



The Sand Invasion, five years on.

August 2011.

“Two parts sand, one part imagination”.

Who's been doing it?

Well, since my first article in the American Keeper Forum 2006 the sand flooring idea has really taken off in many directions and in many versions. I feel now zoos and even private elephant holders are considering the use of soft substrates for the elephants to interact with and sleep on.

The original article in 2006 firstly rubbed a lot of people the wrong way and I heard through the grape vine sweeping statements, that elephant management as we know it is going to the dogs and we were putting our industry at risk by suggesting such ideas out of the box ideas. Some notable experts suggest that we should just all stick together, become one, rather than suggesting such things, all statements were quite a shock when you consider we are responsible for the future of a highly endangered species. The lets all stick together suggestion was the funniest to me after being in the business for so long and watching people come and go some trying to make their empires on the backs of elephants wouldn't you think we would want the best for our elephants.

These were of course ridiculous statements and all efforts and opinions at this point should be considered if we are going to make further inroads and successes with our captive elephant management in our zoos. We should get back in the box in some cases of elephant health and comfort.

There are many zoos that have alter an existing elephant space, that's to say a small stall, one of four and put 6 inches of sand to allow the elephants contact with a soft material at night, this is only an offering a placating of the subject, also very similar to putting down a rubber floor because it is softer on the elephant's feet. This approach is not an actual buy in to an elephant's captive issues and comfort, nor is it a true investment of philosophy that will support the future of captive elephants in our zoos.

Seen by many as too much work, I have heard everything there is to say about the problems of sand topography and flooring. Won't they dig and make holes in it? Yes. Won't they throw it on their backs? Yes. Won't it be harder to clean? Yes. Will it smell of urine? Not necessarily if the area is large enough, but if you try and make a space which is too small and not meant to hold sand, it will become saturated and smell of urine. Will the sand not get wet and hold bacteria? Same answer as above.

The comfort as it pertains to the elephant was never a consideration twenty years ago, a working animal was very rarely offered physical enhancements, betterments to where they could express themselves, be comfortable and satisfied as an organism.

Elephants have always been seen in the west out of convenience or just out of a historical perspective not really sure, as a domestic animal parked at night like a bus, ready to be used

the next day at a moment's notice. This, I have to say, was not a calculated "let's be mean to the elephant" as many would have it portrayed, particularly in the fringe welfare groups and animal rights businesses, we the people of long histories became very good at normalizing the abnormalities we created we made an elephants life comfortable to the point of our knowledge and understanding, our understanding has broaden, it got out of the box many times.

So who to date has provided deep sand or natural interactive flooring for their elephants 365 days 24/7 and what has been the benefits? The four most prominent zoos at the moment that have installed large natural inside surfaces for their elephants in Europe are Chester Zoo in England, Dublin Zoo in Ireland and Copenhagen in Denmark. Dallas Zoo in the USA also added an inside sand area to their new habitat which opened last year.



Chester Zoo.

Copenhagen Zoo.

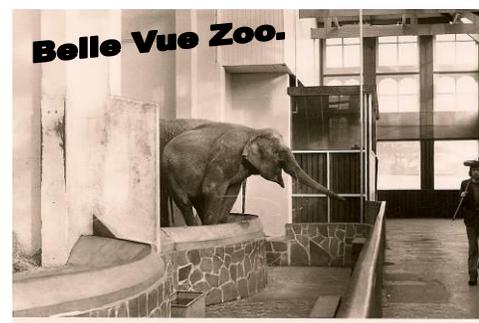
Dublin Zoo.

Hagenbeck's Tierpark

Who is thinking about it? The sand idea is catching on around the world in various styles and designs; some zoos are just piling sand up in a corner of an old stall and getting good results and in some cases seeing elephants acting differently. One zoo in France that I worked with for a short period, some years ago, actually put sand down in a very poor inside environment on my advised, an environment that would be mentally draining for any organism even a human, more like a dungeon than a habitat. The elephant that was housed in the room hadn't lay down since he was young but evidently found some satisfaction with the sand, which had been stacked at one side of the square room, because after a couple of weeks of recumbent rest and sleep on the sand he started breeding the cows who he previously had no interest in.

A coincidence, maybe.

What have been the benefits? When I was a child my father would take me to the local zoo in Manchester, England, an old zoo called Belle Vue, incidentally the first zoo to install & use electricity, I was told. The elephant house was designed so the elephants stood on a platform on a backward sloping floor with a moat in front for the best possible viewing for the visitors. When I was eight my father who was an amateur naturalist and a fish and reptile



enthusiast would divulge information about animals as we walked around the zoo, kind of like my own animal planet, some of the information he would tell me would stick in my mind, for instance, elephants can sleep standing up, that of course is true, but what he didn't tell me, something he could not know was that the elephant deteriorate physically if sleep and positive rest is absence long term. Like us the elephant as to lay flat to truly rest, leg hopping and dosing does not constitute rest. Another thing he told was, elephants need to walk, and this of course is true. The resident elephant trainers at Belle Vue Zoo would take their elephants for long walks around the zoo, only on asphalt, because they didn't have an outside enclosure. Other less appealing items from his commentary would be promptly lost in my young mind. One thing that always intrigued me was the ability of the elephant to sleep standing up. A fact later in the same elephant house and the then employed mahouts would verify, but actually would also not understand. The fact that most zoo elephants stop laying down to rest is they can't anymore, the floors were either too worn & broken up or the elephant would be too old and out of condition to make the effort. It wasn't till later in my life, much later unfortunately, would I understood the consequences the lack of rest or the lack of space would have on the sleeping habits of zoo elephants.

Heidelberg Zoo in Germany has moved to a totally new environment for their elephants. The old Heidelberg Zoo elephant house was built in the 60's and was an example of the old architecture that was deemed acceptable in its day. Even with the small in door exhibit the zoos elephant staff and management had provided Heidelberg Zoo elephants with a comfortable environment see sand bed to the right and presently have moved over to a larger scale habitat with a large inside sand area, a mixed exhibit element by allowing Axis Deer an Asian species of deer to share the environment with the elephants.



Another well known zoological institution that is considering natural flooring in their elephant habitat is Blair Drummond Safari Park in West Scotland. This institution has made extraordinary progress in living conditions and training with their elephants and are ready to make the next very important step. In 2007 the park made a very strong statement when they designed in house and built a new Rhino habitat, also with natural flooring and outside covered areas for extended periods in the fresh air, a must see if you are holidaying in Scotland. Jamie Muir, Blair Drummonds owner and Director is pushing for the park to be one of the most innovative and progressive zoological organizations in Europe when it comes to Elephants, Rhino and Giraffe. In 2012 Blair Drummond Safari will open a new habitat for elephants at the park which in my opinion will push the bar up even higher with new inclusion, feeding, movement, surveillance equipment and sleeping strategies back up with research and backing from a major University.

Phoenix Zoo in Arizona, USA made many positive changes to their elephant management, one of which was a focus on the inclusion of sand sleeping and resting areas for their elephants. Inside and out they provided opportunities for elephants to interact naturally with the substrate.



The keepers at Phoenix try very hard and success in creating areas where elephants can relax and charge their batteries. The inside elephant areas once had hard floors but with careful observation of the elephant behavior the elephant staff put their finding to work.

Facility design, biological awareness.

Watching elephants in these larger sand facilities its easy to see the benefits, but its not only sleeping where the difference is made. After watching elephants that have little understanding of their natural behaviors move across an inside sand area that has been manicured and pre-furnished to attract natural elephant behavior is one of the most satisfying

Herd dynamics are being positively affected because the space we are now using and are willing to invest in combined with a sand

environments being built where other natural tendencies like climbing, digging, encouraged after the keepers hide turnips, apples and carrots, elephants also like to throw sand and dirt on their backs, but not on our 9 to 5 schedules, they like to move around 24/7 and have space even inside where we historically kept them in small boxes. Light is a key component to happiness and wellbeing in humans. I believe the cabin fever effect also impacts elephants zoos. We already know that long hours of darkness bring down the spirits in northern climate with people actually going crazy from being cooked up for so long under artificial lighting. In Copenhagen for example the new habitat with its huge free spanning glass roof allows natural light in, without restriction. *But what does natural light mean to the elephants?* It means they can use their habitat from sun up to sun down, even in winter, benefiting from the continuous movement and the ability to exercise their natural attributes like reaching & climbing 365 days a year.



Positive stress in elephants, is there such thing? Are there circumstances that create or can create a positive reaction within the group, I believe there are. For example elephant facilities design with adaptability is the key, flat hard baron areas with little stimulus are rapidly

becoming out of favor with our design teams and are very fading into the past. One young elephant in an elephant facility I work got lost in the inside area, because we have the ability now of moving furniture and either flattening or randomly piling sand, depending on the habitat design direction the elephant team has chosen that week. This for me was a huge step forward and seeing that the sand manipulation concept is working well and witnessing it firsthand, I knew that we are still on the right track.

From an elephants perspective.

The elephant habitat at Copenhagen Zoo. (An article the author wrote for an Architectural magazine).

When I was asked to write this article I felt honored because I feel strongly about the attributes and behavioral opportunities this new building offers elephants and because I know it will make a difference in many areas of elephant's welfare in our zoos worldwide. Some people are calling this the best elephant habitat anywhere, on a par with slice bread. I have had a relationship with elephants for over 40 years and I have spent my life pushing ideas that would benefit elephants worldwide. The new Foster elephant habitat in Copenhagen provides the elephant with three main components space, sand & light and of course many more when looks around this excellent building, but I was given the direction of only 1600 words to give my opinion. What difference do these three elements make to an elephants life in a zoo?

Take space for instance, we as humans take it for granted, long walks in the country, a change of atmosphere put things in perspective for us. But what does space mean to the elephant? I believe elephants need to get away also, they need to a walk in different surroundings and need to have time without interference from their co-specifics; the new habitat provides just that and much more.

Inside the new habitat due to the ample space we are able to move enclosure furniture around, like large tree stumps & rocks creating a different environment so the elephants are challenged mentally and physically every day. The climate in Copenhagen has its challenges also; long periods of very cold weather means that at time the elephants cannot go outside but with our ability to create habitat in the space we have provided, the elephants can go about their business as normal, throwing sand, digging, rubbing their skin on the rocks and tree limbs. Copenhagen Zoo is one of the few zoos around the world breeding elephants. The Asian elephant is an endangered animal so anytime a zoo as a baby it has enormous significance on the world wide population which stands at the moment between 30 & 40,000. The education of these babies is our responsibility and in the space the Copenhagen building offers the young elephants can play and grow safely. The spaces allows for the young elephants to stretch their bonds with their mothers and at the same time grow in confidence as they find themselves further and further away from mum. We are witnessing changes in herd dynamics; elephants usually subordinate or reluctant to push in during feedings are now exhibiting behaviors more indicative of elephants with confidence and an understanding of social skills, we are seeing positive changes in their daily patterns and we believe there is more to come.

Light is a key component to happiness and wellbeing. The cabin fever effect also impacts elephants. We already know that long hours of darkness bring down the spirits in northern climate with people actually going crazy from being cooked up for so long under artificial lighting. The new habitat with its huge free spanning glass roof allows natural light in, without restriction. But what does natural light mean to the elephants? It means they can use their habitat from sun up to sun down, even in winter, benefiting from the continuous movement and the ability to exercise their natural attributes like reaching & climbing 365 days a year.

Sand, now this is a revolutionary inclusion and truly a benefit that is taking zoos in Europe and the world by storm. The story of a sand substrate in the Foster elephant habitat began when I was asked to advise Copenhagen Zoo on their elephant management. I came into the zoo after the plans for the new building had, for the most part, been agreed upon but one aspect was still a concern, the hard floor in such a large space. Introducing Camilia Norgard head of the behavioral science department and who at the time of the habitat design was responsible for elephant behavioral enhancement at its concept in the zoo. Other zoos I worked for had installed sand and natural surfaces

inside their elephant building with great success and we thought it would be worth suggesting the idea to the zoos design team and the Foster Group. Camilla and I took a strong stand for sand at design meetings and finally the idea was accepted and became a major focus to the house. But what does sand mean to the elephants? Quite simply put, variety. The sand gives us the ability to create different spaces, mounds, hills, flat areas in different places each week. Historically elephants have been kept on flat floors with little variation, so our new inside sand floor allows us to design topography into the elephant's daily life. The type of topography we create offers the elephants climbing opportunities for building muscles it also promotes problem solving when we bury apples and carrots randomly around the sand area. We have found that the elephants really like this behavioral enhancing procedure, searching for hours after the last apple has been found. For me I think the most important aspect of the sand flooring is the possibilities it allows for elephants to rest & sleep. Elephants in the wild seek soft slopes of sand or deep litter to lie down it supports and forms to the body. The slope is important because of the elephant's large body mass it can get up easier with one swing of the back leg and the soft sand cushions the knees and elbows as it gets to its feet. Elephants like comfort they seek anything that makes life easier and sand flooring as proven time and time again that if the sand is manicured and prepared they will use it in their daily life and hygiene. The sand also holds the humidity which is important to the health of the feet and skin of the elephants, all this in conjunction with the elaborate climate control in the house, we have the ability, at any time, to create a near perfect condition for the elephants to thrive.

Of course the habitat has many other important aspects, complex feeding apparatus so the elephants exercise while feeding, a deep pool filtered where in summer the elephants can bath thrilling the crowds with their diving and snorkeling games.

So in conclusion, are we happy with our new habitat? That would be a big Yes, are our elephants happy that is also yes, they are moving more, spending time exploring every corner of the habitat, and with ability to move it all around on a daily basis, they never know what the day is going to bring.

In closing one element I must mention, the clear visibility and walking space combined with a second to none interactive section it is a great experience for our zoo guests. If you happen to be in Copenhagen come look us up we will be pleased to show you around.

Teaching old elephants new tricks.

Early in 2006 I met a family near Alicante Spain that left an every lasting impression in my mind. Alex Cristiany and his father Michael and mama the mother of the family own an elephant; "Babaty" is her name. Babaty has been with them nearly all her life; she is in her thirties now. I have been around human elephant love most of my life, people who say they have the best interest of elephants at heart, but I have to say love like this I have never felt before. The Cristiany family called me in to look at her feet where abscesses they had been dealing with, had for them, got out of control. We brought the abscesses back to center in relatively quick time.

I wanted to mention this meeting with Alex's and Michael because their dedication sticks in my heart and has become an inspiration, in a small way and will help me go on to help others with elephant's. After we had worked on Babaty's feet and redirected the families' efforts and treatments with the abscesses we got around to talking about Babaty as an elephant. They had never had such a conversation before and sat and took it all in as I preached to them over many coffees. The upshot of our discussion was an absolute turn around in the way their thought about Babaty. We talked about soft flooring for her comfort, hanging feeders for muscles conditioning and pipe feeders to make her think. She went from family pet to unique organism with independent requirements and physical tendencies in the time it took to drink three coffees, the light going on at the Cristiany residence was far faster than at any zoological institution I interface with. I guess for me the time frames concerned to establish a difference

for Babaty was another eye opener, in about the time it took for me to fly home to San Diego I received numerous photos per e-mail; I want to share those photos with you now without explanation, they speak for themselves.



If we are not in the future yet, what does the future have in store? I feel the future holds a number of exciting challenges to the way we will think about elephants in our zoos. First, I believe we will finally and completely start to view elephants in zoos as an organism with unique attributes and interesting social structures and not take any examples from the working animals we see in Asia.

Now, I have to say in support of all the people who are pushing the envelope in areas like reproductive biology and AI, TB, and herpes research these are important aspects, but these areas of elephant management live under the shadow of herd nucleus and the education of young elephants, longevity and the individual comfort for older animals in our collections.

Although we cannot ignore our history and our long standing relationship with the elephant, I feel at some point we must cut this form of exhibitory loose and start to look at the elephant as a wild animal in zoos if we are to meet our stated conservation goals. Why? Well, it's quite easy, we have generated by our inconsistent handling and care many unstable animals, rejects, animals without a social education de-programmed so to speak, elephants not knowing how to react even with their own kind. Do we want the next generation of zoo bred elephants to be void of their own history and how will we keep explaining our shortcomings when we continue to produce so many bad examples at hand, we can only push the ambassador envelope so far till we ourselves have to look at what it is we are saying.

What the working elephant stands for in Asia cannot be repeated by many people in Europe and the USA, there are only a small few people who even come close to having satisfactory experience, personal work ethic standards and management philosophy with elephants to be working with them in a free contact. I know two, how many do you know?

The future for elephants in zoos has to lay in herd management complementing the herd nucleus, kept in sustainable groups free of restrictive routines, wandering under semi-normal conditions in newly design and thought through habitats where animals are approached and accessed at their point in the day, not brought into a building taken out of their daily rhythm. We are nowhere near this at the moment in our zoos, in fact in some cases we are going away from it.

So if sand areas are beneficial, what else should we be thinking about? One thing that is not in focus, in my opinion, is our support of herd nucleus. We have not decided in our zoos whether the elephant is a beast of burden or a wild animal. Till this fact is brought into focus nothing else will fall in behind for our zoo animals and we will continue to be content with fragmented groups and a very low breeding and social competence in our elephants.

New interruptive examples that educate our zoo guests.



Humidity controlled environments.



Sound explanations of the beneficial of sand.

It is a challenge to keep an animal that has evolved in a humid, wet and in some cases elusive environment, like the Asian elephant but with careful planning and designing using the elephants own physiology and natural history as our guide, I feel we can provided these undebatably unique animal a comfortable and sustainable future in our zoos, but it does take vision, imagination and people who are willing to view into the future and to take proactive steps in new direction.

Older elephants benefit the most. “One small step for elephants”.

Young elephants, as we all know, bounce around on hard soft flooring, it doesn't matter to them but as the years creep forward the bouncing slows down to that moment in time where they give up and cannot negotiate the hard concrete.

Just recently I received a photo from Copenhagen Zoo in Denmark it was of their 56 year old breeding male Plaisak laying down on his corner sand pile that is provided for him in the new habitat. Plaisak was kept in an older building built in 1914 since his arrival from Thailand many years back. He negotiated his designated area for his whole life till the zoo built a state of the ark new habitat for the breeding group.

Plaisak, I believe had stopped lying down to sleep many years before because of his size his condition and the lack of space but had created his resting habits like many other older animals in our zoos. Plaisak took with him to



the new habitat in 2008 these habits which took him many years to hone but which were not his own best interest. After his arrival at the new habitat the staff at the zoo religiously prepared his sand area every day in fact they prepared it for the last three years, believing one day he would lay down to rest. Well, earlier this year Plaisak was caught on the night surveillance cameras lying down. This is a huge achievement where his future health is concerned and it will put more miles on his clock for him to use in his twilight years at the zoo.

Challenges with sand flooring.



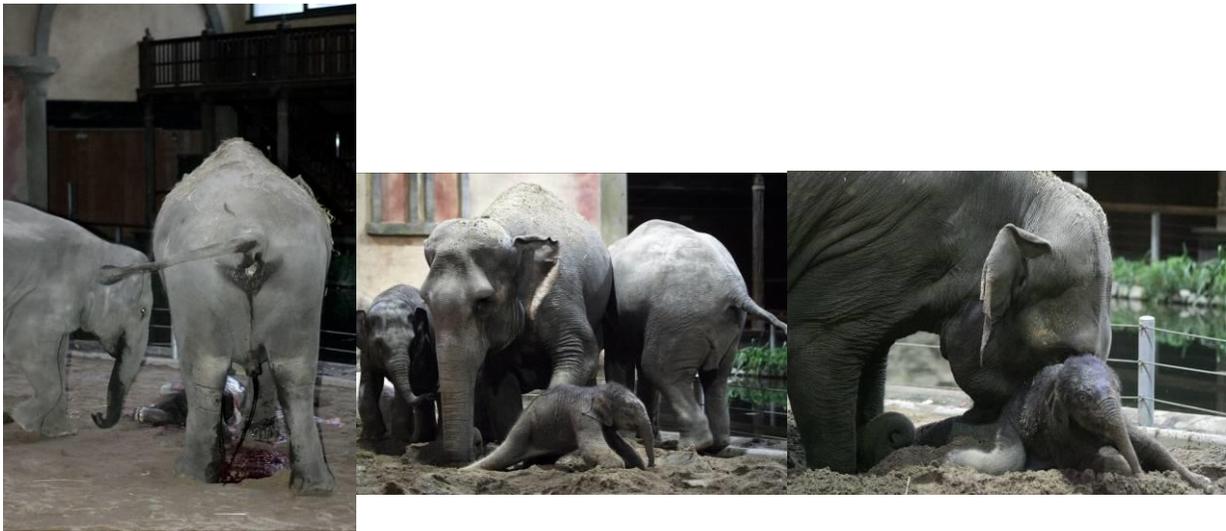
I remember the days when we hosed and hosed the inside areas of our elephant houses, and although there are still modern zoos, which to me is mind boggling, installing large barren concrete floors, that offer no interactive value but still need brushing and washing.

I am happy to say that there is a general shift in the zoological world is towards sand, large quantities of sand, but more arm twisting is still needed for the none believers'. This shift in philosophy does not come without a cost, however, a cost in time budgets, purchasing of earth moving equipment and a cost in our overall thinking and historical cleaning tendencies. Making the decision to install sand for any elephant habitat should be evaluated so the outcome is beneficial for the elephants and ultimately the organization is behind the decision. I say this because it is not just a matter of installing the sand and we all go home, a manicured, prepared sand floor should be more interactive for the elephants allowing the elephant to demonstrate many more complex behaviors than they can on a hard unyielding floors you're your sand floor is as flat as a table you are off the mark completely.

When first considering sand areas, one of the first things people ask me is what is the optimal depth of natural flooring. Please refer to the BIAZA elephant guidelines for a more complete understanding of the requirements for sand flooring for elephants, it will give you the size of sand grains to buy, some are better than other and allow water to run through easier than others. To date there have been many tested ideas, depths vary from 20 cm to 2 meters have been tried and even after having long discussion with zoo designers, directors and curators about the merits of sand topography the deeper the sand the better it works when you consider all the possible uses in an elephants life.

For birthing sand has proven revolutionary, gone are the days of restricting the elephant while she give birth, the first imprinting possibilities for the mother and calf are very important to the

mental health of the calf. Babies are gaining their footing after 4 minutes without assistance from the keepers. Zoos are seeing faster development in their young elephants, more confidence and it seems a greater capacity to learn. It is early stages yet with a lot more to learn about the benefits of sand in the birthing process, but please do not underestimate its role in this area. It has been suggested in conversations at the Hamburg School among some of the young attendees that one possible reason why the mother goes down with her head to the baby right after the birth is she might be flooding the baby with infra sound, a level of imprinting that slip through our net back when we thought she was going down to kill the baby, the reason why we chained many of our births.



The photo sequence above is from Hagenbeck's Tierpark Hamburg in Germany where they are now entertaining multiple births on sand, and are seeing quick recovery times of the babies, less stress in the mother and other herd members who are present at every birth providing a crucial education of the multi-generational herd.

Searching for Signs.

A new observation technique in the arsenal of the elephant manager 2011 is searching for signs of rest and sleeping over night in the sand piles around the habitat. Providing you have adequate sand, deep enough to manipulate with machinery and form into slopes and attractive sleeping areas, a result will be an impression left in the sand indicating how and where your elephant slept. "So what I hear" well a rested elephant is a productive elephant both during training and possibly when you have a breeding group and tranquility might have a positive impact on the herd nucleus.





Copenhagen zoo to the left has a high maintenance schedule for creating habitat for their elephants and all elephants staff members are focused on this task, the manipulation of sand falls right under food and water in their husbandry routines. One of their main focuses after the elephants have left the space is to look for sleeping patterns in the sand, this combined with a review of the overnight surveillance camera form one hell of a health support program.

Some zoos have, on their/our journey to understand natural flooring and other natural needs for zoo elephants adopted major philosophical changes to the way there are approaching elephant management. The elephant is not a complicated animal by nature we already identify them as super intelligent, I heard a zoo commentary the other week that portrayed them to have the intellect of a five year old person, a fact that might make them so tolerance to our indecisions in human hands. Folks, it can only get better.



What impression will you leave on your elephant management program??????

Photo acknowledgments:

- Copenhagen Zoo elephant team.
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