Substrates and Soil Compaction Problems – Dublin Zoo Experience

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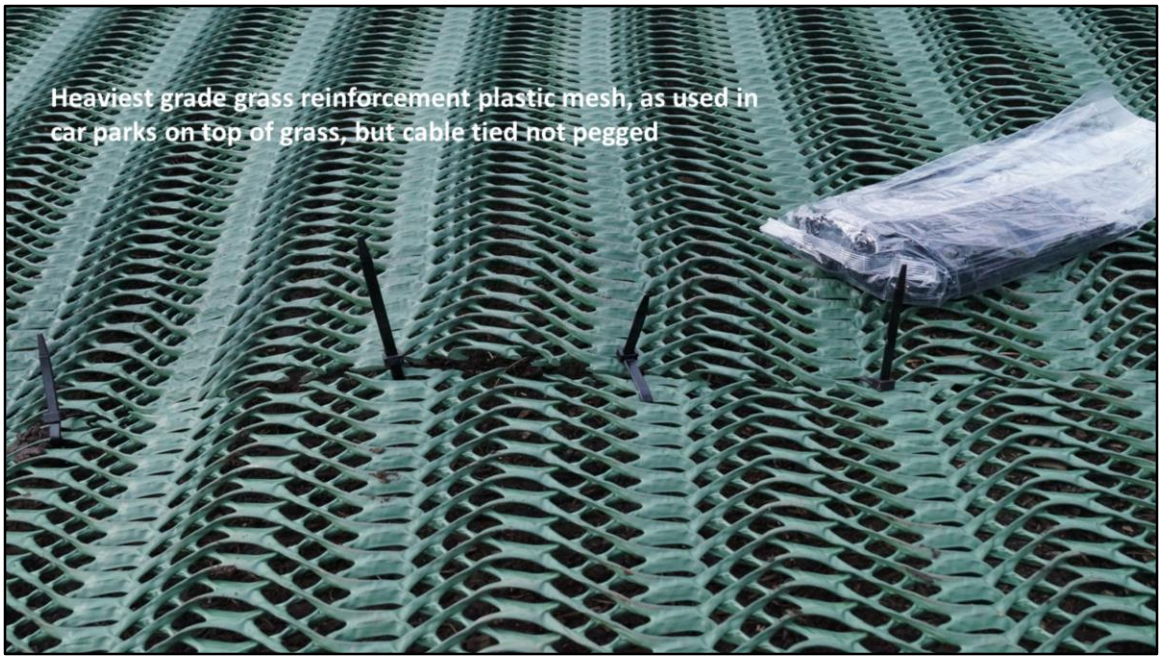
Mixed giraffe, oryx, and zebra habitat, half metre sand substrate, topsoil added for grass, compacted and waterlogged within 12 months

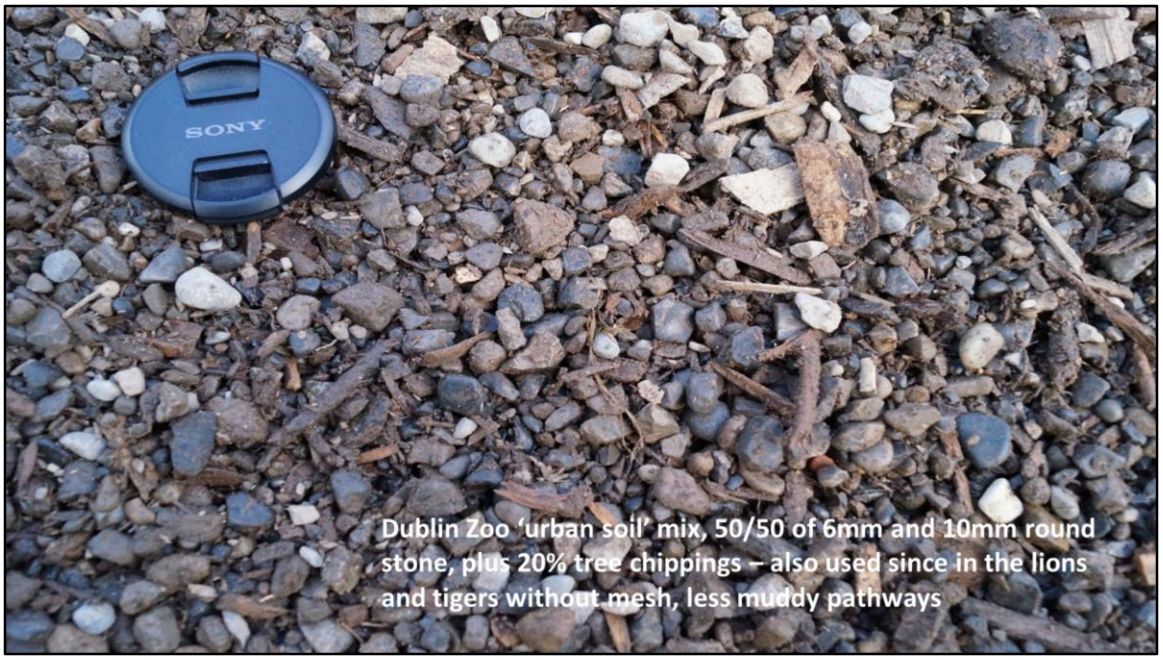
With wet winters foot problems can occur, a quick draining sand substrate, with drains beneath, was built for the giraffe, zebra, oryx, and rhino habitats. As an afterthought staff requested some grass. Topsoil was placed on the flat areas in late spring, rotavated in, and grass seed sown. All looked well until heavier autumn rains allowed poaching (surface soil compaction by animal feet) to occur. Only a few inches of the very top was poached, but it completely stopped water passage, and we had a pool there for months until decompacted.

Eastern Bongo *Tragelaphus eurycerus isaaci* caused severe poaching, rain retained on surface, very muddy, and over 10 years 10 trees died, with the compaction a leading cause of problems, with little air getting to the roots.

Once dry enough, dictated by weather, a trial area prepared, rotavated and levelled.



Plastic car park grass reinforcement mesh laid direct on top, edges butted against each other and cable tied, normally pegs used but these could have caused foot problems.



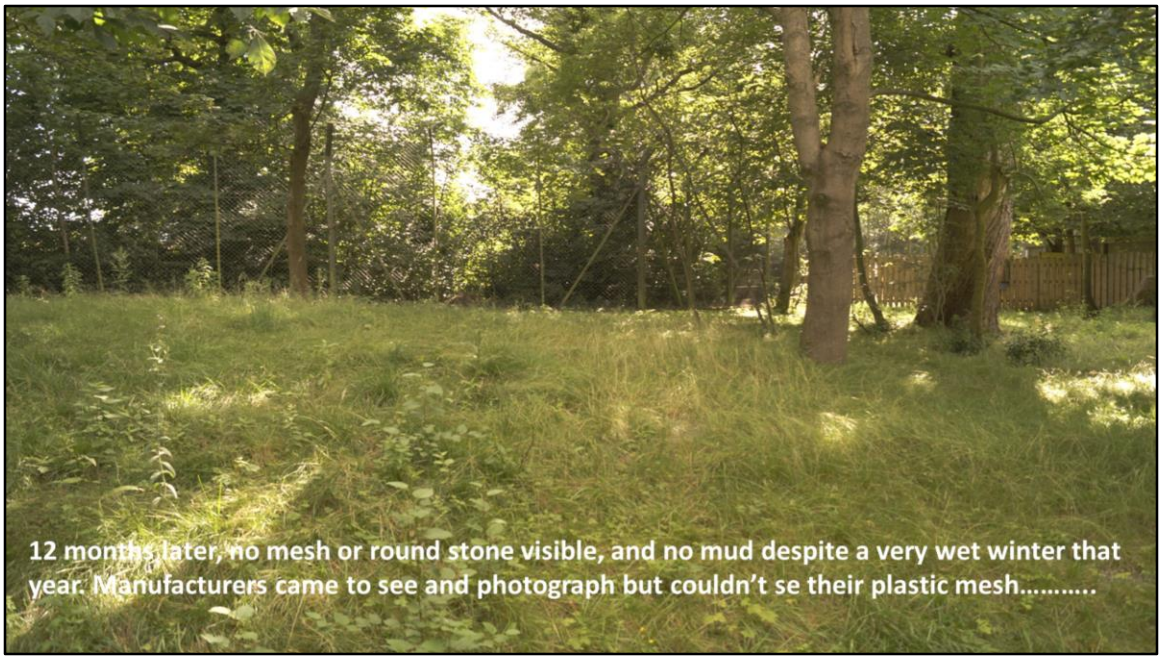
Normally the mesh has grass growing through it, it is laid on top of existing grass or seeded over. We needed to cover the mesh fully to avoid foot problems for the animals, and for appearance. Our 'home made' urban soil mix used. Approximately 20% air space needed. The stone mix can be checked easily, any one size stone, 5mm, 10mm, or larger, will normally have about 40% air space, mix 2 or more sizes and the ratio is lowered. You can check this easily with a 5 litre container, and see how many litres of water it takes to fill it after stones put in first.

Once mesh laid vehicles can drive on it with little soil damage. 'Urban soil' mix spread fairly evenly, about 50/75mm thick.

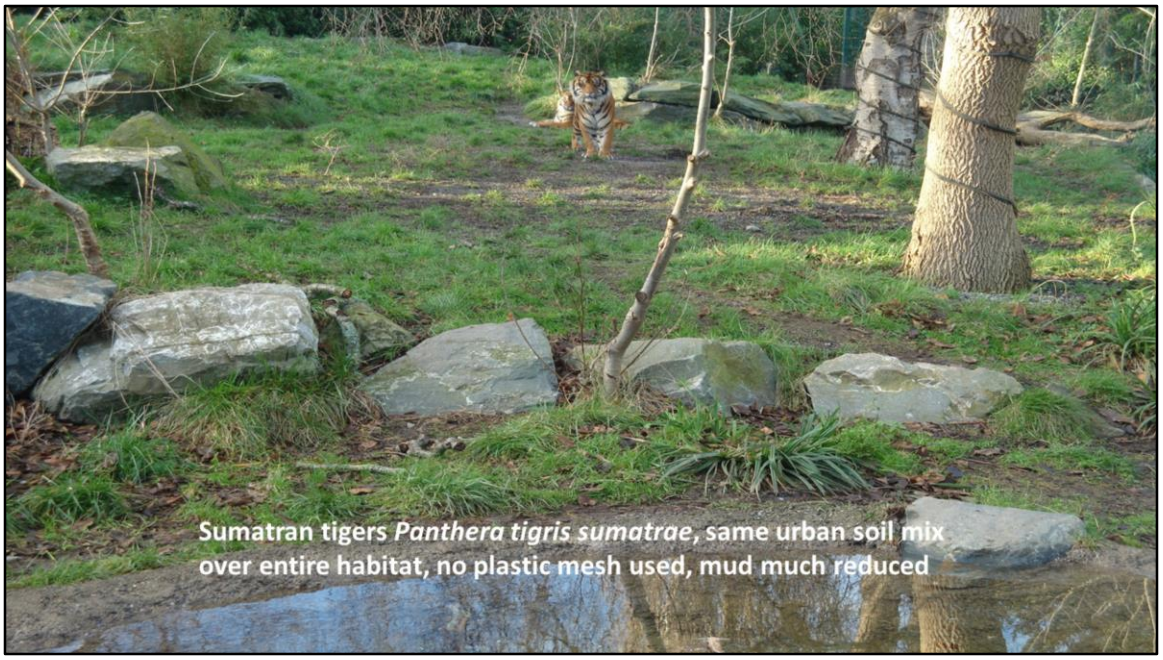
The bongos soon found the new surface, and preferred it so much that staff moved feeding points on to the area.

An adjacent area was selected for okapi, to prevent any compaction from the start the same mesh and urban soil system used. Note vehicle on mesh, weight is spread more evenly, little damage to soil.

Even in the wettest winter weather there was no soil problems, animals and staff could access the area, no mud, and most importantly for us, no tree root damage.



Following summer, excellent cover, no mesh to be seen, simple solution to a severe problem.



To reduce mud in tigers, we tried using the urban soil mix without mesh, about 75mm depth. Grass seed sown on top again, grew very well, and only the regular paths selected by the tigers themselves had any mud at all. This was reduced further by topping up with a little more urban soil – this will need doing occasionally but only in small areas as needed.