WWT Wetlands for life

Catchment Based Approach
Partnerships for Action

SuDS+...how nature would do it

This script is designed for use in conjunction with the accompanying powerpoint presentation with the same title. We recommend that you practice using the script alongside the presentation before using it publically to become familiar and confident with the content. The content of the script itself is a guide to the slides and a suggestion for what to say - you are of course welcome to adjust and embellish the script to suit the particular audience and perhaps also make the presentation more personal to your own knowledge, experience and context.

Slide 1 Title Slide

Sustainable drainage systems, or SuDS, is a term that is being used more and more in water management – by planners, developers, academics and environmentalists. This presentation aims to help demystify the subject of SuDS and in particular highlight that not all SuDS are the same – there are 'good' SuDS and there are 'bad' SuDS, or rather that if designed and managed properly SuDS can deliver a huge range of benefits – they reduce flooding, improve water quality, provide lots of amenity value to people and are great places for wildlife. So perhaps rather than good and bad SuDS it is better to think of the good ones as SuDS+.....and SuDS+ is, in its simplest sense, how nature would do it.

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Slide 2 What's the Issue?

We'll come on to exactly what SuDS are (or rather what they could be) a little later. But first of all, what is the issue? Why do we need them? Why do we need to change?

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Slide 3 A typical river catchment

It's because these days a large (and growing) proportion of us live in urban, suburban or at least 'built-up' areas. We've sealed this 'urban surface' with hard impermeable surfaces - concrete, buildings and roads. We've drained and dredged and strained and piped natural watercourses and have radically altered the natural hydrological cycle, turning our urban rivers into polluted trenches that people treat as dumps.

And what happens when it rains?

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Slide 4 Our urban landscape is struggling to cope

This does – the system can't cope and we're subject to flash flooding. There is no space in our rivers as we've constrained them so much and our drains are easily overwhelmed because they no longer have the capacity to cope with the increased amount of polluted wastewater we put down them and the increased amount of rain which needs to get down these holes at very short notice.

This is why we need to change. We are dealing with increasingly frequent episodes of flooding which is devastating for people and their lives and their homes. And often it's not just something that affects them for just a few days but it affects them for the rest of their lives.

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Slide 5 SuDS-based solutions

So how can we change? We can't just turn our catchments back to how they looked before we altered them, but we can restore many of the functions they performed. This is what SuDS are all about.

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Slide 6 SuDS catchment

SuDS are really ways of putting back into our living and working spaces the natural way of things. If you can imagine at the top of a natural catchment you have lots of lovely woodland and spongy grassland that holds and cleans water before releasing it slowly, then at the top of SuDS are biodiverse green roofs, living walls, permeable paving which soak up water, clean it and then let it out slowly.

Then we can move that water through grassy conduits called swales - the seasonal streams of the SuDS system. These can be great habitats for invertebrates, wild flowers and amphibians but also help to move the water slowly to the ponds and other wetlands at the bottom of the system which are great places for wildlife and for people to enjoy.

So, if we do it properly, we have the opportunity to create better and more enjoyable places to live – something which conventional drainage systems hidden underground can never achieve.

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Slide 7 Typical SuDS - a missed opportunity

However not all SuDS are born equal. They can provide great spaces for people and wildlife but you can also do SuDS badly.

Once you put water in pipes and hide it underground, you struggle to make good SuDS – even if and when that water does eventually reappear.

This image shows a fairly typical SuDS feature in a new development. It has some good points – for example it has some diversity in the wetland habitat, some open water, some islands and marginal habitats - and is certainly not the worst case out there.

However it also has several negative points. For example [Click for red circles], large concrete headwalls . When we put water in pipes it moves more rapidly and then when it eventually discharges, it needs to come out of them safely and not cause erosion. This is the job that concrete headwalls do but as well as being ugly they are also a real health hazard, especially for young children - as the yellow warning sign indicates.

Another issue [Click for red circle] is the steep slopes to the basin. Because the water enters the basin through pipes dug down into the ground you have to excavate a large, deep, bomb-crater like hole. If there is limited space on the site, as is often the case on developments, these holes have very steep sides and present a real health and safety risk, especially to children.

In addition to the warning sign, the presence of a lifebuoy [Click for red circle], and fencing [Click for red circle] in the background may be necessary in this situation but they are indicative of how we feel about these kinds of places – they are not designed with people in mind, they are designed to keep people out.

And what happens when young people do get into these kinds of places, and get into difficulty, as they inevitable will? It is difficult for other people to get in and help them, and it is difficult for people who are injured them to get out themselves. So the fence and other features actually become an obstacle to health and safety, not an aid to it.

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Slide 8 SuDS+

SuDS don't need headwalls, steep slopes or deep standing water, and as a result they also don't usually need fences. All of these things can be avoided through good design that takes a proactive approach to dealing with health and safety risks.

A few simple design improvements can turn them into great places for families to play, enjoy picnics, get closer to wetlands and just have a great day out in their local neighbourhood.

This is what SuDS+ is all about. It is of course about managing water, preventing flooding and cleaning water but it is also about people and wildlife and creating nicer, more enjoyable, places to live. Flooding is becoming an increasingly national issue but when it happens flooding is very much a local problem. The solutions can be local as well, and in the case of SuDS+ can be used to bring a whole range of benefits to individuals, communities and neighbourhoods.

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Slide 9 SuDS Principles

So, something as routine-sounding as a 'drainage system' can provide a whole range of benefits to people, or 'ecosystem services'. But in order to do so it has to be done well. A simple way to ensure this is to keep in mind some key principles when designing, creating and managing the systems.

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Slide 10 Principle 1 - Keep water on the surface

The first key principle is 'keep the water on the surface'. If it isn't on the surface then you can't do a great deal with it. As we've just seen, if the water hidden six feet underground in pipework you lose the opportunity to create beautiful places for people to enjoy and it causes problems when it does eventually come to the surface.

Keeping water on the surface allows us to really go to town on creating habitats for people and wildlife. If it is kept on the surface we can also easily check on its quality, see how the system is performing and, particularly towards the bottom of systems once the water has been slowed and cleaned, create great wildlife habitats like this one.

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Slide 11 Principle 2 - The more minds the better

The second principle is to get a diverse range of people involved in the design process – the more minds, or in fact the more different minds, the better. This is necessary to capture all of the broad range of benefits that SuDS can provide. No longer is it acceptable for this to be the domain of drainage engineers alone – we need people like landscape architects, local ecologists, local planners and the local community involved from the beginning and able to fundamentally influence the design of the scheme. This will ultimately result in better systems that are properly managed into the future.

People have a growing interest in their own environment and have a right to be involved in making decisions about it. SuDS are a great way of getting people together to make positive change. They cross many different agendas - community cohesion, health, flooding, water quality, climate change adaptation. They are a way to deliver lots for not much money. So getting the relevant people involved from all of these backgrounds is key and these people are the experts in their local environment so why wouldn't we involve them? Local solutions like SuDS will only work and carry on into the future if people care about them. To care about them they need to understand them. To understand them they need to be involved in them.

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Slide 12 Principle 3 - Clean and slow water

The third principle is to slow and clean the water. When designed properly SuDS should gather the water up, slow the flow downstream and improve water quality. We need to generate clean water at a controlled rate that we can use for amenity purposes and creating wildlife habitats downstream of our green roofs and permeable paving. What we don't want is a lot of turbid, muddy water arriving all at once.

This photo is at the top of the SuDS catchment. This green roof is analogous to a temperate forest where water falls and is held in the vegetation and soils. The water slowly trickles out or is lost through evapotranspiration. And the water that comes out is clean and moves to the next stage – perhaps a rain garden, pond, filter strip, swale, or temporary wetland. The job of all features, but particularly those at the top of the system, is to capture and slow down the flow to stop flooding and prevent dirty water entering streams and creating unhealthy, sterile environments.

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Slide 13 Principle 4 - Provide for wildlife

The fourth key principle is providing for wildlife, and here is it all about diversity. It is important to be aware that while SuDS manage water, not all features are wet, in fact many features can be dry for much of the year. This variety of habitats, both wet and dry, can be of great benefit for wildlife if designed correctly, such as creating a diversity of physical structure – convoluted edges, slight rises and falls, areas of temporary and permanent water, mixtures of soil types, and areas that allow infiltration. Just as the diversity of habitats in a natural catchment provides for a variety of wildlife, the same principles apply to good SuDS design for biodiversity.

In this picture you can see a diversity of habitats, both permanently wet and drier ones, crammed into a small space. You can even further enhance the wildlife value, and indeed the visual appeal, through creative features such as this wildlife tower.

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Slide 14 Principle 5 - Community engagement

The fifth (and in many ways the most important) principle is to get local people involved. When you create these wonderful systems in and around where people live and work there are huge opportunities to engage those communities. That means getting people involved, getting people close to wetlands again, getting people to understand and appreciate water instead of fear it. In the past we seemed to have more of this connection but it's something that is being lost – think about the fun that you may have had playing in and around water when you were growing up. SuDs are a great way to bring those opportunities to people's doorsteps so that kids can have a great time exploring these habitats safely close to where they live. They are also just a great place for people to meet, chat and spend time - there are many examples of SuDS where people may not fully appreciate, or indeed care about, the drainage functions that they perform, they really appreciate how lovely the environment that they create is.

But more than that people can get involved in actually designing, managing and volunteering, monitoring on these schemes. To maximise this they need to be brought into the process as early as possible. It is really important that these are meaningful discussions, not merely faux-consultations or box-ticking exercises where information is just imparted to people.

This picture is of a school in London with a wildflower swale. Before the swale was put in, this was just a typical school field of amenity grassland with perennial ryegrass – fine for kicking a ball around in, and it still is, but now along the margins is great habitat for wildlife and a great extra resource for both play and teaching. The children were involved in the design and planting, including choosing what plants to put in. They are now engaged with the SuDS and so better understand water management and urban water cycles. This might be easiest to see with children in a school, but the same principle applies with all of us. SuDS are a great visual way to help people understand what is happening to our water and the consequences of the choices we make.

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Slide 15 Further Information

By following these simple principles, we can ensure that SuDS really do make a significant and positive contribution to enriching our lives. If you are interested to find out more about SuDS, whether you are a designer, planner, developer or simply thinking about doing something in your own home or community, please do get in touch

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or visit this website

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to download a copy of this handy guide on how to do SuDS+.

Many thanks for your time.