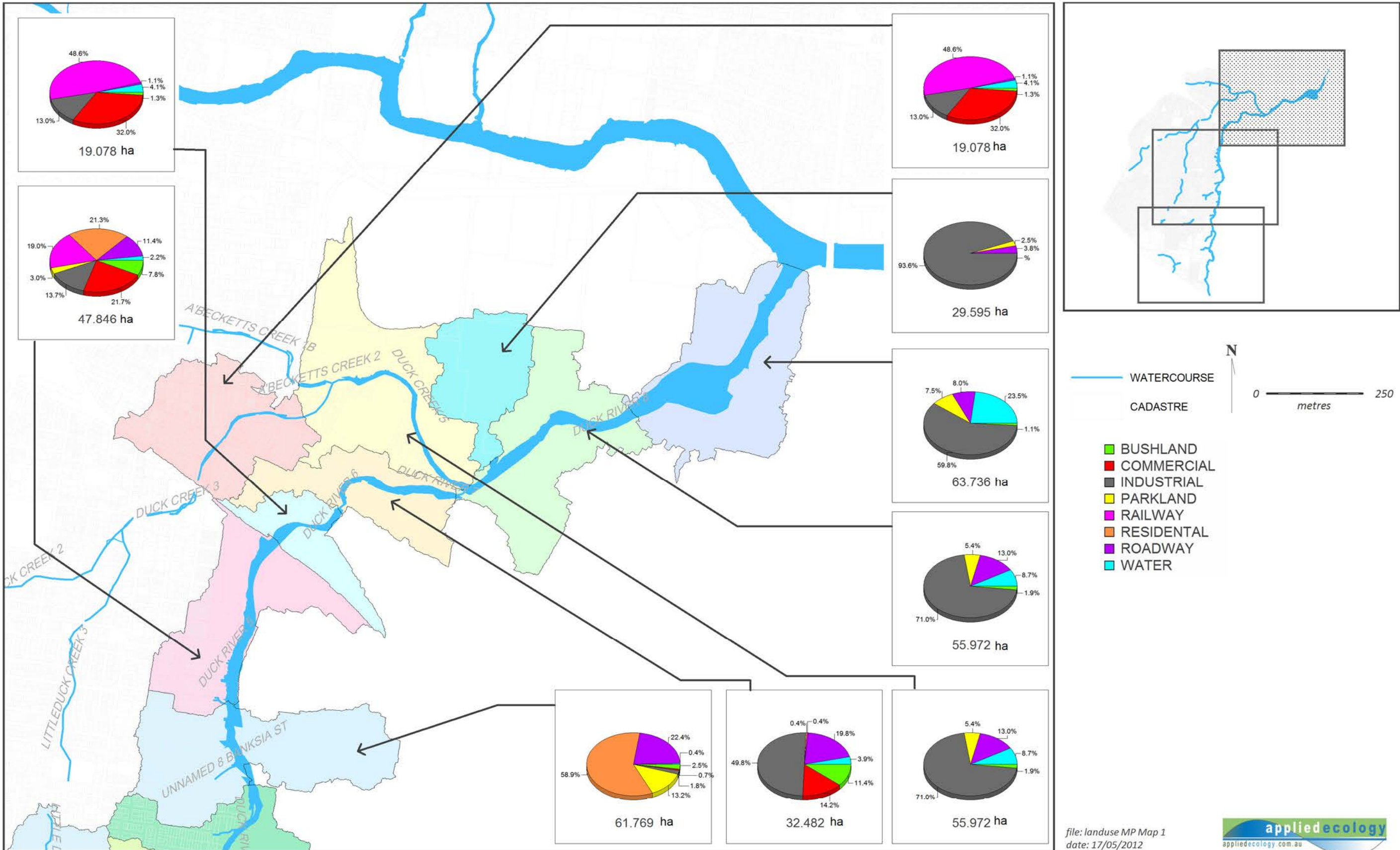
BUSHCARE / CONTRACT WORK SITES DUCK RIVER MAIN CHANNEL PARRAMATTA LGA



file: BushRegenMP map 3
date: 13/05/2012



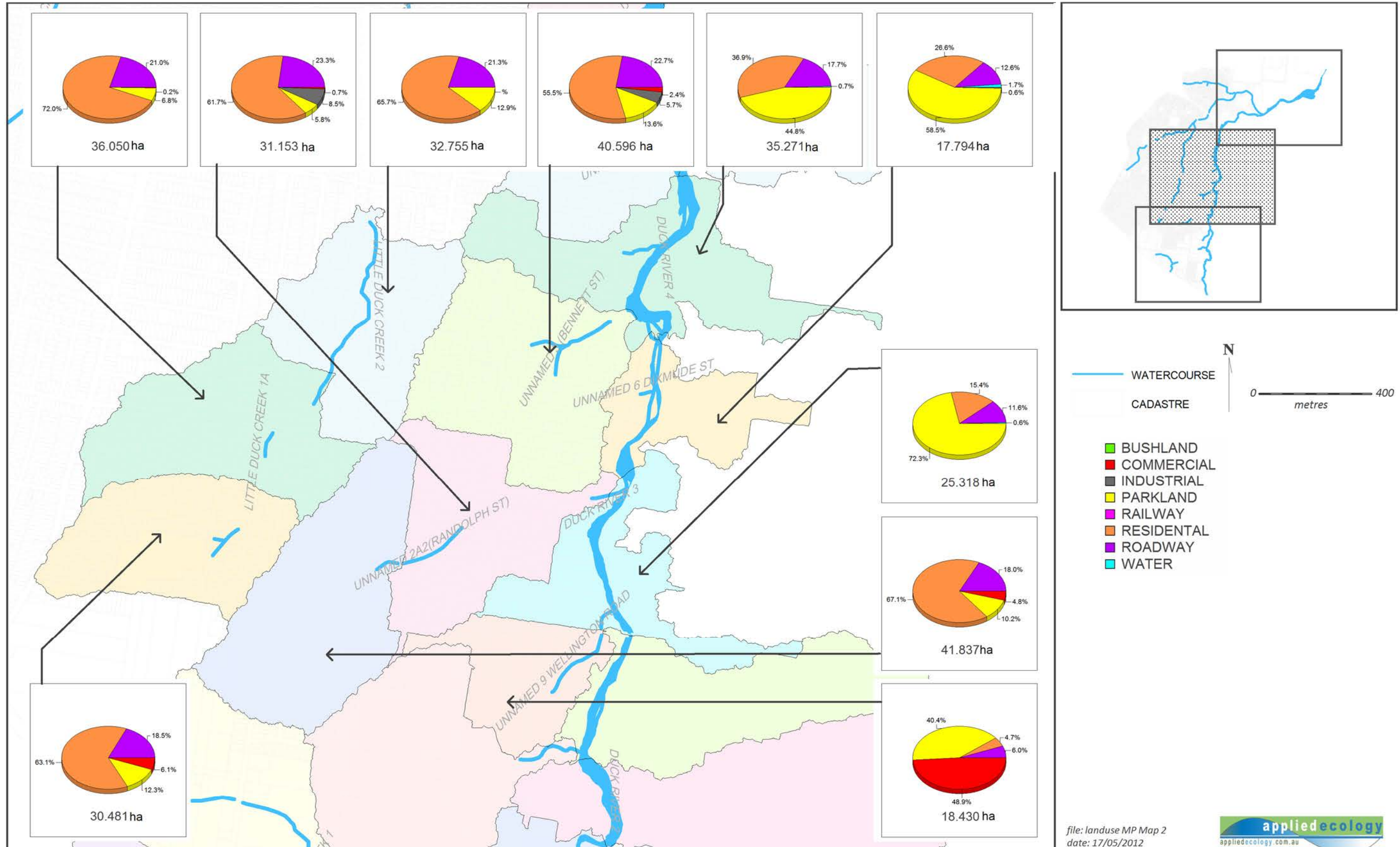
LAND USE DUCK RIVER CATCHMENT PARRAMATTA LGA



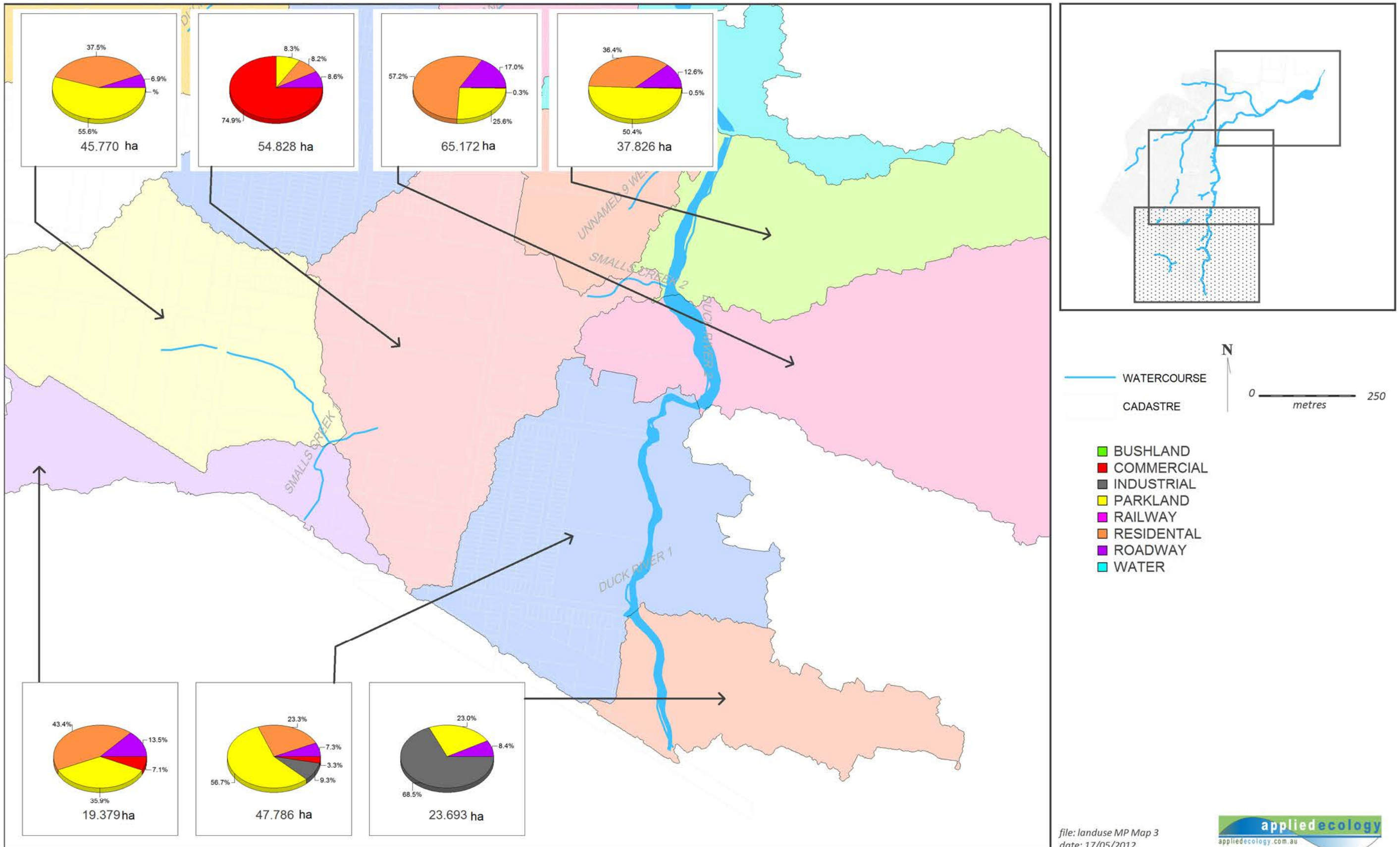
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LAND USE DUCK RIVER CATCHMENT PARRAMATTA LGA



LAND USE DUCK RIVER CATCHMENT PARRAMATTA LGA



AHIMs (INDIGENOUS HERITAGE)

OEH maintains the Aboriginal Heritage Information Management System which includes:

- information about Aboriginal objects that have been reported to the Director General, Department of Premier and Cabinet
- information about Aboriginal places which have been declared by the Minister to have special significance with respect to Aboriginal culture
- archaeological reports.

An Aboriginal site that is recorded on AHIMS could be:

- an Aboriginal object (as defined under the NPW Act)
- a group (i.e. a collection, scattering, deposit etc) of Aboriginal objects
- an area of land containing Aboriginal objects
- a "potential" archaeological deposit which is an area where, based on previous investigation, Aboriginal objects are likely to be present
- a declared Aboriginal place (as defined under the NPW Act), which may or may not contain Aboriginal objects
- an Aboriginal site that has been partially or completely destroyed under the conditions of a past consent.

The following lots were searched for AHIMs records:

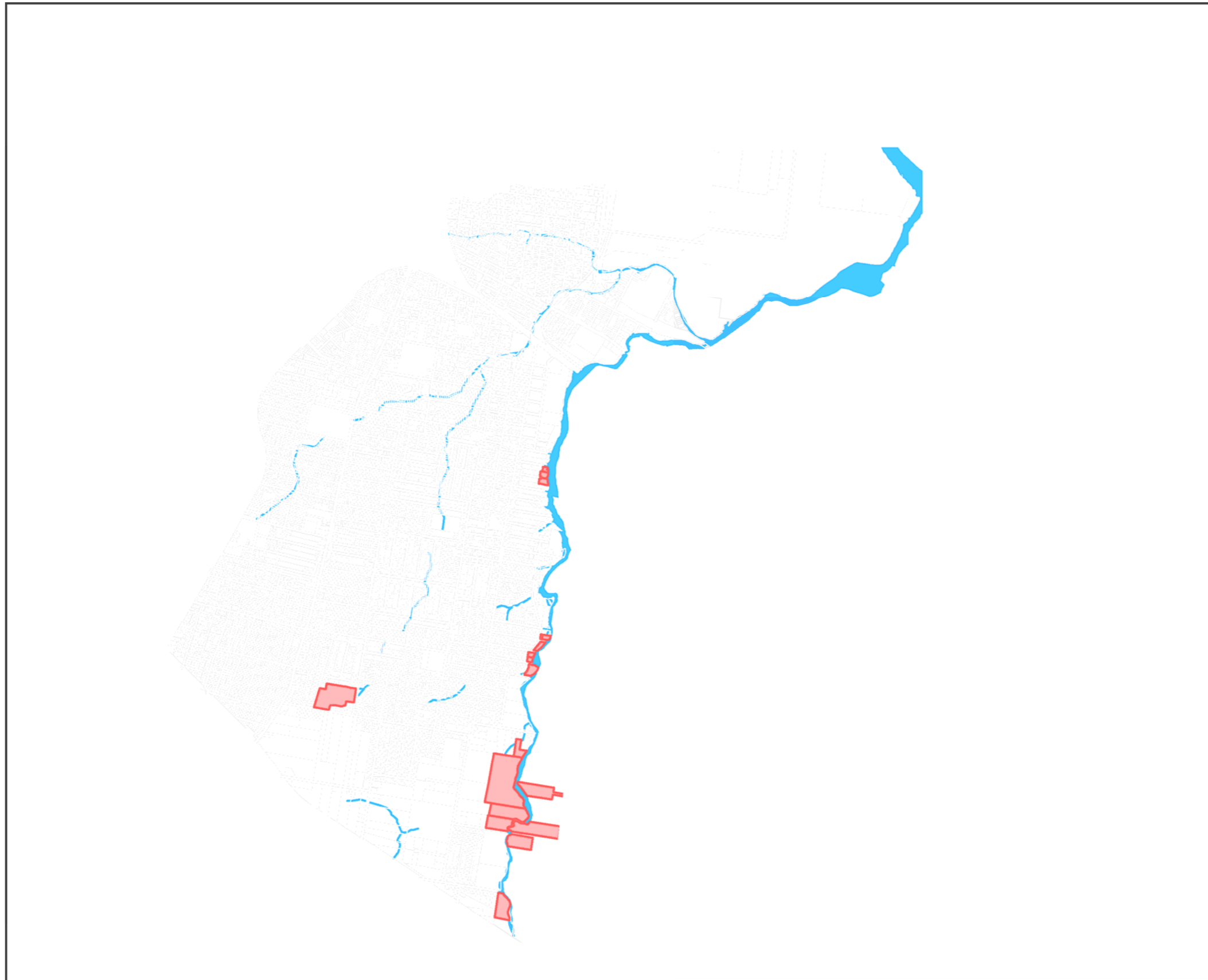
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3	DP1063022	7 Hector ST Chester Hill 2163	0	
82	DP1098129	7 Hector Street CHESTER HIL		
81	DP1098129	7 Hector Street CHESTER HIL	1	
B	DP379153	1 Boundary Road CHESTER HILL		
A	DP379153	8 Everley Road CHESTER HILL	?	
1	DP222670	1 Everley Road CHESTER HILL	5	
B	DP415520	1 Everley Road CHESTER HILL	4	
1	DP217144	20 Wellington Road SOUTH GRANVILLE	8	
B	DP399373	20 Wellington Road SOUTH GRANVILLE	2	
A	DP407154	20 Wellington Road SOUTH GRANVILLE	2	
1	DP315287	20 Wellington Road SOUTH GRANVILLE	0	
5	DP192307	2A Erie Street SOUTH GRANVILLE		
6	DP192307	2A Erie Street SOUTH GRANVILLE		
7	DP192307	2A Erie Street SOUTH GRANVILLE		
8	DP192307	2A Erie Street SOUTH GRANVILLE		
1	DP514641	2A Erie Street SOUTH GRANVILLE	1	
279	DP8821	2A Erie Street SOUTH GRANVILLE	1	
280	DP8821	2A Erie Street SOUTH GRANVILLE	1	
4	DP226117	4 Namur Street SOUTH GRANVILLE	1	
2	DP509796	1B Mackay Road SOUTH GRANVILLE	1	
3	DP509796	1B Mackay Road SOUTH GRANVILLE	1	

LOT NO	DP NO	ADDRESS	ABORIGINAL SITE RECORDED	ABORIGINAL PLACE RECORDED
185	DP8821	1B Mackay Road SOUTH GRANVILLE		
184	DP8821	2A Dixmude Street SOUTH GRANVILLE		
1	DP224184	1B Mackay Road SOUTH GRANVILLE		
147	DP8821	1B Mackay Road SOUTH GRANVILLE		
3	DP224184	1B Mackay Road SOUTH GRANVILLE		
4	DP224184	1B Mackay Road SOUTH GRANVILLE		
7	DP213194	1B Mackay Road SOUTH GRANVILLE		
6	DP213194	1B Mackay Road SOUTH GRANVILLE		
5	DP213194	1B Mackay Road SOUTH GRANVILLE		
C	DP408818	1B Mackay Road SOUTH GRANVILLE		
26	DP8821	1B Mackay Road SOUTH GRANVILLE		
25	DP8821	1B Mackay Road SOUTH GRANVILLE		
1	DP594805	1B Mackay Road SOUTH GRANVILLE		
1	DP512705	1A Byrnes Street SOUTH GRANVILLE	1	
1	DP633508	1 Banksia Street SOUTH GRANVILLE		
D	DP421599	124 Mona Street SOUTH GRANVILLE		
188	DP650719	131 Mona Street SOUTH GRANVILLE		
7	DP30910	1A Heath Street GRANVILLE		
159	DP6784	2 Neilson Street GRANVILLE		
2	DP204101	1A Neilson Street GRANVILLE		
117	DP6784	2 Mimosa Street GRANVILLE	1	
84	DP6784	1 Mimosa Street GRANVILLE	1	
83	DP6784	2 Myrtle Street GRANVILLE	1	
48	DP6784	1 Myrtle Street GRANVILLE		
47	DP6784	6A Seventh Street GRANVILLE		
25	DP6784	1 Seventh Street GRANVILLE		
2	DP707627	1B Factory Street GRANVILLE		
2	DP115286	1B Factory Street GRANVILLE		
1	DP1012953	2B Factory Street GRANVILLE		
101	DP619247	23 Factory Street GRANVILLE		
102	DP619247	1A Factory Street GRANVILLE		
2	DP775151	1A Factory Street GRANVILLE		
1	DP775151	2A Factory Street GRANVILLE		
4	DP803347	36 Railway Lands CLYDE		
	SP64725	13 Berry Street CLYDE		
1	DP220361	53 Rowley Road GUILDFORD	1	
1	DP22886	121 Rawson Road GUILDFORD		
21	DP27820	327 Excelsior Street GUILDFORD		
32	DP241618	327 Excelsior Street GUILDFORD		
40	DP2287	78 Guildford Road GUILDFORD		
11	DP2287	78 Guildford Road GUILDFORD		
20	DP868	53 Guildford Road GUILDFORD		
park	249			
21	DP868	52 Eve Street GUILDFORD		
2	DP626900	46 Eve Street GUILDFORD		
	reserve			
18	DP945	45 Eve Street GUILDFORD		

LOT NO	DP NO	ADDRESS	ABORIGINAL SITE RECORDED	ABORIGINAL PLACE RECORDED
24	DP945	110 Robertson Street GUILDFORD		
14	DP945	91 Robertson Street GUILDFORD		
32	DP945	87 Robertson Street GUILDFORD		
36	DP945	87 Robertson Street GUILDFORD		
41	DP945	30 Adam Street GUILDFORD		
28	DP945	31 Adam Street GUILDFORD		
32	DP945	58 Wolseley Street MERRYLANDS		
37	DP945	54 Wolseley Street MERRYLANDS		
40	DP945	54 Wolseley Street MERRYLANDS		
45	DP945	48 Wolseley Street MERRYLANDS		
1	DP136166	196 Blaxcell Street SOUTH GRANVILLE		
11	DP192747	196 Blaxcell Street SOUTH GRANVILLE		
102	DP794050	33 Lackey Street SOUTH GRANVILLE		
23	DP1788	34A Lisgar Street GRANVILLE		
3	DP1788	14 Stuart Street GRANVILLE		
B	DP367480	1 Abbott St Merrylands		
21	DP1788	39 Thomas Street GRANVILLE		
26A	DP947	34 Louis Street GRANVILLE		
72	DP998931	23 Louis Street GRANVILLE		
54	DP277	11A John Street GRANVILLE		
21	DP4978	9 Glen Street GRANVILLE		
4	DP16699	9 Glen Street GRANVILLE		
C	DP355997	1A Glen Street GRANVILLE		
1	DP794229	2 Blaxcell Street GRANVILLE		
1	DP430693	1 Memorial Drive GRANVILLE		
1	DP1010807	151 Railway Parade GRANVILLE		
200	DP752058			
1	DP336811	3 Onslow Street GRANVILLE		
15	DP850536			
6	DP850536	22 Hamilton Street CLYDE		
7	DP808181	1 Motorway M4 CLYDE		
71	DP800279	32 Wentworth Street CLYDE		
1	DP585919	21 Wentworth Street CLYDE	Not on data base	
21	DP817742	1A Unwin Street ROSEHILL		
2	DP864567	3-11 Shirley Street ROSEHILL		
1	DP109739	9 Devon Street ROSEHILL		
1	DP534905	9B Devon Street ROSEHILL		
2	DP224288	9 Devon Street ROSEHILL		
AUBURN				
51	DP 1081545	353 Chisholm Rd Auburn		
8	975170	Chisholm Rd Auburn		
6	192307	Chisholm Rd Auburn Princes Park		
A	397547	Peter Hislop Park	4	
B	65888	Golf course	4	
7	25613	Golf course		

LOT NO	DP NO	ADDRESS	ABORIGINAL SITE RECORDED	ABORIGINAL PLACE RECORDED
2	723928	Golf course	2	
9	10163	Golf course		
17	9380	Golf course		
21	13471	Golf course		
4	192307	Progress Park		
30	6713	Killeen Street Auburn		
29	6713	98 Chiswick Road Auburn		
1	938994	Auburn Community Picnic area		
7016	93911	99 Chiswick Road Auburn		
1	222366	99 Chiswick Road Auburn		
12	7097	Webbs Ave Auburn		
36	7097	Webbs Ave Auburn		
14	6338	Webbs Ave playing fields		
42	1463	Webbs Ave Auburn		
7014	93912			
43	1463	Webbs Ave Auburn		
1	514799	Arthur Street Auburn		
1	121657	Webbs Avenue		
28	8800	Edgar Street		
7020	93917	Edgar Street		
1	197476	Edgar Street		
2	197476	Edgar Street		
2	224387			
4	197476	Euston Road		
5	197476	Euston Road		
6	197476	Oriole Stadium		
8	197476	Euston Road		
9	197476	Euston Road		
3	197476	Euston Road		
7012	93894	Euston Road		
7050	93893	Chisholm Road		
6	975152	Bangor Street		
2	975152	Bangor Street		
33	975152	Bangor Park		
6	1007656	Chisholm Road		
1	1007656	Railway Lands		
201	1007683	?		

AHIMs SEARCH DUCK RIVER CATCHMENT PARRAMATTA LGA



file: AHIMs_MP
date: 13/05/2012



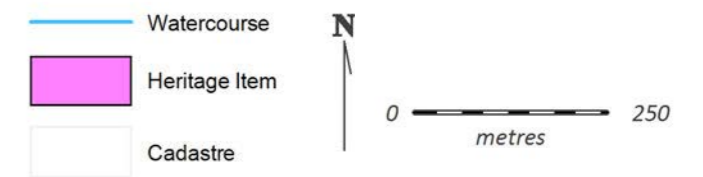
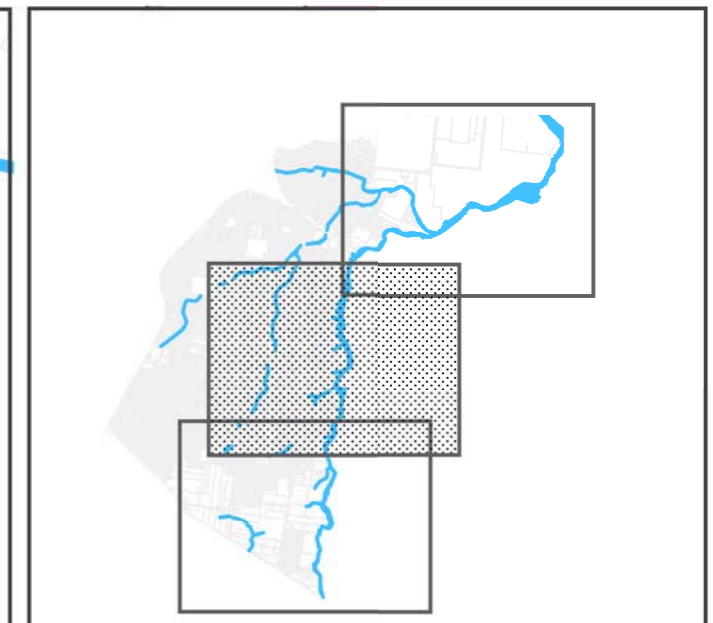
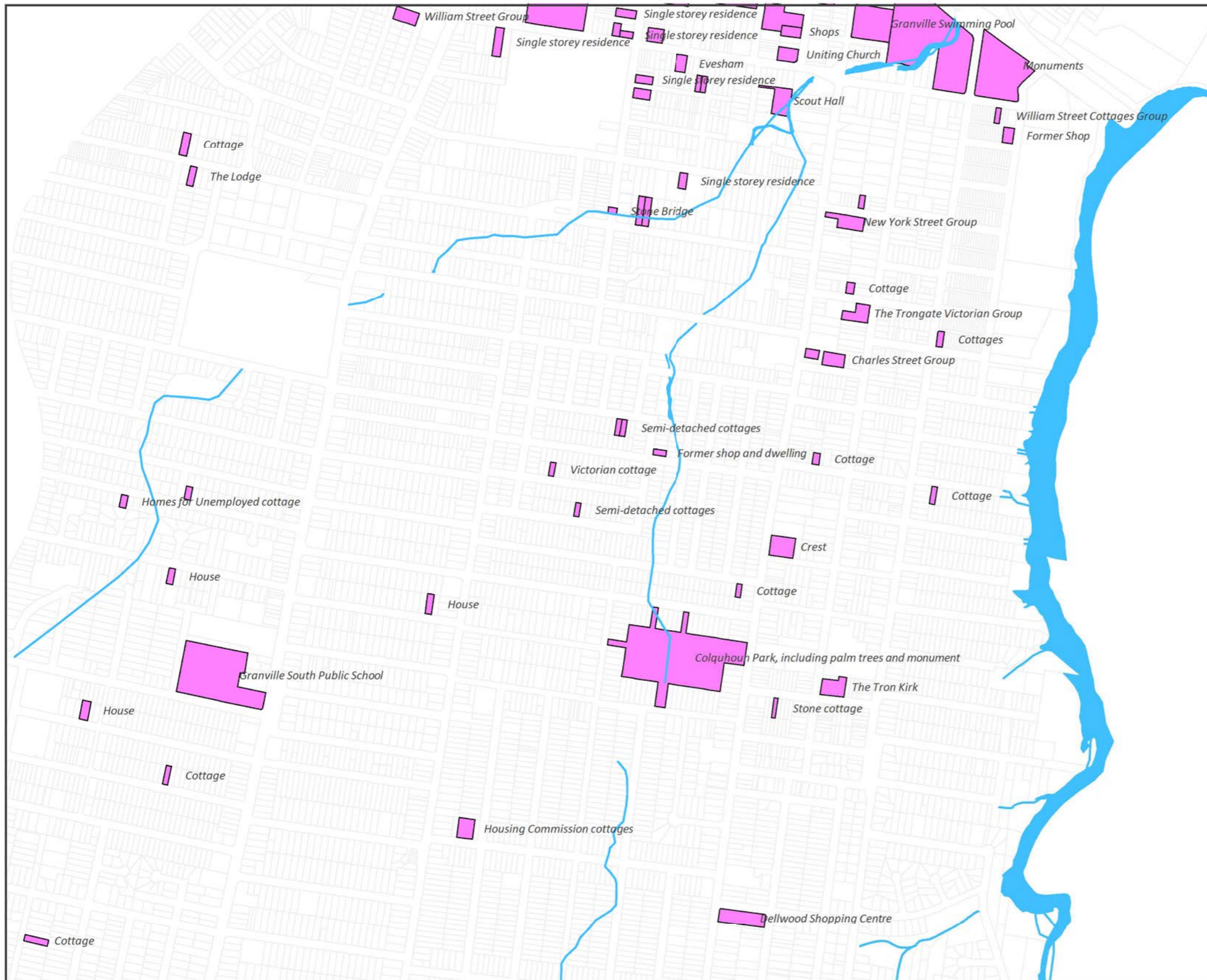
HERITAGE ITEMS (EUROPEAN /GENERAL) DUCK RIVER CATCHMENT PARRAMATTA LGA



file: MP_reportmaps heritage1
date: 13/05/2012



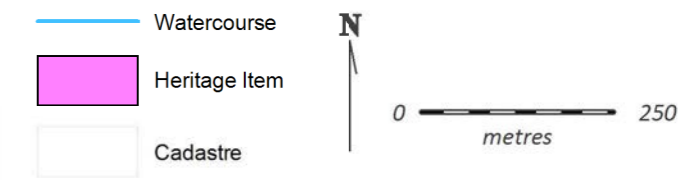
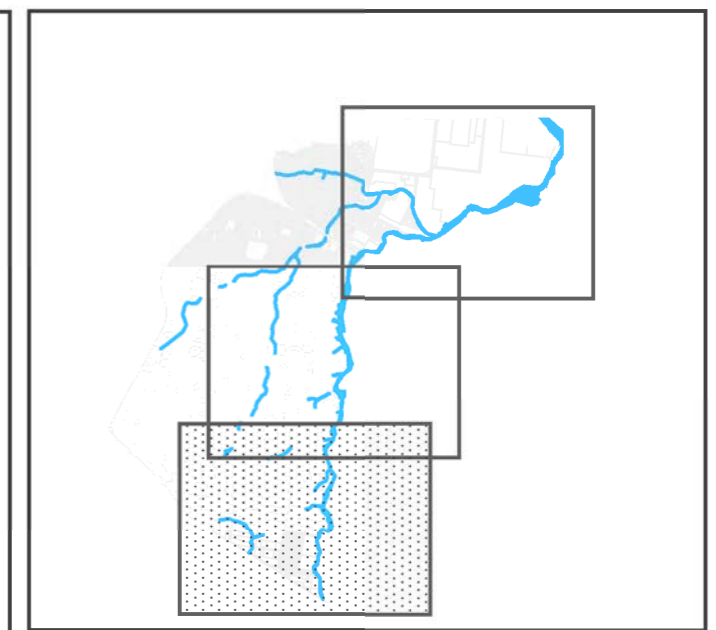
HERITAGE ITEMS (EUROPEAN /GENERAL) DUCK RIVER CATCHMENT PARRAMATTA LGA



file: MP_reportmaps heritage2
date: 13/05/2012



HERITAGE ITEMS (EUROPEAN /GENERAL) DUCK RIVER CATCHMENT PARRAMATTA LGA



file: MP_reportmaps heritage3
date: 13/05/2012



Contaminated Land Register

Site contamination as a legacy of past site uses is not uncommon, particularly in an urban environment. The sites appearing on the 'List of NSW contaminated sites notified to EPA' indicate that the notifiers consider that the sites are contaminated and warrant reporting to EPA. However, the contamination may or may not be significant enough to warrant regulation by EPA. The EPA reviews the site, and makes a determination as to whether the site warrants regulation. Sites are allocated to a management class (Table 1). The list only contains contaminated sites that EPA is aware of, with regard to its regulatory role under the CLM Act (Table 2). An absence of a site from the list does not necessarily imply the site is not contaminated.

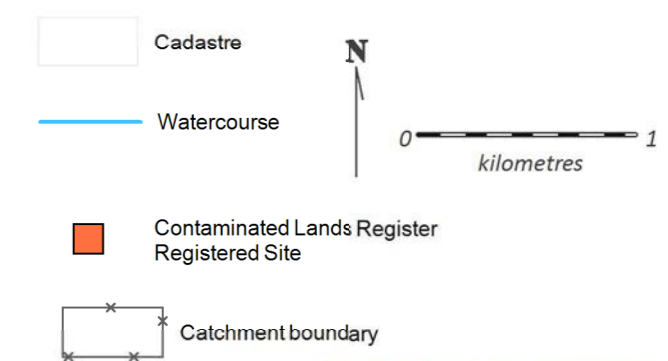
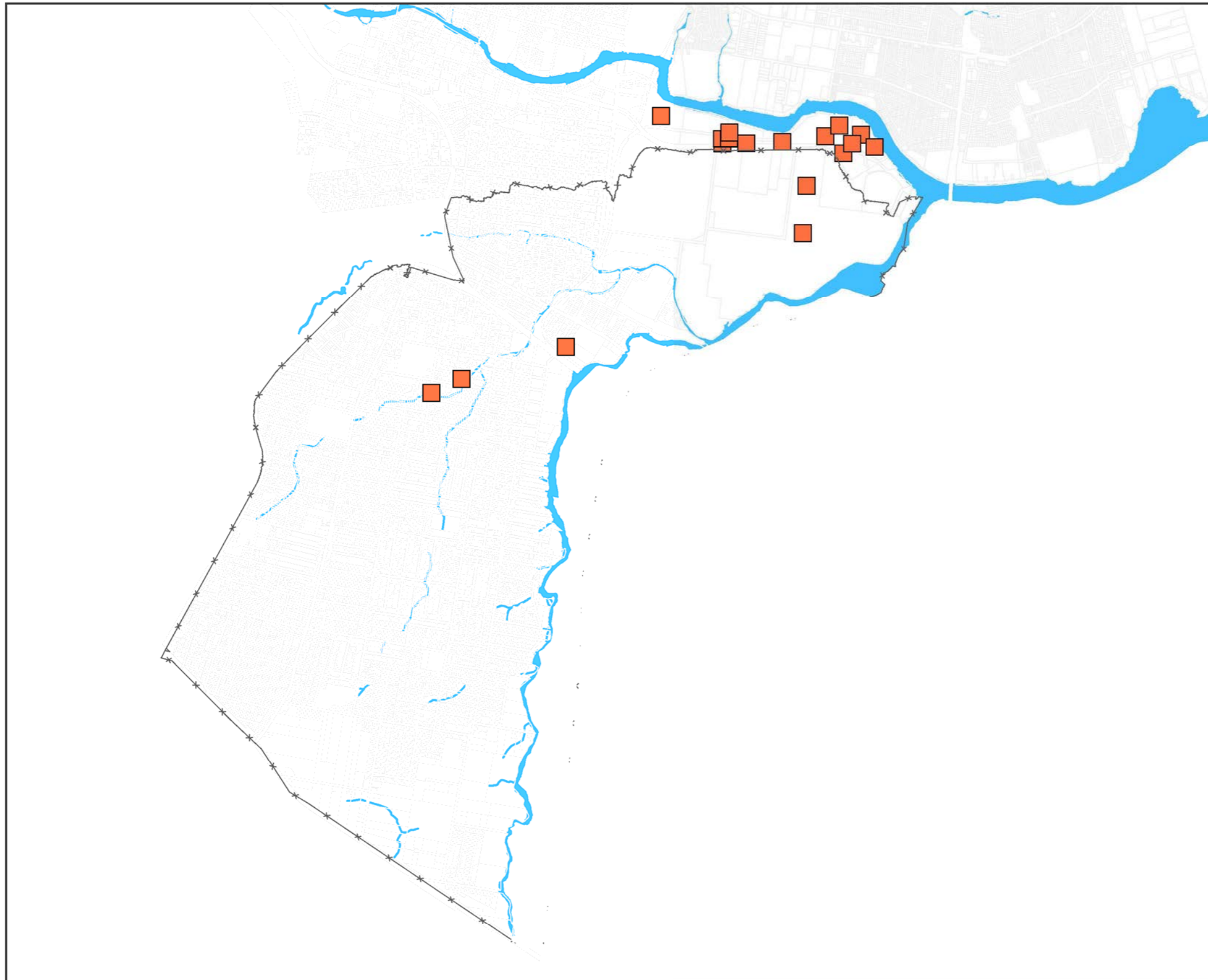
Table 4. EPA site management classes for sites notified to the NSW Contaminated Lands Register

EPA site management class	Explanation
A	The contamination of this site is being assessed by EPA. Sites which have yet to be determined as significant enough to warrant regulation may result in no further regulation under the <i>Contaminated Land Management Act 1997</i> .
B	EPA is awaiting further information to progress its initial assessment of this site.
C	The contamination of this site is or was regulated under the <i>Contaminated Land Management Act 1997</i> . Information about current or past regulatory action on this site can be found on the Record of EPA notices .
D	The contamination of this site is or was regulated under the <i>Protection of the Environment Operations Act 1997</i> . Information about current or past regulatory action on this site can be found on the POEO public register .
E	This is a premises with an operational underground petroleum storage system, such as a service station or fuel depot. The contamination of this site is managed under the <i>Protection of the Environment Operations Act 1997</i> and the <i>Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008</i> .
F	The contamination of this site is managed by a planning approval process. The consent authority is either the local council or a government agency, such as the Department of Planning.
G	Based on the information made available to EPA to date, the contamination of this site is considered by EPA to be not significant enough to warrant regulatory intervention.
H	Initial assessment completed. The contamination of this site is to be regulated by EPA.

Table 5. Excerpt from the NSW Contaminated Lands Register of sites that may impact on the overall health of Duck River catchment

Suburb/City	Site Description	Site Address	Activity that caused the contamination	s60 Form Received	OEH Initial Assessment	OEH Management Class
Auburn	Former Ajax chemical factory	9 Short Street	Other Industry	Yes	Completed	C
Auburn	Janyon	Manchester Road	Other Industry	Yes	Completed	G
Camellia	Akzo	6 Grand Avenue	Chemical Industry	No	Completed	C
Camellia	Asciano Properties	39 Grand Ave	Chemical Industry	No	Completed	C D
Camellia	Bitumen Manufacturer	12 Grand Avenue	Other Industry	No	Completed	C D
Camellia	Council Reserve	11B Grand Ave	Metal Industry	No	Completed	G
Camellia	Hambear	14 Thackeray St	Metal Industry	No	Completed	G
Camellia	Hymix Concrete	14 Grand Ave	Metal Industry	No	Completed	C
Camellia	James Hardie Factory (former)	1 Grand Ave	Other Industry	Yes	Completed	C
Camellia	Maritime Services Board	33A Grand Ave	Metal Industry	No	Completed	G
Camellia	Mauri Foods	15 Grand Ave	Other Industry	Yes	Completed	H
Camellia	Railway Land	27 Grand Ave	Other Industry	No	Completed	G
Camellia	Sydney Water	41 Grand Ave	Chemical Industry	No	Completed	C G
Camellia	Veolia	37 Grand Ave	Chemical Industry	No	Completed	C
Camellia	Wrigg	13 Grand Ave	Metal Industry	No	In progress	A
Granville	Australand	15-17 Berry St	Other Industry	Yes	Completed	F
Granville	Caltex Service Station	144 Parramatta Rd	Service Station	No	In progress	B
Granville	Evans Deacon Ind	2B Factory St	Other Industry	Yes	Completed	C
Granville	Mobil Service Station	154-160 Parramatta Road	Service Station	Yes	In progress	B
Granville	Old Granville Depot	23 Elizabeth Street	Unclassified	Yes	In progress	A
Rosehill	Camellia, Shell Clyde Refinery	9 Devon Street	Metal Industry	No	Completed	D
Rosehill	James Hardie	Devon Street	Other Industry	No	Completed	C
Rosehill	Shell Clyde Refinery	Durham St	Other Petroleum	No	Completed	D
Silverwater	Silverwater Landfill	Carnarvon Road	Landfill	Yes	Completed	H

CONTAMINATED SITES DUCK RIVER CATCHMENT PARRAMATTA LGA



file: Contaminated_Lands
date: 13/05/2012



CONSTRAINTS AND OPPORTUNITIES

Based on the information gathered to provide detailed mapping for the Duck River Catchment, an opportunities and constraints assessment was undertaken to identify current issues/problems, assets/strengths of each reach.

Table 6. Constraints and opportunities identified for reaches in the Duck River Catchment

ISSUE	CONSTRAINTS	OPPORTUNITIES	APPLIES TO REACH #
Quality of vegetation in remnant EECs	<ul style="list-style-type: none"> Generally small, with areas of good bush in highly degraded remnants Ongoing impacts from weeds higher in the catchment, or outside the riparian corridor Inappropriate use by visitors (eg. motorbikes, BMX, litter dumping, dogs off leash, faeces) Cultural support and acceptance for non local indigenous plant species 	<ul style="list-style-type: none"> Recreate and extend the riparian understorey and canopy. Restore complexity in vegetation, providing enhanced habitat resources Re-establish a vegetative corridor of appropriate density and complexity for full length of study area, providing potential fauna corridor Understorey management through bush regeneration programs 	Upper Duck River DR#1, DR#2, DR#3, DR#4, DR#5 Duck River Tidal DR#6, DR#7, DR#8 Smalls Creek SC#1, SC#2 Unnamed creeks UN#1, UN#2B, UN#3, UN#5, UN#6, UN#7, UN#9
Quality of other riparian vegetation	<ul style="list-style-type: none"> Significant areas of dense exotics and weeds Weeds and other exotics provide stability and habitat resources in some areas 	<ul style="list-style-type: none"> Staged removal programs in conjunction with supplementary habitat resources (eg nest boxes) provide ongoing habitat during weed control activities Better quality native habitat as a result of restoration activities provides resources for a wider range of native species 	Upper Duck River DR#1, DR#2, DR#3, DR#4, DR#5 Duck River Tidal DR#6, DR#7, DR#8 Duck Creek DC#4, DC#5 Little Duck Creek LDC#1A, LDC#1B, LDC#2, Smalls Creek SC#1, SC#2 Unnamed creeks UN#1, UN#2A, UN#2B, UN#3, UN#4, UN#5, UN#6, UN#7
Naturally functioning stream ecosystem	<ul style="list-style-type: none"> Bank stabilisation works may alter normal stream functions, including sediment deposition zones Significant bed lowering has resulted in disconnection of the stream from the surrounding floodplain area Significant sediment and nutrient loads are introduced from upstream areas Toxic sediments impact on downstream and tidal environments Tidal reaches function as estuarine ecosystems 	<ul style="list-style-type: none"> Manage woody debris as additional habitat resources Improve aquatic health through control of introduced fish species Supplementary plantings along waterway fringes, particularly in areas that are susceptible to erosion in peak flow events Improvements to riparian corridor vegetation, provision of additional habitat options, enhancements to recreational amenity 	Upper Duck River DR#1, DR#2, DR#3, DR#4, DR#5 Duck River Tidal DR#6, DR#7, DR#8 Duck Creek DC#4, DC#5 Little Duck Creek LDC#1A, LDC#1B, LDC#2 Smalls Creek SC#1, SC#2 Unnamed creeks UN#1, UN#2A, UN#2B, UN#3, UN#5, UN#6, UN#7, UN#9
Bank stability	<ul style="list-style-type: none"> Bank erosion is occurring following high flow events, and large quantities of sediments are mobilised Sediment transport can also carry weed propagules to areas downstream Toxic sediments from past industrial activities are becoming disturbed and mobilised when banks are destabilised Stormwater outlets create active erosion points in many places Steep banks with weed vegetation coverage experiencing toe failure require immediate attention 	<ul style="list-style-type: none"> Possible provision of pool and riffle systems (rock chutes and rock weirs) as part of streambank and channel bed stabilisation will provide improved habitat, water quality enhancement and improved amenity Stabilisation of streambanks will reduce sediment movement, improving flow behaviour and restricting transportation downstream Use properly positioned rootwads as a stabilisation technique where appropriate 	Upper Duck River DR#1, DR#2, DR#3, DR#4, DR#5 Duck River Tidal DR#6, DR#7 Duck Creek DC#4, DC#5 Little Duck Creek LDC#1, LDC#2 Smalls Creek SC#1, SC#2 Unnamed creeks UN#1, UN#2A, UN#2B, UN#3, UN#5, UN#6, UN#7, UN#9

ISSUE	CONSTRAINTS	OPPORTUNITIES	APPLIES TO REACH #
Flood behaviour	<ul style="list-style-type: none"> High proportion of impervious surfaces in the catchment has led to flashy storm flow events Time of concentration is rapid, peak flows occur quickly and at higher levels than would be normal stream behaviour Large quantities of litter and storm debris are transported and then deposited on vegetation, around in-channel piers, etc 	<ul style="list-style-type: none"> Improve management of peak flows in tributaries with alternating open channel and piped sections – options include provision of flood retardation basins Improve capacity for lateral connection between stream and surrounding floodplain by removing flood sensitive structures Improve management of litter to reduce impacts from deposition of storm debris 	Upper Duck River DR#1, DR#2, DR#3, DR#4, DR#5 Duck Creek DC#4, DC#5 Little Duck Creek LDC#1, LDC#2 Smalls Creek SC#1, SC#2 Unnamed creeks UN#1, UN#2A, UN#2B, UN#3, UN#5, UN#6, UN#7, UN#9
Water quality	<ul style="list-style-type: none"> Highly urbanised catchment is a constant source of litter in stormwater High nutrient load generated in the immediate catchment and in upstream areas Erosion leading to sediment mobilisation affects water quality Carp populations feed on bottom sediments and constantly disturb and mobilise sediments and toxic material Fertilisers and herbicide are used regularly on sporting grounds surrounding the river corridor 	<ul style="list-style-type: none"> Streambank stabilisation and erosion control will reduce sediment loads Reduction in scouring through management of storm flows and removal of carp will reduce mobilisation of toxic sediments Improved collection of litter and storm debris at stream inflow points Education of grounds managers for sporting facilities to minimise the use of fertilisers and herbicides Liaison with Bankstown City Council to better manage the quality of stream flows entering this part of the catchment 	Upper Duck River DR#1, DR#2, DR#3, DR#4, DR#5 Duck River Tidal DR#6, DR#7, DR#8 Duck Creek DC#1, DC#2, DC#3, DC#4, DC#5 Little Duck Creek LDC#1, LDC#2, LDC#3, LDC#4 A'Becketts Creek ABC#1, ABC#2 Smalls Creek SC#1, SC#2 Unnamed creeks UN#1, UN#2A, UN#2B, UN#3, UN#4, UN#5, UN#6, UN#7, UN#8, UN#9
Width of riparian corridor	<ul style="list-style-type: none"> For many of the smaller tributaries there is urban development within several metres of the normal water's edge In other parts of these tributaries open space parks occupy the riparian corridor In the main channel development is largely excluded from the immediate riparian area Width of buffer allocated to riparian vegetation is often limited to 10-15m, outside this is grassed open space for sporting activities 	<ul style="list-style-type: none"> Revegetation in the main channel should include expansion of riparian buffer by planting to extend existing EEC vegetation Revegetation in smaller tributaries should include expansion of riparian buffer through planting of canopy species that provide habitat resources without compromising the open space atmosphere Some locations where buyback of riparian buffer should be considered 	Upper Duck River DR#1, DR#2, DR#3, DR#4, DR#5 Duck River Tidal DR#6, DR#7, DR#8 Duck Creek DC#1, DC#2, DC#3, DC#4, DC#5 Little Duck Creek LDC#1, LDC#2, LDC#3, LDC#4 A'Becketts Creek ABC#1, ABC#2 Smalls Creek SC#1, SC#2 Unnamed creeks UN#1, UN#2A, UN#2B, UN#3, UN#4, UN#5, UN#6, UN#7, UN#8, UN#9
Land tenure for stream channel	<ul style="list-style-type: none"> Large parts of many tributaries are concrete-lined trapezoidal drains owned and managed by Sydney Water as part of their stormwater management assets Channels are managed to maintain their existing condition 	<ul style="list-style-type: none"> Limited opportunities for improvement of ecosystem health or habitat resources associated with concrete lined channels No likelihood of "naturalisation" of these channels due to spatial constraints Handover of channels from Sydney Water to Parramatta Council would require a major outlay of capital expenditure just to maintain their existing condition 	Duck Creek DC#1, DC#2, DC#3, DC#4 Little Duck Creek LDC#3, LDC#4 A'Becketts Creek ABC#1 Unnamed creeks UN#1, UN#2A, UN#2B, UN#3, UN#4, UN#5, UN#6, UN#7, UN#9

ISSUE	CONSTRAINTS	OPPORTUNITIES	APPLIES TO REACH #
Land tenure for riparian corridor	<ul style="list-style-type: none"> Some areas of private land ownership in the main channel Many areas of private land ownership in the main tributaries significantly limit options for improving riparian extent and condition 	<ul style="list-style-type: none"> Consider buyback scheme or joint management plans with major industrial landholders, including Shell Refinery, Australia Post and others 	Upper Duck River DR#5 Duck River Tidal DR#7, DR#8
Access and recreation	<ul style="list-style-type: none"> Impacts on understorey and canopy continuity from informal pedestrian, bicycle and motorbike access Continued need for mowing of open space areas, impacting on riparian corridor edge and damaging native grasses Potential public safety issues in areas with dense understorey Potential for damage to important cultural heritage items if location known and access improved 	<ul style="list-style-type: none"> Create interesting pedestrian and shared cycle circular paths around the Upper Duck River Wetlands riparian corridor provide link to existing pathways and resources on both sides of the river Provide educative and interpretive signage to highlight the importance of rehabilitation and maintenance activities. Create educational opportunities associated with the main wetlands and riparian corridor Identification and protection for important heritage items 	Upper Duck River DR#1, DR#2, DR#3, DR#4, DR#5 Duck River Tidal DR#6, DR#7, DR#8 Smalls Creek SC#2 Unnamed creeks UN#3, UN#5, UN#6, UN#7, UN#9
Introduced animals	<ul style="list-style-type: none"> Carp are destructive to stream banks and disturb stream bed sediments; outcompete native species for food and habitat resources Gambusia are aggressive and very competitive species, predating tadpoles of native frog species Introduced ducks and geese reduce food resources and defecate into the stream, contributing to poor water quality Feral cats are implicated in predation of native birds and small marsupials 	<ul style="list-style-type: none"> Community information activities could include carp fishing as a way of reducing their numbers in the main channel, and education about the dangers of consuming fish caught in Duck River Public education should include the damage done by introduced ducks and geese Feral cats and uncontrolled domestic cats need to be controlled through a cat trapping program in conjunction with a cat curfew and micro-chipping program 	Upper Duck River DR#1, DR#2, DR#3, DR#4, DR#5