

PERTH & KINROSS COUNCIL



PKC SUDS Biodiversity Review and Report

A Study of Mitigation

Andrew Law, August 2015



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Tayside Biodiversity Partnership



BIODIVERSITY
THE VARIETY OF LIFE

With habitat loss a significant contributor to recent global amphibian declines the requirement for Sustainable Urban Drainage Systems (SUDS) in new developments has the potential to provide a valuable new resource to halt the decline. Perth and Kinross Council has over 150 SUDS of which over half are pond or above ground water retention systems which could be used by amphibians as habitats. Of these 32 were found to have the right conditions for habitats on inspection 9 were found to actually host amphibians.

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Introduction

SUDS (Sustainable Urban Drainage Systems) are an integral part of many new builds within the council boundaries. The Water Environment & Water Services (Scotland) Act 2003 makes the installation of SUDS compulsory in new developments. The Nature Conservation (Scotland) Act 2004 places a duty on every public body (local authorities, SEPA, Scottish Water, etc.) to “further the conservation of biodiversity”. These two pieces of legislation have the power to vastly improve the biodiversity value of SUDS, swales, etc. if they are managed specifically with biodiversity in mind.

SUDS are defined as “a sequence of management practices and control systems designed to drain surface water in a more sustainable manner than some conventional techniques” (CIRIA, 2000). The aim is to more closely replicate a sites natural drainage and remove pollutants before they reach watercourses. However, many SUDS can offer some other public and environmental aids by cultivating biodiversity and open spaces within the urban setting (Wilson, et al., 2004). For local residents this may help reduce stress and mental fatigue that can ensue in developed areas (Velarde, et al., 2007). There is also another side to SUDS which is rarely utilised and this is the management of SUDS as a resource for biodiversity. Although not all SUDS are built or used in a way that is useful for wildlife, areas such as detention basins, swales and SUDS ponds are all good, often sheltered, areas where a wide variety of wildlife can inhabit and populations expand. These SUDS can also be used to connect other landscape features and are very important wildlife corridors, allowing the movement of animals across areas where it is less likely they will encounter people or be a danger on roads.

Perth and Kinross Council have over 150 SUDS within their boundaries of which almost half are pond or above ground water retention systems, which could be used by amphibians as habitats. This has been broadly accepted by the Council who, through their Roads Department, have agreed to install wildlife kerbs on roads which are undergoing works near to SUDS sites and amphibian migration routes. These kerbs can be very helpful in avoiding the trapping and drowning of small mammals and amphibians which, as well as driving up mortality and decreasing local populations, possibly to dangerous national levels, also helps in keeping the gullypots unblocked and working properly.

Materials and Methods

SUDS Identification

Given no similar study of the SUDS in Perth and Kinross Council had been carried out, the first task was to identify all of the SUDS within the Council boundaries, together with their locations. This was a desk study which was made easier by the previous work done by the council cataloguing the locations, owners and, in most cases, type of SUDS. (Law, 2014). The desk study included a review of the most recent OS maps within the Councils GIS systems as well as the use of the planning department’s records to identify the more recent developments, the latter study including several which have not started yet such as the Bertha Park Development. Legislation for SUDS was first introduced with the Water Environment Water Services (Scotland) Act 2003, which gave Scottish Ministers powers to introduce regulatory controls over water activities, in order to protect, improve and

promote sustainable use of Scotland’s water environment. This included wetlands, rivers, lochs, transitional waters (estuaries), coastal waters and groundwater. There is no archive database for SUDS developments from before 2005 as this was when SUDS became a legal requirement (Water Environment (Controlled Activities) (Scotland) Regulations 2005). This means records from before 2005, if there are any, are difficult to find on online record systems within the Council. However, carrying forward the ideas from the review, a more comprehensive list of the SUDS was compiled with only those deemed impossible to sustain amphibian populations (underground pipes, porous paving and attenuation tanks) not surveyed.

Habitat Assessment

Once identified, each site was surveyed with a general description of the site, a physical characterization and visual water quality assessment, and a visual assessment of riparian habitat and quality. For each site one visit was carried out in July. This is when there has been shown to be the most evidence of amphibians, and especially their movements, in the Perth and Kinross area (Muir, 2010) and (Law, 2014).

Results

Habitat Assessments

Of the SUDS which were deemed suitable for use by amphibians (with the above restrictions), 32 were found to currently have the right conditions for habitats to be improved or managed specifically for this purpose and of those 32, 9 were found to actually host amphibians upon a quick visual inspection of the drains nearby. Many of the sites were found to be in differing states of use and habitation including habitable land. A full overview of each SUDS checked can be found within the appendix; however the ones which are in need of action, whether immediately or in relation to future developments are:

Id	LOCATION	TOWN	TYPE	Migration Route
2	B867 ENTRANCE TO BANKFOOT BY A9 AT HILTON BUNGALOW	BANKFOOT	WET	Possible
3	C408 BANKFOOT UNDERPASS BY A9	BANKFOOT	WET	Definite
4	THE GLEBE BY NUMBER 20 AT BALB BURN	ABERNETHY	WET	Likely
5	BRANDYWELL ROAD AT NEWBURGH ROAD	ABERNETHY	WET	Likely
6	GLASGOW ROAD FLOOD ALLEVIATION POND WEST	PERTH	WET	Definite
7	GLASGOW ROAD FLOOD ALLEVIATION POND EAST	PERTH	WET	Definite
8	NORTH INCH GOLF COURSE BY CAMPUS	PERTH	WET	Definite
12	DWELLING AT GARRY BURN	BANKFOOT	DRY	Likely
13	SCOTTISH LIQUEUR CENTRE	BANKFOOT	DRY	Definite
17	SMIDDY COTTAGE	CLEISH	WET	possible
22	GOWRIE QUARRY	STANLEY	WET	Likely
24	GLASGOW ROAD, 10 HOUSES	PERTH	WET	Possible
33	DUSTIE WAY - OUDENARD	BRIDGE OF EARN	DRY	Possible
35	ABERCAIRNEY CLOSE	BLACKFORD	WET	Likely
39	RAWES FARM	LONGFORGAN	DRY	Possible
42	BY SHERIFMUIR CLOSE	GREENLOANING	WET	Definite
47	CAMSERNEY COTTAGE 30m SE	CAMSERNEY	WET	Likely

56	MILTON COTTAGE	LAWERS	?	Likely
57	DUNKELD ROAD	BANKFOOT	WET	Possible
61	TAYLOR AVENUE	METHVEN	WET	Possible
63	MAIDENPLAIN STEDDING	CARNBO	WET	Possible
80	MUIRMONT CRESCENT	BRIDGE OF EARN	DRY	Possible
83	CULTEUCHAR ROAD	ARDARGIE	WET	Definite
91	STELL PARK ROAD	BIRNAM	WET	Likely
92	WAUKMILL DRIVE	BLACKFORD	DRY	Likely
93	ACCESS OFF BERRYDALE LEADING TO CAMPUS	BLAIRGOWRIE	WET	Definite
100	INCHBRAKIE DRIVE	CRIEFF	WET	Likely
108	CLATHYMORE DRIVE, CLATHYMORE	TIBBERMORE	WET	Definite
113	MIDDLETON PARK	KELTYBRIDGE	WET	Possible
116	BURNBANK MEADOWS	KINROSS	DRY	Possible
130	CLEEVE PARK	PERTH	DRY	Unlikely
132	COLDSTREAM AVENUE	PERTH	WET	Possible
69	A9/A85 JUNCTION UPGRADE	PERTH	WET	Likely
69	A9/A85 JUNCTION UPGRADE	PERTH	DRY	Likely
	(New Development) Bertha Park Project	PERTH	WET	Very Likely

Those labelled “Definitely” are those of which there has been visual confirmation of habitation. Those labelled “Likely” are SUDS in which no amphibians were confirmed - however the area is well suited to habitation. Those labelled “Possible” are SUDS which have the potential to be habitable with some input. Further details of each site can be found in the appendix.

Discussion

SUDS Identification

At the time of the study it is believed that all of the SUDS ponds within Perth and Kinross Council were identified however, as discussed in the methods, some sites may have been missed.

Information from similar reports on SUDS shows that if regular upkeep is not upheld it is increasingly likely that the ponds will silt up or become blocked, thereby increasing the risk of flooding (Rae, 2015), instead of doing what they were designed for in decreasing the risk. Recommendations for maintenance can be found via the "CIRIA" or "Susdrains" websites, www.ciria.org/ and www.susdrain.org/index.html respectively, and in The SUDS Manual, which can be found at www.ciria.org/Resources/Free_publications/the_suds_manual.aspx on the CIRIA website.

Amphibian Populations

Of the 32 sites found to be suitable, 9 were found to host amphibians, including Toads and Newts, upon a quick visual inspection of the drains nearby. This means there were certainly more SUDS where amphibians were present but unaccounted for. It is suggested that further, voluntary, surveying is carried out within all of the above listed SUDS with the application of mitigation in those with which there are nearby drains which will increase the rate of entrapment and unnatural death.

Conclusions

The recent survey of SUDS within PKC has shown that there are many SUDS both within Perth and further afield, which could, with very little effort, be turned into wildlife havens. This would go a long way to helping meet the Council's mandated Biodiversity Duty under the Nature Conservation (Scotland) Act 2004. Some projects have already been either attempted or fully carried out within the council through the Ranger Service and there is a proposal in the 2nd Edition Tayside Biodiversity Action Plan that a series of Community Pond Projects is set up to enhance relevant SUDS. It is hoped that additional SUDS within Perth & Kinross which would not be suitable for community input could be managed with wildlife in mind. It is therefore recommended that the implementation of SUDS designed for wildlife and flood risk rather than solely for flood risk is undertaken by the council and companies whose responsibility it is to create SUDS ponds within the local infrastructure.

Several studies have also been published showing the huge effects of entrapment in drains of wildlife including amphibians and small mammals which number in the hundreds over the course of a single year. These reports can be found at www.taysidebiodiversity.co.uk/ under the TayARG section. A list of all the SUDS in Perth and Kinross is supplied within the Appendix with those with additional information being those which have been surveyed.

Acknowledgements

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Bibliography

CIRIA, 2000. *Sustainable urban drainage systems design manual for Scotland and Northern Ireland*.. London: CIRIA.

Law, A., 2014. *Amphibians in Drains Report 2014*, Perth: Tayside Biodiversity Partnership, Perth and Kinross Ranger Service.

Muir, D., 2010. *Amphibians in Drains Report 2010*, Perth: Perth and Kinross Ranger Service.

Muir, D., 2011. *Amphibians in Drains 2011*, Perth: Perth and Kinross Ranger Service.

Rae, M., 2015. *Inverness SUDS Initial Report*, Inverness: Highland Council.

Velarde, M., Fry, G. & Tveit, m., 2007. Health effects of viewing landscapes – Landscape types in environment psychology.. *Urban Forestry and Urban Greening*, 6 (4), pp. 199-212.

Wilson, S., Bray, R. & Cooper, P., 2004. *Sustainable Drainage Systems*.. London: CIRIA.

Appendix

Id	USRN	LOCATION	TOWN	TYPE	COMMENTS	Migration Route	Habitat assessment (Standards - water filled/wildlife friendly/grass growth?)	Nearby Gullypots/kerbs/new dev. /busy road/ponds etc. Ladders?
1	30005775	AULD BOND ROAD BY GLENTURRET PLACE	PERTH	DRY				
2	30006291	B867 ENTRANCE TO BANKFOOT BY A9 AT HILTON BUNGALOW	BANKFOOT	WET		Possible	Porous inflow from A9 through large space percolation.	Busy road with the Liqueur centre nearby. Nothing needed
3	30005091	C408 BANKFOOT UNDERPASS BY A9	BANKFOOT	WET		Definite	A9 SUDS. No standing water present. Surrounded by fields and a small water course to the east.	Amphibians spotted, Ladders recommended.
4	30006959	THE GLEBE BY NUMBER 20 AT BALBURN	ABERNETHY	WET		Likely	Good habitat, well-kept SUDS. Gardens surrounding as well as fields. Long grasses and reeds etc. in the SUDS	Drains present, ladders suggested.
5	30007085	BRANDYWELL ROAD AT NEWBURGH ROAD	ABERNETHY	WET		Likely	Good size SUDS. Needs planting of useful plants to remove excess nutrients.	Ladders suggested for all nearby. Amphibians spotted trapped.
6	30005762	GLASGOW ROAD FLOOD ALLEVIATION POND WEST	PERTH	WET		Definite	Land for sale for development with SUDS part of contract.	Not yet built - pond, soakaway and porous paving suggested.
7	30005762	GLASGOW ROAD FLOOD ALLEVIATION POND EAST	PERTH	WET		Definite	Land for sale for development with SUDS part of contract.	Not yet built - pond, soakaway and porous paving suggested.
8	30007166	NORTH INCH GOLF COURSE BY CAMPUS	PERTH	WET		Definite	Very good, water filled SUDS. Shallow and slow moving water with good cover. Surrounded by golf course and parkland.	No nearby kerbs. Mitigation not needed.
9	30005567	UPPER TILLYRIE	MILNATHORT	DRY	Detention Basin			
10	30007288	KINTILLO ROAD AT ELM COURT	BRIDGE OF EARN	DRY	Porous Paving/Filter Trench			
11	30001991	DUNKELD ROAD BY ARNPRIOR	BANKFOOT	?	Underground storage pipes			
12	30006999	DWELLING AT GARRY BURN	BANKFOOT	DRY	Soakaway	Likely	Some standing water, removed from road, could be secluded for wildlife corridor.	

13	30006291	SCOTTISH LIQUEUR CENTRE	BANKFOOT	DRY	Filter drain/soakaway	Definite	SUDS are planted with medium sized plants to provide some cover as well as being a good area for wildlife along the A9 wildlife corridor. Sloped kerbs could also be implemented along both Bankfoot road and along the A9 to minimise entrapment of small wildlife while they move across the roads.	A9 Gullypots and Road into Bankfoot Gullypots. Ladders Recommended.
14	30004276	NETHER KIRKTON FARM, KIRKTON	MEIKLEOUR	DRY	Soakaway			
15	30006117	2 FEUS, WINDSOLE	AUCHTERARDER	?	Detention Basin (None currently installed)			
16	30007708	MAWCARSE FARM	MILNATHORT	?	Ditch/Soakaway/Swale (none currently installed)			
17	30007636	SMIDDY COTTAGE	CLEISH	WET	Storm Soakaway	possible	A large wet soakaway which can be used to take unwanted farm nutrients from runoff before reintroducing it into the water table. The high nutrients would allow for abundant plant growth providing cover or shelter for habitats.	Gullypots nearby on B9097 (Colonel Burn)
18	30007690	TRAVELLERS PITCHES	BLAIRADAM	DRY	Soakaway			
19	30005566	TILLYOCHIE FARM (3 HOUSES)	BALADO	DRY	Soakaway			
20	30007641	CARNBO FARM	CARNBO	DRY	Soakaway/Filter Trench into existing stream			
21	30007466	PUMP HOUSE	BRIDGE OF CALLY	DRY	Soakaway (to rear of property)			
22	30007494	GOWRIE QUARRY	STANLEY	WET	Soakaways/Infiltration Trench/ SUDS Pond/ Underground Storage	Likely	Good surrounding habitat with small coppices of woodland. Natural regrowth. Suggested planting native species/trees etc. and cleaned. Hunting ground for swallows, sand martins, dragonflies and herons.	No nearby kerbs. Mitigation not needed.
23	30001094	DUFF AVENUE	MOULIN	DRY	Gravel and Hardcore Soakaway			
24	30005762	GLASGOW ROAD, 10 HOUSES	PERTH	WET	Flood Attenuation Ponds x 1	Possible	Wildlife friendly, short grass leading to burn walk	Gullypots nearby on estate roads. Ladders recommended.
25	30005035	WOODLANDS (WEST)	PERTH	?	Flood Attenuation Ponds x 2			
26	30002600	MEADOWVIEW DRIVE	INCHTURE	WET	Detention Basin			

27	30007888	DALL HOUSE DEVELOPMENT	DALL					
28	30005684	HILTON OF DUNCREIVIE, DUNCREIVIE	GLENFARG	DRY	Detention Basin			
29	30007869	REDSTONE FARM BY WOLFHILL	BURRELTON	DRY	Partial Soakaway/ Filter Trench			
30	30007499	BOATLAND, BALLATHIE	MURTHLY	DRY	Soakaway			
31	30007401	RESERVOIR BUILDING, BLAIRGOWRIE ROAD	DUNKELD	DRY	Soakaway to south of building			
32	30007159	ABBAY LANE, GRANGE	ERROL	WET	3 Detention Basins - Scotia Homes			
33	30007695	DUSTIE WAY - OUDENARD	BRIDGE OF EARN	DRY	SUDs Pond/Dry Detention Basin	Possible	Massive flood retention pond. This dry retention pond is likely to be dry for most of the year and could therefore be used for local wildlife planting, sustaining the natural corridor. As it is in close proximity to the motorway the biodiversity management would need to focus on invertebrates such as dragonflies and bumblebees to ensure it does not prove hazardous to vehicles from larger wildlife.	Only on motorway - unlikely to be a migration route
34	30002137	OLD EDINBURGH ROAD	BRIDGE OF EARN	DRY	Soakaway in each properties garden			
35	30006846	ABERCAIRNEY CLOSE	BLACKFORD	WET	Detention Basin	Likely	Water present, field surrounding as well as play parks and gardens. New housing estate surrounding likely expansion.	Drains present, ladders suggested.
36	30006605	LUNDIES WALK	AUCHTERARDER	WET	Detention Basin			
37	30007636	CLEISH MILL	CLEISH	DRY	Soakaway in neighbouring field			
38	30004933	BALNAD FARM	FORTINGAL	DRY	Filter Trench			
39	30007727	RAWES FARM	LONGFORGAN	DRY	Yes needed but no details	Possible	Low habitat possibility - short monoculture grass growth	Few on road, possible migration route
40	30005426	MYRESIDE FARM	PITRODDIE	DRY	Yes but no details			
41	30005874	FORMER PERTH AUCTION MART	EAST HUNTINGTOWER	?	Detention Basin (not built)			
42	30005518	BY SHERIFMUIR CLOSE	GREENLOANING	WET	Detention Basin	Definite	Water present, field surrounding as well as play parks and gardens. New housing estate surrounding. Next to two main roads	Ladders suggested for all nearby. Amphibians spotted trapped.

43	30002639	TREE BACK	MEIGLE	DRY	Soakaway			
44	30006955	SCHOOL LOAN	CROFTINLOAN	DRY	Two sand filters and soakaway land			
45	30005028	MURRAY ROYAL HOSPITAL	PERTH	?	Filter Trenches/ Porous Paving. (not built)			
46	30001905	RORRIE TERRACE	METHVEN	DRY	Attenuation Tanks, Porous Paving and Filter Trenches			
47	30007304	CAMSERNEY COTTAGE 30m SE	CAMSERNEY	WET	Internal Swales/ Filter Traps	Likely		No nearby kerbs or drains. Mitigation not needed.
48	30007875	FISHING HUT BY CRAIGHALL BRIDGE	BLAIRGOWRIE	DRY	Soakaway			
49	30005218	FORMER BUNRANNOCH HOTEL SITE	KINLOCH RANNOCH	DRY	Porous Paving/Chips			
50	30007593	KIRKTON	TRINITY GASK	DRY	Detention Basin			
51	30007837	CRATHIES BRIDGE HOUSE	MEIGLE	DRY	Yes but no details			
52	30007355	THE OLD DISTILLERY	BALLECHIN	DRY	Soakaway			
53	30004188	AYTON FARM	ABERARGIE	DRY	Filter Trench			
54	30007347	TAYCLADDOCH FARMHOUSE	GRANDTULLY	DRY	Swale			
55	30007517	NE OF BARVICK	CRIEFF	DRY	3 Soakaways per House + 1 Garage			
56	30007321	MILTON COTTAGE	LAWERS	?	SUDS recommended but no details		Not yet built. As of 8/15	No nearby kerbs or drains. Mitigation not needed.
57	30001991	DUNKELD ROAD	BANKFOOT	WET	SUDS recommended but no details	Possible	The SUDS is removed from the road down a hill next to prime small mammal and amphibian feeding grounds and near a woodland wildlife corridor. Could be planted to provide more cover and increase biodiversity.	Dunkeld road nearby, ladders recommended.
58	30001941	BIRNAM AUTOPOINT, PERTH ROAD	BIRNAM	DRY				
59	30007676	CRAIGTON FARM (POWMILL)	POWMILL	DRY				
60	30000716	DUNTAYLOR AVENUE	ABERFELDY	DRY				

61	30008399	TAYLOR AVENUE	METHVEN	WET	not yet finished	Possible		Recommended porous paving, drainage ditches. Ladders in drains.
62	30004792	HAUGH ROAD	RATTRAY	DRY				
63	30007601	MAIDENPLAIN STEADING	ABERUTHVEN	?				
64	30002222	STATION ROAD	MURTHLY	DRY				
63	30008443	MAIDENPLAIN STEDDING	CARNBO	WET		Possible	Next to a new development. Wildlife Kerbs could be implemented here to great effect as on either side of the development there are areas being used as SUDS including a drainage ditch and a wet soakaway.	
64	30007227	JUNCTION ROAD	KINROSS	WET				
65	30000630	ISLA ROAD - FORMER NURSING HOME	PERTH	DRY				
66	30008430	SCHOOL FIELD ROAD	RATTRAY	DRY				
65	30008433	DAVID FARQUHARSON ROAD	BLAIRGOWRIE	DRY				
66	30008454	STEADING PLACE	MEIGLE	?				
67	30007708	MAWCARSE STEADING	MILNATHORT	?				
68	30002230	WHITECRAIGS	KINNESSWOOD	?				
69	30004169	A9/A85 JUNCTION UPGRADE	PERTH	DRY	Soakaway/Dry Ditch			
70	30000450	OAKBANK ROAD - PERTH HIGH SCHOOL NEW SPORTS PITCH	PERTH	DRY				
71	30005929	MAIN ROAD	DUNCRIVIE	DRY				
72	30005968	MILNATHORT GOLF CLUB	MILNATHORT	?	Not yet Built			
73	30005862	THE OLD SCHOOL HOUSE	COTTOWN	DRY				
74	30000808	SPRINGBANK ROAD	ALYTH	DRY				
75	30006855	INVER BRAAN	LITTLE DUNKELD	DRY				
76	30007363	BEAUFORT	CLEISH	DRY				
77	30002169	PITDOWNIE FARM, MANSE ROAD	MILNATHORT	?	Not yet built			
78	30001232	ABBAY ROAD 80m W OF No 22	AUCHTERARDER	DRY				

79	30007292	THE LITTLE CHAPEL	KILLICHONAN	DRY				
80	30004814	MUIRMONT CRESCENT	BRIDGE OF EARN	DRY		Possible	Dry swale is next to the motorway and directly opposite community woodland making it a prime spot for wildlife. This swale could be turned into a small sanctuary for wildlife and act as part of a wildlife corridor.	
81	30007253	GRAEMESLEA VIEW	ABERUTHVEN	WET				
82	30006128	HALL ROAD	ABERUTHVEN	WET				
83	30006057	CULTEUCHAR ROAD	ARDARGIE	WET	SUDS Pond	Definite	Large SUDS surrounded by forest, housing and gardens as well as fields. High amounts of diversity surrounding healthy ecosystem and possibly supports small fish. Plenty of sheltered freshwater plant areas	Entrapment witnessed. Ladders recommended.
84	30007083	FRANKLIN STREET	ARDLER	DRY				
85	30001234	FEUS	AUCHTERARDER	WET				
86	30001212	RUTHVEN STREET	AUCHTERARDER					
87	30001208	NEW SCHOOL LANE	AUCHTERARDER	DRY			Likely to be a good population of beneficial invertebrates. This could be managed, perhaps with planting of reeds, providing cover and shelter for small mammals and amphibians.	
88	30008460	U189 BARDILL ROAD BY PETERHEAD	GLENEAGLES	WET				
89	30009191	POWSIDE DRIVE, BALGOWAN	TIBBERMORE	DRY	Porous paving			
90	30006870	BALLACHALLAN	BALLINLUIG	?				
91	30001944	STELL PARK ROAD	BIRNAM	WET		Likely	SUDS surrounded by trees with gardens nearby. Likely a wildlife corridor.	Dropped kerbs with few drains - Ladders Suggested.
92	30006851	WAUKMILL DRIVE	BLACKFORD	DRY	Porous paving	Likely	Estate likely to be a migration route.	Kerbs suggested for parts not yet finished, ladders for finished areas.
93	30007971	ACCESS OFF BERRYDALE LEADING TO CAMPUS	BLAIRGOWRIE	WET	SUDS Pond	Definite	Elm Drive SUDS. Grass and parkland surrounding SUDS with nearby ponds. Long grass with much suitable habitat.	Wildlife kerbs already implemented. Ladders suggested.
94	30000929	COUPAR ANGUS ROAD	BLAIRGOWRIE	DRY				
95	30006476	BIRCH AVENUE	BLAIRGOWRIE	DRY				
96	30007131	RIVERSIDE PARK	BLAIRGOWRIE	DRY				

97	30002116	UDENARDE FARM, CLAYTON ROAD	BRIDGE OF EARN	WET	Pond and pumping station			
98	30007233	ALEXANDER DRIVE	BRIDGE OF EARN	DRY				
99	30001053	MAIN ROAD	WOODSIDE	DRY				
100	30001305	INCHBRAKIE DRIVE	CRIEFF	WET	Water retention pond.	Likely	Water present, field surrounding as well as play parks and gardens. New housing estate surrounding likely expansion.	Drains present, ladders suggested.
101	30007072	SKYE CRESCENT	CRIEFF	DRY				
102	30001245	ALLIGAN ROAD	CRIEFF	DRY				
103	30006203	STATION ROAD	COUPAR ANGUS	DRY				
104	30007725	THE GRANGE	ERROL	WET				
105	30005868	THE GRANGE	ERROL	WET				
106	30007158	MONKS WALK, GRNGE	ERROL	WET				
107	30007159	ABBAY LANE, GRANGE	ERROL	WET				
109	30006861	CUTHILL TOWERS	GLENFARG	DRY				
108	30007140	CLATHYMORE DRIVE, CLATHYMORE	TIBBERMORE	WET	SUDs Pond/Dry Detention Basin	Definite	Flood retention basin, mostly dry. Few nearby sources of groundwater	Dropped kerbs with few drains - Ladders Suggested.
110	30006084	MILLHILL	GREENLOANING	WET			See Sheriffmuir close.	
111	30006978	ORCHARD WAY	INCHTURE	WET				
112	30005816	ALASTAIR SOUTAR CRESCENT - BULLIONFIELD MILL	INVERGOWRIE	DRY	Soakaway/Dry Ditch			
113	30007128	MIDDLETON PARK	KELTYBRIDGE	WET	SUDs Pond/Dry Detention Basin	Possible	Dry flood retention basin, well maintained with good habitat surrounding.	No kerbs. No work needed,
114	30007235	BURN BANK	KETTINS	DRY				
115	30007818	KEILLOUR FARM	KETTINS	DRY				
116	30007203	BURNBANK MEADOWS	KINROSS	DRY		Possible	Scottish Water and PKC run raised Swale which could be used in a community or school project for habitat or biodiversity expansion, making this a prime spot for small mammals, amphibians and insects such as (dragonflies, bumblebees??).	
117	30001459	STATION ROAD	KINROSS	DRY				
118	30004844	CLASHBURN ROAD, BRIDGEND INDUSTRIAL ESTATE	KINROSS	WET				
119	30002703	WESTBANK STEADING, MAIN	LONGFORGAN	?	none			

		STREET						
120	30007727	RAWES FARM	LONGFORGAN	?	None			
121	30001902	LYNEDOCH ROAD	METHVEN	DRY	Dry soakaway and filtration ditch			
122	30008370	TILLYRIE MAINS	MILNATHORT	DRY				
123	30006235	KINCLAVEN ROAD (NINEVAH)	MURTHLY	WET				
124	30006236	DRUIDS PARK	MURTHLY	DRY				
125	30000118	GLENEAGLES ROAD	PERTH	DRY				
126	30006550	CORNHILL WAY/FAIRIES ROAD	PERTH	DRY				
127	30005775	AULD BOND ROAD	PERTH	DRY				
128	30005000	ST CATHERINES ROAD	PERTH	DRY				
129	30000450	OAKBANK ROAD	PERTH	?				
130	30000368	CLEEVE PARK	PERTH	DRY		Unlikely	Community wildflower garden and burn hydrobreak. This currently plain and grassy area could be transformed through community gardening into a beautiful wildflower area.	
131	30007199	SIMPSON SQUARE	PERTH	WET				
132	30005796	COLDSTREAM AVENUE	PERTH	WET		Possible	Community SUDS/woodland/corridor/amphibians. This SUDS area is dry at one side and is wetter closer to the burn. This could be cleared and replanted with an attractive mix of wildflowers, possibly with a reed-bed pond and small path or wet grassland.	
133	30004997	TULLOCH HILL	PERTH	DRY				
134	30007696	SAVILL ROAD	BRIDGE OF EARN	DRY				
135	30007696	SAVILL ROAD/DUSTIE WAY	BRIDGE OF EARN	DRY				
136	30000621	GOWANS TERRACE AT ST JOHNS ACADEMY	PERTH	DRY				
137	30007885	BY AN CARRANNACH OFF C503 BY CROFTINLAN	BALLYOUKAN	DRY				
138	30006717	MAIN ROAD - BRAEHEAD FARM	RUMBLING BRIDGE	DRY				
139	30007939	BALGARVIE FARM	SCONE	DRY				
140	30006640	STATION ROAD	ST FILLANS	DRY				

141	30008348	WELLSIDE PARK	SCOTLANDWELL	WET				
142	30002350	CAIRNIE ROAD	ST MADDOES	DRY				
143	30002350	CAIRNIE ROAD	ST MADDOES	DRY				
144	30007961	THE SPIRES	ST MADDOES	DRY				
145	30005410	LONGFORGAN INTERCHANGE	LONGFORGAN	DRY				
146	30006564	FERNHILL ROAD	PERTH	DRY				
147	30005774	THE TRIANGLE	PERTH	DRY				
148	30007069	LAESDIE COURT	PERTH	DRY				
149	30000069	CROFT PARK	PERTH	DRY				
150	30000303	VIEWFIELD PLACE	PERTH	DRY				
151	30006746	INCHYRA ROAD	ST MADDOES	DRY				
152	30008504	NEWHOUSE ROAD TO NEWHOUSE PLACE	PERTH	DRY				
153	30005775	AULD BOND ROAD	PERTH	DRY				
69	30004169	A9/A85 JUNCTION UPGRADE	PERTH	WET	South - Wet Soakaway	Likely	Surrounded by fields, industrial estate and houses	Not yet built - porous soakaway suggested
69	30004169	A9/A85 JUNCTION UPGRADE	PERTH	DRY	North - Storage Tank? (Borehole)	Likely	Surrounded by fields, industrial estate and houses	Not yet built - porous soakaway suggested
54	30007347	TAYCLADDOCH FARMHOUSE	GRANDTULLY	DRY				
23	30001094	DUFF AVENUE	MOULIN	DRY				
34	30002137	OLD EDINBURGH ROAD	BRIDGE OF EARN	DRY				
34	30002137	OLD EDINBURGH ROAD	BRIDGE OF EARN	DRY				
44	30006955	SCHOOL LOAN	CROFTINLOAN	DRY				
		Bertha Park Project	PERTH	WET	Not Yet Built	Very Likely	Ponds within fields' likely migration routes. Well maintained, healthy ponds. Waterways from bertha Loch are likely to also hold amphibians although none spotted.	Mitigation strongly advised. If drainage ditches rather than drains suggested.