

THE WELLNESS-FOCUSED ZOO

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About the Author

Pete specializes in zoological and sustainable design projects with a focus on wellness and resource efficiency. He is the designer for Zoo Atlanta's African Savanna Expansion and Zambezi Elephant Center as well as its soon to be completed Savanna Hall Renovation of the historic Grant Park Cyclorama and the new Entry Plaza and Ticketing Building. At \$52M, Zoo Atlanta's Grand New View projects represent a dramatic re-imagining of the northern third of the zoo. His recent experience also includes a Grizzly Brother's habitat at Riverside Discovery Center in Scottsbluff, Nebraska and several projects for the Oklahoma City Zoo and Botanical Gardens.

Pete is both a WELL Accredited Professional and a LEED Accredited Professional. He has helped provide over 60 educational seminars and classes throughout the Southeast region on topics including energy efficiency, environmental life-cycle assessment, and improving the performance of existing buildings.



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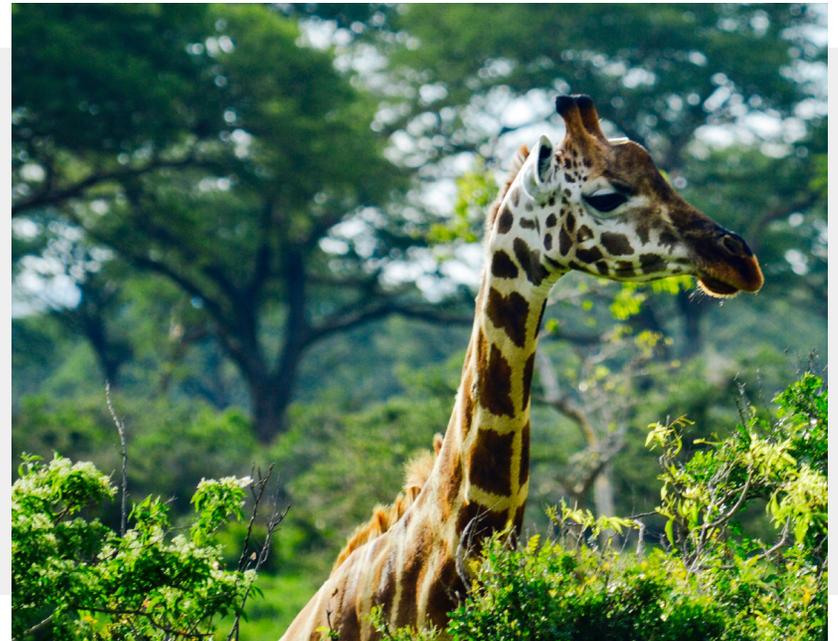
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Introduction

It was late February in Cleveland, Ohio in 2015. As a part of a fact-finding expedition for our design of Zoo Atlanta's African Savanna exhibit, for which I was the designing architect, I had embarked on a brief expedition along with my exhibit designer, Nevin Lash of Ursa International, and Zoo Atlanta's head of their African Elephant habitat, Nate Elgart. We were on the second leg of a multi-city tour of elephant facilities that crisscrossed the country from Arizona to North Carolina. We landed in Cleveland just as one snowstorm had passed through and shortly after we completed our tour of the Cleveland Metroparks Zoo and I'd dropped Nevin and Nate off at the airport, yet another blizzard came through the area that plunged the temperature to a balmy -1 degrees F the following morning. It was bitterly cold as I spied across the hotel parking lot trying to find my rental concealed amidst the four-foot-high snowdrifts. As a kid who was born and raised in Tampa, Florida and settled in a town nicknamed "Hotlanta," I had found myself a long way from home.

What, you may ask, did poor Nevin and Nate do to have their architect schedule a sojourn to such frigid conditions in late February? I'd been invited by the GBCI to participate in a

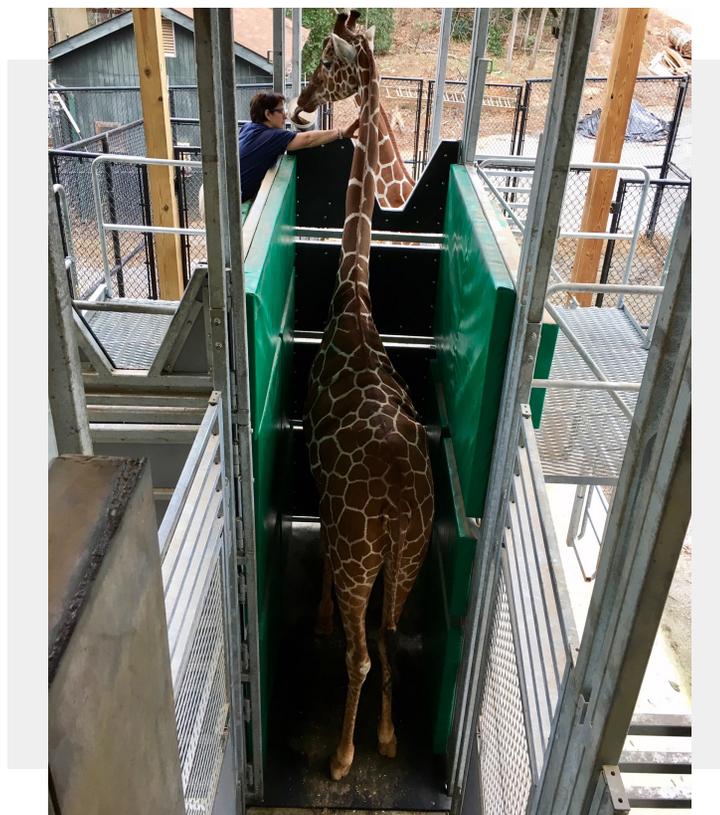
series of educational seminars at the Cleveland Clinic for Wellness that began the day after our trip to the zoo. The subject was a new program called the WELL Building Standard, a holistic certification protocol aimed at encouraging best practices in built environment design, operational management, and the modification of user behaviors to achieve greater human health and wellness. My firm also provided sustainability consulting services, and it was important to keep abreast of the latest developments in the field.



Little did I know that three years later I would reconnect with one of my former college professors from Georgia Tech, Dr. Terry Maple, at AZA Mid-Year in Jacksonville, and these two seemingly disparate worlds would collide again. Dr. Maple had the idea of re-designing zoos with wellness as their guiding concept. I realized that I might be the one architect in the free world that had done a multitude of exhibits for zoological species large and small and to also have expertise in wellness-focused design standards, albeit just for the human species. And so, when Jacksonville Zoo held a wellness summit in December of 2018, I found myself and Nevin, who had done many projects for Dr. Maple in his time at Zoo Atlanta, the sole designers in a room of zoo biologists trying to turn the corner from wellness as a powerful but abstract concept to an actual brick and mortar set of standards for zoological parks.

This paper reflects the outcome of nearly a year of thought and reflection about the topic as well as the cumulative principles of zoological design our firm, Epsten Group, has developed over the past dozen years. In that time, we've been fortunate to work on habitats for animals as small and delicate as the Australian Budgerigar parakeet to as large and powerful as the Sumatran Tiger and the African Elephant. Having begun

from the perspective of a design firm focused on sustainable buildings, I hope we bring a unique perspective and new voice to the zoo arena.



ZOO ATLANTA, AFRICAN SAVANNA

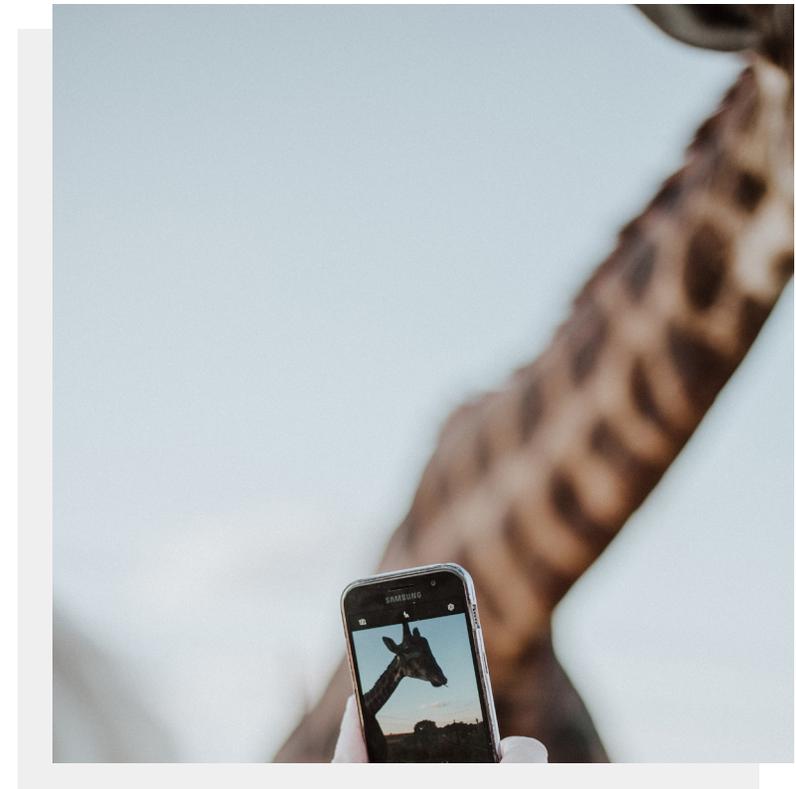
This is our manifesto, of sorts: imagining the next generation of zoological parks and gardens.

Signs of the Times

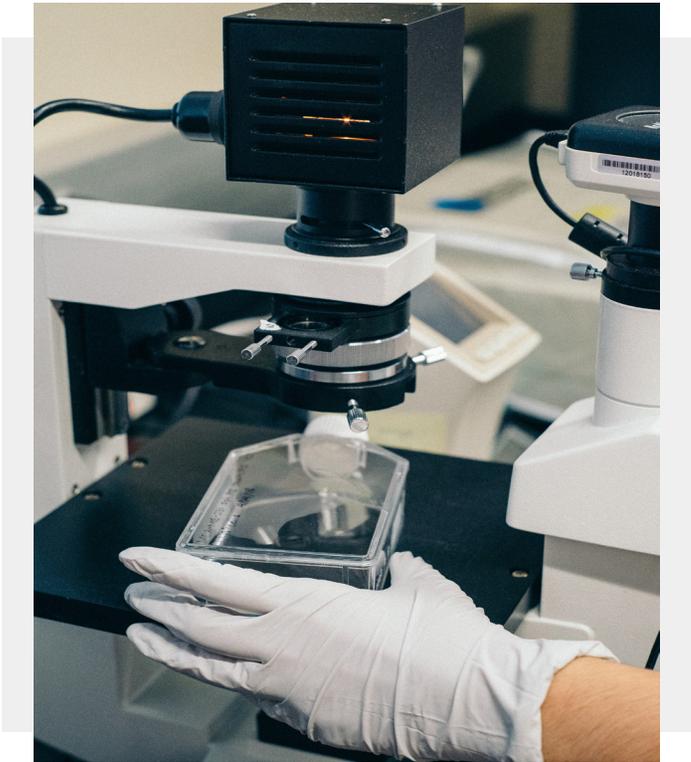
We live in a remarkable time where the proliferation and availability of knowledge has created a public that is more well-informed than ever before. Barriers like time and distance no longer keep information to a slow trickle. I can uncover on my smartphone in less than a minute the information it would've taken a trek to a library and a visit deep into the pages of an encyclopedia to uncover when I was a child. The ubiquity of information and the way that social media innovations have eroded institutional controls over the news that have led to unprecedented levels of transparency, voluntary or not, in just about every walk of life.

Zoos and aquariums have in no way been immune to the phenomenon. Whether dealing with an emergency event like in 2016, when a small child fell into the exhibit enclosure of a gorilla habitat or a 2013 documentary film that cast a harsh light on the practice of training and care for orcas at the Sea World amusement parks, the instantaneous availability of information about the zoo world's worst moments shifted the public conversation in ways that lead many to wonder aloud if zoos should even exist at all. Millennials, who have grown up fully immersed in this information-rich environment,

seem to be the most skeptical of all, creating a long-term threat to the viability of zoological parks and aquariums. How zoo designers, administrators, researchers, and animal care practitioners respond to this challenge will decide whether zoos have a future at all.



The First Two Waves of Zoo Design



To understand where we're going, it's important to look back at where we've been. To do so, I suggest we take a knee to Dr. Maple. In his years as a prominent voice in the zoological community, Dr. Maple oversaw the revitalization of Zoo Atlanta as CEO for an 18-year span in the 1980's and 90's, during which time he also maintained a career in academia that included teaching a multi-disciplinary Environmental Design class at the College of Architecture that included

students from diverse background that included architecture, engineering, biology, and psychology. When I took his class in 2000, my senior year of undergraduate study, I suppose we were at the crest of what he might call the second wave of zoo design.

In Dr. Maple's Book, *Professor in the Zoo*¹, he posits three distinct eras for our zoological institutions. In the first wave of zoo design, animals suffered under human dominion in menageries made of steel and concrete.

Hard architecture, the restriction of small spaces, and the denial of choice created physical discomfort and psychological pathologies for zoo animals that were nothing less than appalling by today's ethical standards.

This first wave, the era of zoos of suffering, lasted hundreds of years until the enlightened intervention of zoo biologists through organizations such as the Association of Zoos and Aquarium and the World Association of Zoos and Aquariums began to pioneer approaches to liberate zoo animals from the bonds of hard architecture.

¹Professor in the Zoo: Designing the Future for Wildlife in Human Care, by Dr. Terry Maple, published by Red Leaf Press in 2016

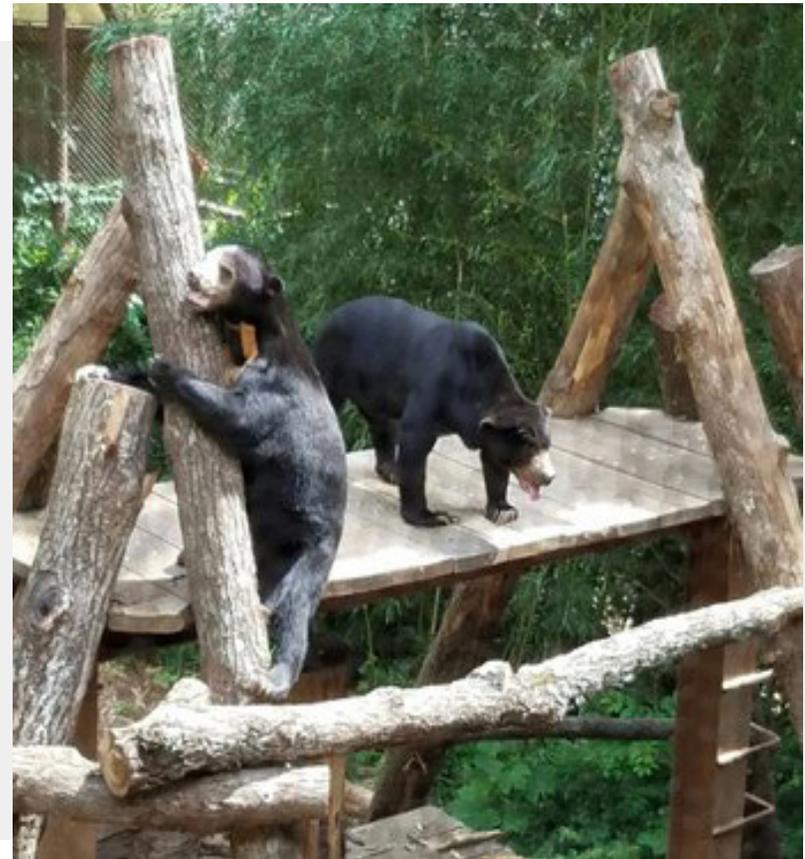
In the second wave of zoo design, zoos and zoo designers began to experiment with naturalistic designs that eliminated hard architecture and created exhibits where zoo animals could better cope with their captivity.

For the first time, zoological design focused as much, if not more, on the quality of living for the inhabitants of exhibits as it did the joy and amusement of the human observer.

These habitats were not perfect: zoo designers and biologists were just coming to grips with the immense size and complexity of the environments that animals really need to be their best, natural selves and the psychological and social dimensions of zoo design were still beginning to be understood. For instance, zoos struggled to appropriately exhibit animals in natural social groups as they would in the wild. Still, this second wave in zoo design was a renaissance compared to the unrelenting cruelty of the way zoos used to be.

Creating zoo habitats where animals are merely coping in captivity isn't good enough for today's skeptical public, though. Nor should it be. We sit on the precipice of a third wave in zoo design, but before we proceed, the public is, rightfully, asking the fundamental question of whether zoos should exist at all.

In the first wave of zoo design, animals were displayed and mistreated for the sole amusement of human beings in callous dominion over them. In the second wave of zoo design, we cleaned up the worst abuses of zoological design and began to design more ethical habitats, but we largely only achieved environments of coping. Is it enough?



ZOO ATLANTA, TRADER'S ALLEY, MALAYAN SUN BEAR HABITAT

A Stunning Admission

As a zoo designer who has worked with now dozens upon dozens of dedicated zoo biologists and an animal lover, I understand how the skeptical public feels. The truth of the matter is that simply coping is no way to live. Thus, I'll make a stunning admission: In a perfect world, zoos would not exist. In a perfect world, the sustainable balance of the planet would be maintained in ecosystems around the planet, and mankind and animal would live shoulder to shoulder in peace and harmony. We, however, live in a horribly imperfect world where animals in the wild face the following dangers every day, most of which continue to escalate at an unchecked pace:

- Climate Change
- Deforestation/Desertification
- Urbanization, Sprawl, and Habitat Loss
- Pollution
- Competition for and Scarcity of Resources Such as Water
- Illegal Trapping and Poaching
- War and Human Conflict



Many of the issues are not new. Indeed, the luminary conservationist Aldo Leopold wrote in the 1940s that:

“One of the penalties of an ecological education is that one lives alone in a world of wounds. Much of the damage inflicted on the land is quite invisible to laymen. An ecologist must either harden his shell and make-believe that the consequences of science are none of his business, or he must be the doctor who sees the marks of death in a community that believes itself well and does not want to be told otherwise.”²

-Aldo Leopold



ALDO LEOPOLD, COURTESY OF THE ALDO LEOPOLD FOUNDATION

If we're being honest with ourselves, and if we're also looking through Leopold's lens as ecologists, whole wilderness habitats are at best coping and at worst suffering under the strain of mankind's rapacious and thoughtless treatment of the land.

The decades of cumulative damage are leading to a series of calamitous tipping points, and simply walking away from the conservation and research missions of our zoological institutions would likely mean extinction for a great number of species large and small.

If the thoughtless dominion of the land by human industry has created a world in a perpetual state of suffering and pain, do we not have an ethical obligation to apply the best of our science and medicine through thoughtful and responsible stewardship to try to heal the damage and bring the world back into balance? And, if that is the core cause of the remainder of our century and I believe it is, zoos hold a frontline role in that mission.

² From Aldo Leopold's [Essay on Conservation from Round River](#), edited by Luna Leopold and originally posthumously published in 1949 after Aldo Leopold's death in 1948.

More Than Just a Zoo

If you accept the concept that the world's ecosystems are in pain and that humankind is duty-bound to deploy our best scientists and physicians to fix the damage that's been done, the next step is then to consider how to implement the necessary changes to achieve such a lofty goal. That's where the soup sticks to the spoon, after all.

In considering the conceptual shape of such an implementation plan, I'd ask you to consider how we deal with epidemic illnesses in our human communities. Whether dealing with an acute disease like some new and virulent strain of virus, or chronic issues like diabetes or heart disease, to curb acute outbreaks and spread the gospel about the benefits of preventative medicine and healthy lifestyle choices a whole array of scientists and physicians working for government agencies and NGO's provide urgently needed clinical research and educational outreach. They develop life-saving drugs and pain-reducing therapy regimens. They issue standards and guidelines for nutrition and physical activity for our children in our public schools. With our natural world in pain and our wild communities facing an epidemic of ecological challenges, I would ask you to consider that our zoological institutions are evolving

to take a role that is analogous to those institutions. Think of each zoo as a branch office of the Centers for Disease Control (CDC) for our wildlands. Think of AZA as the National Institutes of Health (NIH) for the planet.



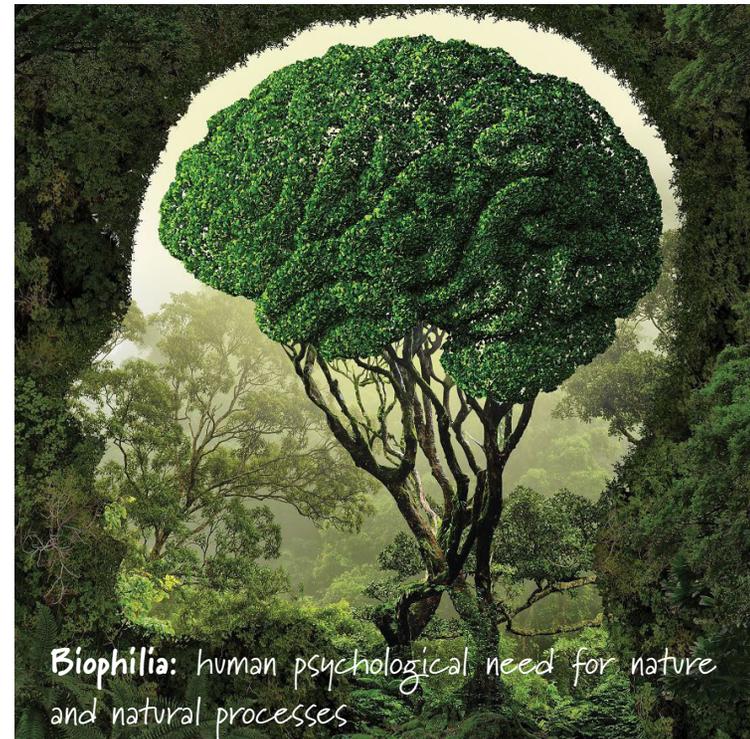
Zoological gardens provide a critical setting for conducting minimally-invasive research of animal species who are threatened or endangered in the natural world. Through the compassionate stewardship of zoo practitioners, we can scientifically ascertain the best evidence-based practices to improve health and well-being in our ecological communities, preserve imperiled strains of biological diversity, and devise the most effective ways to eventually return species to their optimal state in the wild once mankind finds the wisdom and political will to forge a more perfect world.

Cast in this frame, we can also begin to see how zoos form a critical resource within the human communities they inhabit. In a post-industrial, knowledge-driven world, the research laboratory is the new factory, and the brawn that once was used to make raw materials yield to human will is now replaced in importance by the research laboratory and the brains needed to find ways to stretch and re-use those same raw materials so human civilization can live in harmony with nature on an ever-shrinking blue planet in perpetuity.

With this in mind, research-driven, empirically minded zoological institutions and the boundless research opportunities they afford our young professionals are critical pieces of a thriving intellectual community's economic green infrastructure.

Zoos as green infrastructure also bring a host of other tangible benefits to a city, as well. As islands of lush vegetation in a harsh asphalt jungle, zoos provide the physical benefits of helping to control and infiltrate stormwater and reduce urban temperatures through the provision of shade and the natural processes of evapotranspiration. Additionally, zoos help fill our inherent human psychological need for nature and natural processes, called biophilia. In urban environments marked by a paucity of flora and fauna, naturalistic zoos help city-dwellers

reconnect with nature in a safe and controlled setting that can help reduce stress and improve psychological health. As a well-designed pedestrian amenity, zoos can also contribute to the physical health of a city's populace by creating a setting for walking and other moderate physical activities needed to reduce the rates of chronic illnesses.



Biophilia: human psychological need for nature and natural processes

The Third Wave of Zoological Design: Wellness-Focused Zoos



This sounds well and good, but at the end of the day, I suspect the skeptical reader is judging whether the benefits to our human health, economy, etc. are really an end in of themselves that justifies zoos where animals merely coping is the modus operandi. *Let me put that question to rest: they are not.*

Ethically speaking, we're compelled to design, build, and manage zoological institutions that transcend merely coping and provide environments where everyone thrives: animals, visitors, and even zoo administrators and animal care practitioners alike. No institutional model based upon the exploitation of any of its stakeholders is ever sustainable in the long run.³

Thus we forge ahead into the third wave of zoological design with the understanding it must be underwritten as a collaboration between our silent partners, the animals under human care, our zoo biologists, and the communities these zoological institutions call home.

³ Remember this concept, you will need it later.

In his soon to be released book, [Beyond Animal Welfare](#)⁴, Dr. Maple squarely proclaims that wellness is the central concept to this third wave of zoos: zoos where animals no longer suffer or are merely coping with their daily plights. Wellness-focused zoos shall be places where animals thrive physically and psychologically while in human care. It isn't difficult to ascertain the necessity of such a focus: in a world where information is readily available and, therefore, transparency is no longer an option and zoological institutions⁵ have no choice but to be transparent about their design and management strategies and an engaged and informed public *expects* that its community's zoos shall holistically provide the highest level of care to its animals possible.

If zoos want to win back a skeptical millennial generation, a fully and openly detailed commitment to wellness and ongoing refinement of animal habitats and animal management practices in every dimension will become the prerequisite for staying in the game.

The wellness gauntlet is already thrown: go big or go home.

We can think about the issue through a less academic, simpler frame, though. When you go to the movies, are you there to see the lobby and the snack bar, or are you there to see the motion picture? When you go to a sporting event like a baseball or football game, do you go to see the stadium, or do you go to see the athletes? In both examples, the public is paying to see the performers applying their crafts to the peak of their abilities. That's not to say the environment surrounding the performers is irrelevant. The movie-going public also expects a clean theater and restrooms, plenty of points of sale for concessions, and easy access for ticket selling and ticket taking. Likewise, the sporting fan expects a clearly visible scoreboard and a quality PA system within the arena.

These are all important secondary factors in the public's enjoyment, but at the end of the day they're there to see the movie and the players. If the movie is a comedy, if the plot isn't funny and the jokes don't work, the public won't be satisfied. If you go to root on your favorite football team and they're down by four touchdowns at halftime, it's likely the public will be heading to the gates early and unhappy. Likewise, people go to zoological gardens to see the animals thriving, and if they aren't, all the expensive faux rockwork and fancy interpretive displays in the world won't gloss over it.

⁴ Beyond Animal Welfare, by Dr. Terry Maple, published by Palmetto Publishing Group in 2019

⁵ Seriously, if the NSA can't keep its secrets off the Internet, do you really think your zoological institution has a snowball's chance of succeeding? Better to embrace the epoch of complete transparency that has been foisted upon us by technology and adopt a higher standard of practice which includes engaging in open dialogue with the public.

The Pivot

If we accept the conceit that the public expects, ethically, that the highest level of holistic wellness is provided for in zoological institutions for all of the animals under human care, the next question is, of course, what defines a baseline level of wellness we must achieve as a prerequisite and what are the metrics by which success and continual improvement judged?

Without a set of technical standards and tracking metrics, saying a zoo is focused on wellness and dedicated to its animals thriving is, functionally, just marketing spin. A goal without a plan is just a wish, after all.

This is where the strange confluence of my experience in the two worlds of zoological design and sustainability and wellness consulting came to the fore. To answer those critical questions and make the pivot from high-minded theory to successful practice, I suggest we look at the International Well Building Institute's WELL Rating System. The standard, which was rolled out in 2014 at the Greenbuild Conference in New Orleans, Louisiana, was the culmination of about seven years of collaborative development between some of the giants of the sustainable building and medical worlds. Participants in the effort included the Cleveland Clinic and NIH

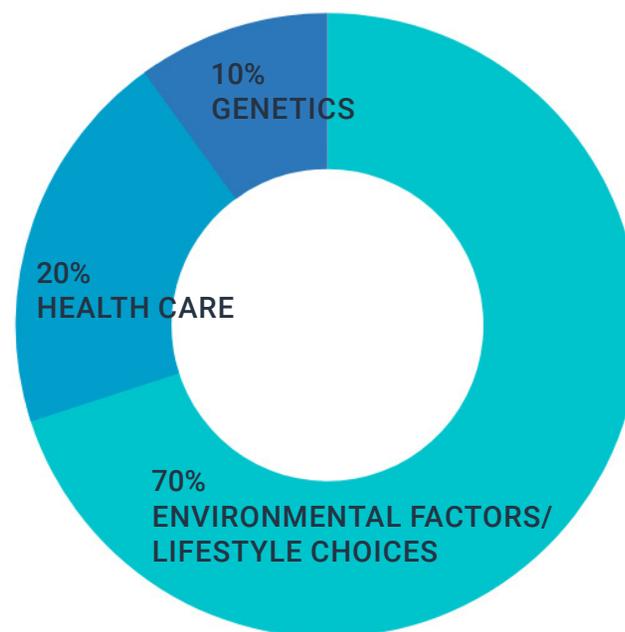
on the medical side, as well as the US Green Building Council and International Living Future Institute, which administrate the LEED and Living Building Challenge standards, respectively, from the green building side.



The macroeconomic argument for WELL buildings is easy to grasp. If we consider all the factors that influence human health and wellness, approximately 10% is the product of our genetics. Your mom and dad are your mom and dad, so you are stuck with your genes. Roughly 20% is tied to health care. It's the skill of your doctors and the quality of the medications and surgical procedures they have at their disposal. In 2018, the United States spent over \$3.5 dollars on health care, which is creeping up on 20% of the nation's GDP. The main drivers of escalating health care costs include the high rate of preventable chronic illnesses in the United States like diabetes and heart disease, and partisans from all ends of the political spectrum concede that the health care system we currently have simply isn't economically sustainable in the long run. WELL asks us to consider leveraging attention and investments against the other 70% of the pie as a way of preventing chronic illness and bending down the curve of escalating health care spending.

So much of your health and welfare depends on your environmental factors and lifestyle choices. It's in the air you breathe, the water you drink, and the food you eat. It's in your activity levels and the stressors that are or aren't present in your personal and professional lives. The prima facie argument for redeploying attention toward the largest piece of the health and wellness pie is, therefore, compelling.⁶

FACTORS INFLUENCING HUMAN HEALTH AND WELLNESS



⁶ The percentages in this paragraph are rough approximates presented at an IWBI educational presentation at the 2016 Greenbuild Conference in Los Angeles, California. There are other studies that suggest the influence of environmental factors and lifestyle choices may make up as much as 80% of human health and wellness.

When the development of WELL began long before its introduction in 2014, the green building world already knew about a constellation of scientific research on how built environment interventions affected human health, wellness, and productivity. Studies from the K through 12 educational arena by the EPA showed how the provision of healthy fresh air in classrooms reduced sick days and improved test scores. In the state of California, classroom surveys demonstrated how young pupils advanced faster in reading and mathematics in classrooms that had ample access to natural daylight. These studies were taken into account in the development of standards like LEED for Schools, but LEED was focused on reducing the ecological footprint of educational facilities. A standard focused squarely on human health and wellness still didn't exist, and that's the vacuum that the WELL standard moved in to fill.

The economic argument at the facility level is then also clear. For schools, the reduction in absentee days due to sickness for both students and faculty alike not only improved test scores, but it also reduced the operational costs of having to bring in substitute teachers. These schools also experienced higher rates of retention among their faculty, as well. Commercial offices looking to implement wellness-focused building see similar benefits as well as a magnet for attracting talent to

their firms in a competitive labor market, while speculative building developers and managers see a way of attracting and retaining more and better tenants.⁷

Again, I imagine the skeptical reader is saying that's all well and good, but...

What does a wellness standard written for one mostly hairless mammal species with opposable thumbs have to do with implementing wellness in zoological parks and gardens?



⁷ For more information about the WELL standard, check out the IWBI's website at wellcertified.com or reach out to one of the fine sustainability experts at our company, Epsten Group, at epstengroup.com (that's a commercial).

My experience with one foot in both the zoological and sustainable building world suggests to me that the zoological world is in a very similar place as the sustainable building world was when the WELL standard was just a gleam in its creators' eyes. There is, undoubtedly, a bevy of existing research and scholarship about built environment interventions and animal management best practices, as well as anecdotal institutional knowledge held by our zoos' keeper and curator staffs that speak to how we can improve the health and wellness of animals in zoos under human care. Nobody to this point, though, has begun the arduous task of compiling all that research, scholarship, and institutional knowledge and synthesizing it into a single, cohesive, comprehensive wellness standard.

Therein lies our challenge, which I believe will be the great project of an entire generation of zoo designers and zoological wellness practitioners.

The WELL standard, which applies to just a single species, is a complex set of over 100 design, operational, and behavioral preconditions and optimizations spread across seven conceptual categories. The zoological world must multiply that level of effort, which took roughly seven years in of itself, across hundreds of species that are cared for in our zoological institutions.

If that sounds like too steep a hill to climb, allow me to remind my friends in the zoo world: you have no choice.⁸ The skeptical public is demanding, but I believe it is also fair. It doesn't expect perfection, but it does expect the zoos in its communities to have detailed standards and plans outlining baseline levels of wellness that must be maintained in zoos and the establishment of cultures of continuous improvement where ongoing progress is measured and tracked through well-defined, scientific metrics. In a world where we are all swimming in information, our community stakeholders have the expectation that each zoo, at a minimum, will undertake the painstaking intellectual exercise to make sure that they're doing their level best to make sure that their animals are thriving.

⁸ AZA, on a surface level, seems to have acknowledged as such my making the creation of an animal welfare management plan with tracking metrics a requirement of maintaining zoo accreditation. The exact form of those welfare plans and metrics remains nebulous and will take shape over the coming years, and there's a semantic debate to be waged about whether welfare versus wellness is the end goal, but either way you cannot fight the future.

The Animals Don't Have Time to Wait

Unfortunately, we don't have the luxury to sit on our hands the next decade while the zoo world completes its first draft of wellness standards and practices. Important species like the majestic African Elephant are in urgent need of larger and better habitats today to meet the ethical minimums of a wellness-focused zoo.

What can zoos and zoo designers do in the interim to create good exhibits and help guide the discussion as these standards are developed?

The lack of well-defined standards is both a blessing and a curse. Absent a defined threshold for what constitutes the floor of wellness-focused design and guardrails to guide the technical requirements of a wellness-focused habitat can be intimidating. But, it allows us to think in blue sky terms about the topic of wellness, which invites innovation from all stakeholders involved in the process. In the early days of this third wave of zoological gardens, we can build our own thresholds and guardrails, test them, refine them, and then use what we learn to help inform the evolving standards for future projects.



PETE AT ZOO ATLANTA'S AFRICAN SAVANNA

In my presentation to the group at Jacksonville, I posited that the first step in developing wellness standards was to develop an overall framework methodology for collecting, sorting, and synthesizing existing zoological wellness research and institutional anecdotal knowledge. Because I knew its form the best, I suggested perhaps the feature categories from the WELL standard might be a good starting point.

Loosely arranged from physical to psychological needs like Maslow's Hierarchy of Needs, the WELL categories include Air, Water, Nourishment, Light, Fitness, Comfort, and Mind. I then suggested the inclusion of an eighth category governing standards for Reproductive wellness, which is unique for zoological institutions that often aim to produce and rear animal offspring.

By creating definable categories of the standardization process, appropriately sized and focused working groups could be developed to collect the research in each category and begin to translate that research into technical requirements for built environment interventions and animal management best practices.

WELL Categories:



Air



Water



Nourishment



Light



Fitness



Comfort



Mind



+ Reproductive Wellness

Similarly, I might also suggest considering the framework of Georgia State University's David A. Washburn PhD from his article "The Four C's of Psychological Well-being."⁹ Based on psychological research into rhesus monkeys, Washburn concluded there are four elements that had to be present for the animals to live in a state of psychological wellbeing:



Comfort



Companionship



Challenge



Control

Comfort largely encompasses the physical needs of the animal, Companionship its social needs, Challenge its need to constructively overcome physical and mental obstacles for stimulation and to build and maintain self-esteem, while Control speaks to animals having the freedom of choice.

Comfort largely encompasses the physical needs of the animal, Companionship its social needs, Challenge its need to constructively overcome physical and mental obstacles for stimulation and to build and maintain self-esteem, while Control speaks to animals having the freedom of choice.



⁹ David A Washburn PHD's "The Four C's of Psychological Wellbeing: Lessons from Three Decades of Computer-based Environmental Enrichment" was published in the August 2015 edition of the journal [Animal Behavior and Cognition](#)



Although the research underpinning the article applied to monkeys and apes, at a gut level the Four C's seem applicable to just about most animal species in the zoo.¹⁰ Given this framework originated closer to the zoological world than the sustainable building world, I can see it having greater appeal to zoo stakeholders.

Ultimately, I'm agnostic as to the exact form just as long as it's fairly comprehensive, encompassing both physical and psychological needs for wellness, and gives the design and management team a good starting point to organize their efforts.

In the wellness-focused zoo, designers can then work collaboratively with the staff's zoo biologists to develop a comprehensive slate of built environment interventions and facilities within each category and sub-category that supports wellness-focused animal management best practices. This process also must include a discussion about metrics for tracking the outcome of each intervention and best practice to ascertain thresholds that define initial success and create frameworks for ongoing refinement and improvement.

Over time, and with data obtained from the adoption of similar built environment interventions and best practices in habitats at other zoos, we can begin to create published, evidence-based, scientifically supported standards that will put all but the irrational skeptics' minds at ease about a zoo's core commitment to animal wellness.

To give a taste of what wellness-focused exhibits might be like, I offer the following narratives of potential African Elephant and West Indian Manatee Exhibits at Jacksonville Zoo and Gardens that we compiled coming out of our wellness summit and follow-up meetings:

¹⁰ Including human beings, for that matter.

Wellness-Focused Manatee Exhibit

Located near the front entrance of Jacksonville Zoo and Gardens, the new Wellness-Focused Manatee Exhibit is intended to immediately underscore the care given to animals at the zoo and its focus on health and wellness.

The exhibit includes two main elements: the relocated **Manatee Critical Care Center** for manatees which have been struck by boats and require immediate medical attention; and the **Manatee Tributaries** naturalistic permanent exhibit, where we imagine some of the manatees who come to Critical Care will be moved if their injuries are too significant to release them back into the wild.

The Manatee Critical Care Center will include an indoor interpretive room with underwater viewing into the care center's manatee tanks. The aesthetic will be a clean, hospital-like setting that highlights the veterinarian care the animals receive when they come to the zoo.

By contrast, the Manatee Tributaries portion of the exhibit will consist of a series of interlocking, naturalistic artificial river tributaries. The habitat will feature natural river substrates and vegetation and give visitors the chance to experience the manatees' natural environment through a series of boardwalk overlooks.

Wellness will be carefully integrated into the habitat through several different elements such as the provision of different temperature gradients, wave machines that provide hydrotherapy resistance to the animals, and other enrichment, including biodiversity in the form of native fish and turtles.



The contrast between the Manatee Critical Care Center and the Manatee Tributaries is intended to show manatees at all of stages of their wellness experience at the zoo from critical medical care after traumatic injury to thriving in a naturalistic setting designed to let them be the best and healthiest version of their natural selves.

Wellness-Focused African Elephant Exhibit

The crown jewel exhibit of Jacksonville Zoo and Gardens' Wellness Program will be its new Wellness-Focused African Elephant Exhibit. A bold expansion of the existing African Elephant Exhibit, this new habitat will establish the zoo as one of the foremost institutions for elephant wellness and research.

The exhibit will consist of three parts. The first will be an extensive expansion of the existing exhibit to include a brand-new state-of-the-art holding facility. The new facility will be LEED certified and designed for multiple herd groups and to accommodate breeding and rearing of elephant calves. The main exhibit habitat will then connect to two fantastic new additions: an elephant fitness trail designed to extend to an infinity pool located along the Trout River and an elephant habitat expansion to be located on new land acquired across Parker Avenue to the west.



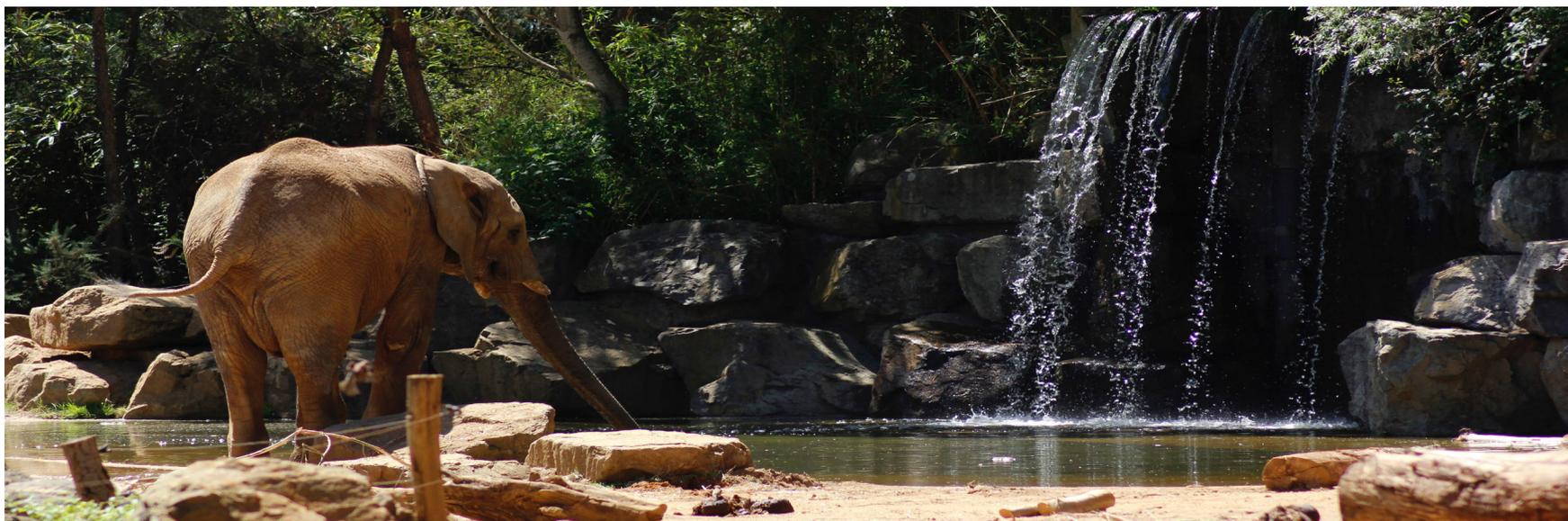
INSIDE THE ZOO ATLANTA ZAMBEZI ELEPHANT CENTER

The fitness trail to the Trout River will highlight the exhibit's focus on improving elephant wellness by actively encouraging a minimum of five miles of walking a day along with swimming and other enrichment activities designed to improve the wide array of fitness factors from endurance to dexterity.

The trail will also be designed for the use of other zoo species such as giraffe with a view toward making the trail a shared amenity that also leverages biodiversity as a way of increasing the variety and vibrancy of the habitat spaces. This flexible concept will also be the hallmark of the re-design of the Africa section of the zoo, allowing seamless rotation of species and even naturalistic mixed-species exhibit scenarios.

The expansion area across Parker Avenue to the west offers an exciting opportunity to have multiple habitat areas that are expansive enough to allow elephants to form and live in herd groups just as they would in nature.

The positive impacts on the mental health of elephants in the herd and the potential benefits to the zoo's new breeding program are likely to be incalculable. Additionally, this new habitat area may offer the zoo the impetus for creating a new nighttime safari program with a view toward expanding the hours in which the zoo can fulfill its education and research mission while also adding a new revenue stream for the institution.



Facilities to Support the Mission



In nearly 12 years of working on zoological projects across multiple zoos, one of the things I'm always struck by is the generosity and selflessness of their keeper and curator staff. In just about every project I've ever worked on, we've tried to include elements to help support these zoo biologists in their everyday routines.

Spaces for basic hygiene like shower and changing facilities and convenient restrooms. Spaces for convenient storage and preparation of food for the animals. Even providing something as simple as a well-placed viewing window and some counter space to write research notes is something we've always tried to incorporate into our projects at Epsten Group. But, whenever budgetary pressures arise, as they often do, these simple, supportive design gestures are almost always the first to be value-engineered out, willingly, by the zoo team.

Given the choice between spending a dollar on the animals and spending a dollar on themselves, zoo staffs will almost always choose the animals under their care.

This phenomenon occurs at a time when the role of keepers and curators continues to expand exponentially. Take our friend Nate Elgart at Zoo Atlanta, for example. In addition to managing his team to make sure the physical tasks of cleaning his elephants' habitat and holding facility and the basic hygiene and physical care tasks for the animals themselves, the traditional role of a keeper, Nate can also be found at any given time observing the animals and jotting down research notes, giving a keeper talk to zoo visitors, or playing the star of Zoo Atlanta's YouTube and other social media channels.



ZOO ATLANTA, ZAMBEZI ELEPHANT CENTER

In a wellness-focused zoo, which is what just about every zoo in the United States is trending toward, whether they know it or not, he's also charged with participating in the various tasks of evaluating and tracking health and wellness such as monitoring weight, dietary supplements, medication, etc., in conjunction with the zoo's dedicated veterinarian staff.

It's for that reason that I'm glad our recently opened Zambezi Elephant Center includes a fully functional keeper office that includes an overlook of the interior stall spaces from which observations can be taken, ample office space, shower and changing facilities, a kitchenette so they can microwave a quick lunch, and a laundry area for cleaning soiled clothing. These aren't niceties afforded to bourgeois zookeepers. They're basics that should be afforded to staff who are no longer accurately called "zookeepers." In the wellness-focused zoo, everyone is a "wellness practitioner" and should be supported as such by the institution, including the provision of appropriately professional facilities.¹²

In a wellness-focused zoo, no one suffers or just gets by coping. Everyone thrives.

¹² Remember what I said about footnote #3? Look, it's not in my pay grade to talk about what keeper and curator staffs are compensated for their work. But, it is somewhat in my bailiwick to suggest there are certain bare minimums in the quality of facilities for these staff that are essential to supporting them and all that they do. Too many of the wonderful keepers and curators I've had the opportunity to work with over the years have been coping with sub-standard support spaces out of a sense of self-sacrifice for the good of the animals in their care. In a wellness-focused zoo, though, no one suffers or just gets by coping. Everyone thrives.

One of these facilities is what Dr. Maple has dubbed the Wellness Center. Comprised of both public-facing interpretives and exhibits and back-of-the house support spaces, Dr. Maple's conception of the Wellness Center is a three-story mega-complex. In my conception of the Wellness Center, though, it splits roughly between the more back-of-the-house Wellness Center, which is actually small complex that includes a Wellness Administration Building and the zoo's Wellness Nutrition Building near the front gate of the zoo and a public-facing Wellness Interpretive Pavilion along the Trout River overlooking the rotational infinity pool habitat where African Elephants, Giraffe, Rhino, and other species can be shifted to for exercise and enrichment.

Although the bulk of wellness-oriented activities and research will necessarily take place within the animal habitats in our new wellness-oriented zoological gardens, this new wellness paradigm also requires an investment in improved support facilities for keeper and curator staff. From these facilities, zoo professionals can monitor wellness goals, coordinate research activities, refine built environment innovations and animal management policies, and collaborate with fellow staff.

Consisting of a Wellness Administrative Building and a Wellness Nutrition Center, the Wellness Center at Jacksonville Zoo and Gardens would be a vibrant, first-of-its-kind model that we hope would be replicated in zoos around the world.



I also envision the Wellness Center to be a tranquil setting for zoo staff away from the public-facing exhibit habitats. Toward that end, the Wellness Center will be tied together by an elevated deck with a number of informal outdoor seating areas looking out on the borrowed landscapes of the Wellness Nutrition Center's Chef's Garden and the new Wellness-Focused Manatee Exhibit tributaries. The goal would be to create outdoor spaces that reflect the laid-back architectural heritage of Florida and provide staff a place to de-stress during lunchtime or in between other work tasks.

Wellness Administration Building

Implicit in the wellness model for zoological gardens is a recognition of the enlarged role that zookeepers and curator staff continue to take in the modern zoo. Zoo staff are no longer merely operations and maintenance staff who “scoop the poop” and wash down holding buildings. In today’s zoo, they are often on the front line of biological research, the focal points of visitor education programs, and their close relationship with the animals under their care makes them uniquely attuned to their health and wellness.

The new wellness paradigm requires a recognition that all zoo staff now have elevated roles as wellness practitioners and need the facilities and support necessary to successfully carry out an ongoing mission of continuous improvement and innovation. Just as new wellness-focused habitats must be designed to let animals be the best version of themselves and thrive under human care, our facilities for zoo wellness practitioners must be designed to let staff thrive and be the best versions of themselves as professionals.

The Wellness Administration Building at Jacksonville Zoo and Gardens is conceived to do just that. Designed with the quality of a facility at a higher-education institution, the building will

have spaces and technologies to assist in ongoing research activities with vibrant working settings that will help stimulate collegial collaboration and spark innovation. It will also house support amenities such as a dining area, shower and locker facilities, and a small gym, because in order to provide the highest level of care possible to the animals under their care it is important for the wellness practitioners to also take care of their own health and wellness, too.

Some key elements of the design are as follows:

A. The Monitoring Room

The Monitoring Room is a large collaborative workroom with several large video screens from which zoo researchers can remotely and collaboratively conduct research on any exhibit within the zoo. The technology supporting the space may include access to cameras within zoo habitats, GPS tracking technology, accelerometers, and other data collection methods that will allow researchers to collect and quickly aggregate performance metrics for every animal in the zoo without the use of invasive research techniques.

Within the space, researchers will also have fingertip access to the zoo's medical and nutritional databases and state-of-the-art videoconferencing and data-sharing technologies that will allow wellness practitioners to network and collaborate with other zoo wellness centers and research institutions around the world.

Because the space will be fully wired to monitor the entire zoo campus, we conceive of the Monitoring Room doubling as the zoo's Resiliency Command Center in the case of potential disaster scenarios such as hurricanes or tropical storms. Constructed from reinforced concrete and fitted with high-strength storm shutters at window openings, the Monitoring Room will provide zoo administrators a protected location to assess damage during and after an event and quickly coordinate relief and recovery efforts with first responders. This dual-functioning space will also be a first-of-its-kind innovation for zoos that we hope is replicated throughout the world.

B. The Activity-Based Office

For the past several decades, designers and administrators have struggled with the problem of providing ideal office space for their staff. The older paradigm of providing private offices for staff stunted collaboration and often led to creating organizational silos that discouraged collegial interaction and innovation. Some research in work environments suggests that as much as 90% of important communication in the workplace occurs outside of defined communication or decision-making mechanisms and instead takes place through informal interactions in informal spaces. The older model failed to provide enough of those open, informal spaces. Conversely, ample research has also shown the failure of the open office concept, which may provide an improved setting for collaboration, but also poses too many distractions that ruin the efficiency and productivity of workers attempting to complete focused tasks.

For the Wellness Center, we've suggested harnessing a new design methodology for spaces that we believe provides the best of both older approaches. In Activity-Based Offices, we design several workplace settings and allow workers, now untethered from their desks with laptops and tablets by wireless networking technologies, to choose workspaces that best fit their tasks at hand and their own personal work styles.

Activity-Based Offices may have some mixture of the following types of workspaces:

1. **Library-Type Environments:** These are quiet spaces for focused, intensive work and may consist of any number of traditional, formal conference and meeting rooms spaces and/or private offices. They may also consist of less traditional one to three-person small “heads down” rooms or work pods.
2. **Living Room-Type Environments:** Open and comfortably furnished spaces with no designated function that are designed to be appropriated for impromptu collaboration and work.
3. **Pub-Type and/or Playroom-Type Environments:** Magnet areas designed to attract workers for small gatherings and collaboration. These may include breakroom amenities such as cappuccino machines or snack dispensers.

We conceive of the Wellness Center office space as being a mix of traditional and non-traditional workspaces where staff are given the choice of their working environment. Because of the transient nature of the building’s users, given that most work and research will take place during the day in the zoo,



MEERKAT EXHIBIT, ZOO ATLANTA

only a minimal number of formal private offices and assigned workstations will be provided for administrators and visiting researchers. All other staff will be able to choose between a mixture of traditional conference and meeting room spaces, open office spaces, non-traditional head-down spaces, or appropriating other living room and pub-type spaces in the building that will include an open break room and research library. Whatever they choose, these spaces will have ample natural daylight and views and biophilic elements designed to provide staff an invigorating and positive work environment.

C. Research Laboratory and Yard Space

To provide maximum flexibility to Wellness Center research activities that may need to physically occur at the building, we will provide a number of laboratory spaces that are divisible by movable partitions. This will allow the zoo to reconfigure laboratories to suit the research activities taking place in the center at any given time. Likewise, we conceive of a unique reconfigurable yard enclosure designed to house species of multiple sizes and types during research activities.

Wellness Nutrition Building

Obviously, one of the most important elements to animal health and wellness is the quality of their diet. Having a state-of-the-art facility for the storage and preparation of nutritional supplements is vital for the Jacksonville Zoo and Gardens' Wellness Program. Toward that end, we are proposing a separate Wellness Nutrition Building adjacent to the Wellness Administration Building. The separation is intended to avoid any cross-contamination of food supplies between the break room area in the administration facility and the food preparation area in the nutrition facility. Both buildings, however, may be envisioned to utilize the same loading dock.



The Wellness Nutrition Building shall also have a visitor's interpretive room that will highlight the nutritional aspect of the zoo's Wellness Program. In addition, we envision a space next to the building for a Chef's Garden.

Although the horticulture staff at the zoo will raise nutritional staples for the animals at a larger back-of-house facility, the Chef's Garden will serve as a small-scale demonstration farm under-scoring the horticulture staff's efforts. The Chef's Garden will also allow the zoo to provide educational demonstrations of urban farming techniques, which are becoming more prevalent in urban areas to fight the problem of urban food deserts such as those found in Northwest Jacksonville. The Chef's Garden may demonstrate several urban farming techniques ranging from traditional container planting to aquaponics and aquaculture.

Wellness Interpretive Pavilion

Located adjacent to the elephant trail infinity pool along the Trout River on an elevated, covered pavilion deck, the Wellness Interpretive Pavilion is the capstone visitor-facing element of the Jacksonville Zoo and Gardens Wellness Program. Consisting of a program that includes a wellness theater/lecture hall and dedicated exhibit space on an elevated boardwalk deck, the pavilion will summarize the Jacksonville Zoo and Gardens Wellness Program through a series of interactives that explore all the dimensions of wellness from environmental factors like air and water to lifestyle choices like nutrition and fitness. The interactives will also take great care to explore the mental health element of the Wellness Program by educating guests about how habitats are designed to promote animal choice and enrichment through overcoming challenges.



The building will also, along with its deck, have rentable events space with gorgeous views over-looking the Trout River to the south, the elephant fitness trail and infinity pool to the west, and the zoo's existing boardwalks and gardens to the east. The Pavilion is intended to have a strong architectural design aesthetic in line with other prominent Florida cultural waterfront buildings, and its design, detailing, and material selection should also call out to the same aspects of the Wellness Center near the zoo's front gates.

In conjunction with the above narratives, I recommended the zoo adopt the following policies for the future design and construction of facilities:

1. Moving forward, all zoo administrative facilities with conditioned space of over 10,000 square feet shall be WELL certified.
2. Moving forward, all zoo facilities with conditioned or semi-conditioned space of over 10,000 square feet shall be LEED certified.
3. Moving forward, all animal holding facilities at the zoo shall voluntarily comply with the fire suppression provisions of NFPA 150: Fire and Life Safety in Animal Housing Facilities.

We became aware of NFPA 150 in our African Elephant habitat when the City of Atlanta adopted the standard during our design process and made us the first project under its jurisdiction to test out the standard.

Written in response to the tragedy of a large horse stable that caught fire in the 1970s without adequate fire protection or means of escape for the horses, NFPA 150 attempts to address life safety for animals under human care just as the code already does for human beings.

In many cases, this requires the sprinkling of animal holding facilities and the development of specialized evacuation plans for the animals in the case of a fire. NFPA 150 still has its rough edges and zoo institutions will have to work together with municipal code enforcement agencies to iron out its kinks, but the ethical justification of its implementation is matched by avoidance of potential tragedy in the event of a disaster and the subsequent negative impacts on a zoo's public image.

It's for that reason, I suspect, that the National Zoo in Washington DC has already voluntarily chosen to comply with the standard. It would be unsurprising to me, despite the added first cost to projects, if many enlightened zoos starting following suit. Indeed, in our new Galapagos Tortoise Exhibit at Oklahoma City Zoo and Gardens, Dr. Dwight Lawson asked us to voluntarily comply with the sprinkling provisions of the code given that the animals are too large to be carried out of their holding building in the case of a fire by first responders. In a very basic way, this push to improve life safety for animals under human care shows how today's zoos continue, on their own inertia, to move toward a more wellness-driven philosophy.



OKLAHOMA CITY ZOO, GALAPAGOS TORTOISE EXHIBIT

Closing Thoughts: The Crest of the Third Wave

With all the above in mind, then, I ask your indulgence as we consider the zoo of the future, say, some 30-40 years hence. Think of a decentralized zoo that is fully intertwined within the landscape of a dense, pedestrian-oriented city. Spread out like wonderful green tentacles into the urban landscape, the lush vegetated habitats merge seamlessly with the network of recreational trails and playgrounds, as well as a series of constructed wetlands and urban wildlife preserve areas that not only establish protected areas for native wildlife, but actually serve to naturally and sustainably treat the wastewater from the surrounding city blocks.¹³ The zoo habitats themselves? Designed with the goal of biodiversity and flexible species rotation in mind, conceptually think of a gorgeous emerald necklace of green habitats with species free to move sequentially from gem to gem: each naturalistic habitat designed to provide optimal health and wellness and research opportunities for young scientists and physicians looking to unlock the secrets of a new, sustainable world.



¹³ This technology is actually not new. The city of Arcata, California completed a series of constructed wetlands in 1986 that treat the city's wastewater and create a wildlife preserve and parklands that many city residents aren't even aware is the system by which their sewage is naturally and sustainably handled.

Don't think of a zoo that is a walled fortress in a hostile urban realm. Think of a zoo that breaks down both the physical and institutional boundaries of the zoos of the past that is fully integrated within the urban landscape in every dimension. Think of how it can be intertwined with the economy of a post-industrial, knowledge-driven metropolis as the greatest living laboratory short of the wilderness itself. Think of how it can seamlessly function as a vital piece of physical infrastructure, helping to keep the hydrological balance of the land, treat our wastewater, and serve as a conduit for human-powered transportation in a less car-dependent society. Think of how it can embody the heart of a community, providing cultural and educational opportunities for all while fulfilling our biophilic need to gravitate to nature and natural processes. Think of how it can embody the soul of a civilization, by ethically heeding the call to provide the highest levels of health and wellness to the animals in its care and embracing the challenge of creating a place where all stakeholders: animals, zoo wellness practitioners, and the public alike, can thrive.

Interested in how we incorporate animal wellness into our zoo design projects?

Contact our experts: in@epstengroup.com

