## CHAPTER TEN - LESSONS LEARNED.

**Introduction.** Back casting over four score years of active life and three score years of formal education, travel and work what have I learned? I will begin with suggested foundations, problems and opportunities, my definition of “good design” and design process, visions of zoos of the future and finish with some parting advice for global generalist designers. While some of this advice is directed towards the specific field of zoo design, most applies to planning and design in general and environmental design in particular.

**Years of intensive travel.** An important lesson is that those engaging in this type of work must expect significant time spent in airports and on overnight flights. In 2007, for example, I made eleven international trips, followed by eight in ‘08, six each in ‘09 and ’10. As a more extreme example, in 2013 I recorded 120 days of international travel including South Africa, Afghanistan (two trips), USA (two trips), Brazil, Indonesia (two trips), plus many flights around Australia. I have circled the globe on two occasions. As international travel connections become more available and convenient and especially as online communication to even remote areas improves, it is likely that both national and international travel time will be reduced in the future. Nevertheless, there is no substitute for being on the ground with local colleagues learning firsthand from both the landscape and the people you are serving.

**Ethical foundation.** Even as a student you can ask yourself where is my North Star? Who do I serve? Design objectives can be achieved meeting client’s needs, but are these needs and is this design worthy? Does it also serve the diverse needs of wider stakeholders, people, animals and wild nature? What is the measure? Worthy design is founded upon your **ethos**, your character, as demonstrated by your work, guiding beliefs, attitudes, and aspirations. What are your ideals? **Pathos**, your passion and **Logos**, your logic and knowledge, are also essential to success, but they are guided by **ethos.** Perhaps it is easier for a senior practitioner to view these considerations retrospectively. However, students and emerging designers will benefit from exploring such questions throughout your careers.

These ethical epigrams, mottos and admonitions have guided me.

- *“Collaborate in the creation of delightful and sustainable habitats for people, plants and animals.”* This is how I described my work on my website.
- *“Exceed expectations!”* One of my favorite mottos.
- *“Good design joins inspiration, empathy, and science in service to someone or something.”* I’ve used this assertion in several academic papers to remind scientists there is more to design than fact-based policy and to caution designers to support their claims with evidence.
- *“The future is not some place we are going to, but one we are creating. The paths to it are not found but made, and the making of these pathways changes*

*both the maker and the destination."* Dr. Peter Ellyard "Commission for the Future. I use this quote to introduce planning reports.

- *"Ultimately, the goal of sustainable landscapes is the transformation of culture – the taming of technology, the emergence of a new environmental ethic, a new measure of life quality, and a substantially broadened sense of community including not only humans, but all of life."* Robert Thayer (1994)[1]

**Absolutist or incrementalist?** What is your stance on things you want to change? Appling the philosophical (and not the political) use of these terms, these quotes are from two excellent zoo design absolutists.

*"Rather than settling for incremental, iterative improvements, it's essential to seize the rare opportunities each new habitat represents to take a fundamental leap forward in animal welfare."* Jake Veasley - Care for the Rare. Jake once told me:" *Do it right, or don't do it at all."* Available time, financial and technical resources, policies, staff, design and construction capacities all place limits on achievable results. Sometimes, when finances, knowledge and human support resources are limited, the best result, according to Jake, is to *"Do Nothing."*

*"Don't copy other zoos. They have nothing to teach us. Nature is the norm. Copy nature."* David Hancocks.

My first encounter with this design philosophy was when I met David Hancocks in 1975 to collaborate on the Long-Range Plan for Woodland Park Zoo and their gorilla exhibit. I began the project wanting to make the zoo better, based upon improving zoo facilities. David the absolutist admonished us to forget what other zoos had done and seek answers and inspiration from nature. Dennis Paulson, our ecological advisor, and Grant Jones, our nature poet, became excellent guides. Thus, the gorilla, African plains and other exhibits we designed revolutionized zoo design theory and practice by doing it right following nature. We compromised by improving the animal's overnight accommodations areas better than other zoos had done, but not reconceptualizing them as we had done with exhibit areas. It didn't occur to us then to reinvent these areas as well. Today, designing for optimal animal welfare day and night in all seasons is a preoccupation of mine. I am pleased that many of the previously described projects I contributed to with Jones & Jones and CLRdesign, were all-or-nothing projects, especially the gorilla habitats at Zoo Atlanta with Terry Maple, Northern Trail at Woodland Park Zoo and the Zoo360 overhead trail systems done with Andy Baker at Philadelphia Zoo.

The more zoo exhibits I helped to design, the more I became an incrementalist when I believed it necessary. The results will be great improvements, if not optimal. As an example, in 1999 I chose to help design the new elephant exhibit at Taronga Zoo in Sydney, knowing their area was not large enough and their management system was not ideal. David Hancocks, the absolutist, publicly opposed moving young elephants

[1] Thayer, R. 1994, Gray World Green Heart, John Wiley & Sons, Inc., New York.

from Thailand to this new exhibit and to the new elephant facility at Melbourne zoo in 2006 on the grounds that neither zoo could provide an ideal new facility and management program for these young elephants. To the contrary, my design at Taronga Zoo and the excellent design of the new Melbourne facility introduced groundbreaking innovations such as aquatic-aerobic exercise to zoo elephants (Taronga Zoo) and elephant rotation (Melbourne Zoo). My design also allowed the zoo to eventually transition to an ideal management system. My incremental approach provided a very good (but not ideal) home for these elephants for twenty years, until they were relocated to join the large herd at Western Plains Zoo. The same can be said for the elephants at Melbourne Zoo where three elephant calves were born. This growing herd has now been moved to a very large new facility at Werribee Open Range Zoo. Thus, I supported incremental growth over time.

I regret some mistakes I made designing improved exhibits which were still too small. I should have opposed the unrealistic requirements of some zoo clients trying to fit too many species in too small a space for example. Even incremental improvements must be significantly better than previous conditions. But overall, I am pleased my incremental approach did much good, while I support the absolutists for demanding an ever-higher standard of zoo design and animal care.

**Problems and opportunities.** It is easy to remember barriers encountered and list them as problems. Seeing them as opportunities is more difficult and more useful.

**Innovation** is one of my passions when it supports my ethos of solving real needs with broad-based benefits and long-tern sustainability. What are some of the problems I have encountered obstructing positive progress through innovation?

**Fear of failure.** From infancy we are taught not to be wrong according to prevailing standards. “Colour within the lines of the coloring book. Spell words correctly. Know your place.” Fit in your socially, educationally and economically predetermined box. Failure to comply with one-size-fits-all rules is to be avoided. Failure itself is to be avoided. Yet failure is the natural cost of learning in the “learn-by-doing” growth model. Today we hear much about the importance of developing resilience, yet resilience is simply the ability to overcome failure resulting from obstacles and setbacks. I clearly recall three professional situations were fear of failure obstructed innovation.

- When first working with Zoo Director Howard Hayes on planning new exhibits for the Pittsburgh Zoo in the 1980’s I suggested an innovative exhibit idea. Howard’s immediate response was: *“Where has this been done? I wouldn’t want to have anything to do with it if it didn’t work!”*
- During a planning workshop at the Al Ain Zoo in Abu Dhabi I suggested a novel advance in facility design and animal management. One colleague on their advisory panel and director of operations at one of the world’s major zoos, responded: *“I don’t like change. Change causes problems!”*

- *“Why risk it.”* While designing the chimpanzee exhibit at Detroit Zoo I had specified planting thousands of horse radish roots to create a tropical appearance at ground level. The zoo veterinarian found a single citation of toxicity from this plant when fed to hogs by the bushel. I countered that horse radish is a staple of many human cuisines with no concerns of toxicity. Her response was: *“Why risk it. Have them all removed.”* Many of these plants survived and have not caused any damage to my knowledge. Many animal management standards are directed at removing all stress and danger to zoo animals, when overcoming obstacles is essential to developing natural competence and avoiding welfare dependency.

**Copies of copies.** In my travels and in some cases while studying at Harvard University, I encountered educational systems based upon the old master-disciple model. Students copy the master until eventually becoming a master themselves. When teaching at the university of Pennsylvania there was a talented Thai student from this educational heritage. During one of my class studios, he kept coming up to me asking: *“Is this how it is done?”* I would reply that this was his project to design. He must decide the best way to solve this problem himself self.” He could not understand that he had permission to be creative in his own way and continued to come up to me several times with the same question: *“Is this how it is done?”*

Thus, it is no surprise that many zoo and other facilities are nearly direct copies of earlier models. I expect this is a problem in most fields. Both failure and learning are minimized by copying. Confidence and courage are required to pioneer. Earlier examples of our work at zoos in Seattle, Atlanta, Los Angeles and Louisville are examples of successful innovation. My 2012 North American Zoo project tour confirmed their success over decades of use and generations of operators. Afghan colleagues confirm our innovative initiatives in eco-planning and sustainable land use continue to spread despite Taliban takeover, and UNEP departure.

**Best practice** is defined as methods accepted as being most effective. I once received a project brief from a prospective client stating: “We aspire to best practice”. This was a limiting aspiration, an admission they were below par with only enough ambition to catch up with the standard. During my years with Lombard North Planning in Canada, Jones & Jones and CLRdesign in the USA, it never occurred to any of us to catch up. We aspired to break new ground exceeding all existing standards, especially among zoos. We invented best practices without considering it.

Once, feeling a little overconfident, I suggested to a client in Dubai that we could deliver his design at any of four levels.

- Business as usual, we will suggest someone else for this work.
- Best practice, a twenty-year-old revolutionary idea the field has caught up with.
- Cutting edge, emerging concepts being tested in one or two other facilities.
- Next generation. Untested ideas we have developed on the drawing board.

In my experience, the time between when we introduced a positive zoo design innovation such as landscape immersion or animal rotation and it being followed by another zoo, other than our own clients, was seven to ten years. By the time this innovation was accepted by the zoo industry as “best practice” was apt to be one-two decades. Therefore, if you follow best practice you may be following a ten-to-twenty-year-old idea. Newspaper photos of the “Tiger Crossing” bridge and elevated trailways we designed for Philadelphia Zoo in 2016, went viral. It was copied immediately and globally, yet I doubt it is considered best practice in standard manuals today nine years later.

**Inflexible standards.** Standards in all fields intended to remove poor practice also perpetuate existing practice and impede innovation. Standards favor the average and create an acceptable norm while blocking both the worst and the best.

- Standards tend toward requiring higher levels of performance over time. If your plans barely meet today’s standards it is likely your facility will soon be obsolete.
- National standards are set by panels of industry leaders, often from the major institutions with personal and commercial interests, not to make their own facilities obsolete. Alternatively, standards are set by government regulators focused on eliminating offenders rather than encouraging progress. These are rarely updated.
- Area standards for animal exhibits seem to be set within the range of what zoos have provided and can reasonably expect to develop rather than what animals need based upon suitable natural wild habitats.
- Area and other standards are based on present industry practice rather than independent scientific inquiry.
- While standards are clearly noted as minimums, many designers and clients use them as practical sizes, something I have also been guilty of in the past.
- Most animal enclosure standards are given in areas rather than volumes. Square meters of usable areas may be a useful measure for terrestrial giraffes. Volumetric measures would be much more useful for arboreal animals, birds and aquatic species.

**Inability to visualize the unfamiliar.** Like all youngsters I grew up seeing the world in certain ways, confident that everyone saw it the same way. It was not until my college years that I realized some of us see novel concepts first in mental pictures we manipulate, seeing from many angles and positions or as imagined walk-throughs and then translate and communicate these images into words and illustrations. This is a capacity often ascribed to dyslexics like me. Others first read, see, or hear descriptions and piece together images. Of course, individuals vary widely in their capacity in both areas. While it is the designer’s responsibility to communicate effectively to the client, the inability of a client or user group to visualize the designer’s intent can become a hindrance to progress. One counter to this problem is the client’s trust in the designer’s mastery and character. Looking back, I recall great clients like David Towne in Seattle, Washington, and Satch Kranz in Columbia, South Carolina, who I’m sure didn’t clearly

understand the pioneering and even daunting innovations being proposed yet put trust in their designers and were well pleased with the results.

**Design professional as artist.** A perennial trend occurs when architects, landscape architects and other design professionals see themselves as artists. This embodies the flawed assumption that as designers we first serve ourselves for the good of those affected by our work. This philosophy presupposes elite designers know what is best for society. This is the elitest-modernist approach I resisted as a student at Harvard Graduate School of Design. Fortunately, many of my professors had a more modest and service orientated approach to design.

Artists use clients and benefactors to achieve the artist's own needs and vision. Design professionals are service providers. Our work is to help our clients satisfy their own needs and obtain their own visions. For design professionals, "artist" is an honorary title awarded, it at all, by users in appreciation for excellent work, beautiful in concept, application, and use. The best service is to design with rather than for clients, including cultural, animal and landscape clients.

**Styles du Jour.** Novelty drives sales. Planned obsolescence drives sales of the new, while fueling the failing throw-away economy of limitless growth. This is as true in architecture as it is in clothing fashion, sporting equipment and cosmetics. Too often design schools and journals support the latest superficial styles or today's hero designers rather than taking a deeper dive into discovering the most humane, functional, delightful, and sustainable design outcomes.

**Generational exceptionalism**, the fallacy that everything designed by the last generation was false and wrong and everything designed by your generation is true and superior is a driver of change. Does this result in useful change or just another style du jour?

**Management styles.** Top-down management speeds up work and supports or limits creativity based upon the risk profile of the leader. Also, their approach may be somewhat one-sided, depending upon their areas of interest and expertise. Several dominant zoo directors (we called them 'silverbacks' after male gorillas. Aquarium designers used the term 'beach masters' after male elephant seals) have done outstanding work and are justly held in high regard. Others have embraced tradition and delayed progress. When frontline operators feel left out of the design process or plans are imposed from above, uptake can be limited. Male dominated top-down management was the universal style for the first several decades of my practice.

Once, while working with Chinese officials on plans designed to create a premier giant panda park, Our Western consultant team began the first meeting, as we would with Western clients, by asking the Chinese management team through our interpreter what their vision for the project was. This question was followed by a long discussion within the client group in Mandrin. Finally, the interpreter conveyed their response that we were the international experts, and we were to tell them what to do. They clearly saw

their job as implementing but not conceiving. the vision and ultimate design. Later, as we explored the Sichuan area (described in Chapter 8, Figure 98) we greatly admired the traditional Tibetan vernacular architecture we encountered in this area of Western China. Our plans envisioned entering through a Tibetan village, then penetrating the mountain forest beyond to observe the giant pandas. One response from the clients was “We don’t need foreign experts to build local architecture.”

Inclusive leadership based upon team-building interdisciplinary discussion and consensus has become more common in Western-style zoo management. This decision-making process usually takes much longer but results are more balanced and more widely supported. In my experience this type of leadership coincided with the immergence of women in leadership positions. Designers do not get to determine management styles of their clients and must find ways to optimize results for their clients and collaborations.

Remote leadership in which the designer has limited access to decisionmakers guarded by official gatekeepers should be avoided. This is why I no longer work for government agencies, large corporations, or royalty unless I have direct access to key decision makers or our government work is in remote areas and local government officials are free to innovate. This was my experience as a US Peace Corp volunteer in Brazil and with the UNEP in Afghanistan.

**Designers don’t know the literature.** My old friend, colleague, and client Dr. Terry Maple used to say: *“Jon is the only zoo architect who knows the scientific literature.”* Terry, with co-author Dr. Don Lindburg wrote the book “The Empirical Zoo”, making the point that zoo design and management should be based upon science rather than tradition and informal anecdotal observations. In most zoo design projects zoo clients are responsible for preparing project briefs describing both staff and animal needs in detail. However, a particular zoo may only develop a single new primate facility for example, while a zoo design specialist may have designed many, having worked with noted primatologists and thus having more diverse and up to date information than a client zoo. I chose early on to give empirically supported conference presentations resulting in further familiarity with published research on zoo biology, informal education, and visitor studies. Recently I asked my network of zoo designer friends around the world how much they relied on scientific findings, either evaluations published in conference proceedings or peer-reviewed journals and books. All answered they seldom relied on such sources. Why not?

- Zoo clients do not request or encourage research evaluations, saying these are expensive, may take months or even seasons to complete. Clients are keen to move on to their next project.
- I have found published research is compartmentalized into subjects such as animal welfare, visitor studies, education, conservation, and human resources. Integration of research across these specialist boundaries is rare, yet such integration is key to the designer’s success.

- The growth of published frameworks for assessing animal welfare in existing facilities represents a useful trend in identifying problems but offers little insight into creative design solutions.
- Scientific papers exploring perceived problems in animal welfare or other fields are more available. Why are there no papers independently evaluating design award winning zoo exhibits and facilities, suggesting successful strategies to follow?
- For zoo designers, specific terms such as “landscape immersion”, “realistic simulation”, “naturalistic”, “functionally naturalistic”, “modernist”, and such have specific meanings. A leading reptile manager listed five terms ranging from “nature” to “totally artificial”. Yet, I have found researchers using terms interchangeably or imprecisely making their findings less creditable. A standardized glossary compiled across these fields would be useful, but I have not found support for compiling this.
- Lack of prototype testing & reviews. Zoo staff are increasingly designing environmental enrichment devices for entertaining bored animals. Infrequently these are being developed using formative (early) testing using inexpensive prototypes to assess animal responses early and often before investing in construction of durable permanent devices. This is a promising direction, commonly used in museum exhibit design, but rarely involves zoos and even less zoo architects. I have only convinced one client, the California Science Center, a museum, to sponsor such a test.
- **What’s the message?** This question affects a wide range of themed zoo and aquarium activities. I believe it is also important in more mainstream design work as well. How does your park or building design communicate your client’s and the public’s interest?
    - Embedded communications. Everything has an embedded meaning, sometimes subliminal and often unintended. The way we dress, groom ourselves and our speech mannerisms all convey communication about ourselves. I once engaged Ms. Penny Beattie to assist the Nashville Zoo Boosters in their financial planning. Before beginning a public presentation Penny and I were at the head table. I was reviewing my talking points while Penny observed the audience entering the auditorium and finding seats. Penny whispered to me *“See the older woman on the left side of the twelfth row? Note how many people come in and focus on her or greet her. She is the person with real power in this audience…probably old money.”* Penny could *“read people”,* the ways they dressed and comported themselves and were regarded. She read their embedded communications. Good equestrians can *“read horses”* for example, and I can *“read trees”*, identifying distant trees species on the skyline. Really seeing is an important learned skill.
    - Everything we design express messages and good design is intentional about intended communications. I previously discussed landscape immersion design and the extreme realism we employed to ensure the landscape visitors

traversed “looked and felt” just like the characteristic natural habitat of the species being displayed. Our embedded message was *“Wildlife and wild landscape are inseparable.”* You can only understand the animal in the context of the habitat with which it has co-evolved.

- Most zoo exhibits are designed with a mishmash of zoo design clichés such as theme park artificial rock formations defying nature with magical waterfalls emerging from their peaks. I call the most extreme examples cartoon immersion. Visitors are surrounded by cartoon abstractions of nature. The message to most visitors, I expect, is *“This place is a zoo!”*
- When visitors see obviously confined animals pacing restlessly before mealtimes or sleeping the day away they are likely to experience the implied message *“This place is a prison”*. When zoos commonly use terms like *“keepers”, “captive animals”,* and *“animal collections”* in my opinion they undercut their intended message of zoo staff as *“caregivers”*, and animals as *“protected endangered species*” within conservation programs.
- Animal managers, intent on improving the wellbeing of animals in their care, are often keen to add environmental enrichment features. If they work within ordinary zoo exhibits featuring clichéd and mixed messages, adding artificial-looking enrichment features, giant pumpkins, or old cardboard boxes, simply adds a positive message about engaged animals and caregivers or a negative message of excessive clutter. However, when obviously artificial enrichment features like large blue balls, children’s playground equipment or pet store animal toys are added to highly realistic artificial animal habitats they unintentionally undercut the original intentional message, developed with great care and considerable cost, of being transported to a place in wild nature.
- If the enrichment boosters and scientists testing their work simply met with the zoo’s educators and original designers, highly effective and enriching features could be designed and installed using natural materials and mimicking features found in the animal’s natural habit.[2] Too often, rather than supporting the exhibits intended message, caregivers complain that the director won’t let us use enrichment features!
- Research publications focus on the effectiveness of the enrichment feature on the animals without considering ways it’s use affects visitor’s experience. A few studies of public perceptions of artificial enrichment features chose venues where exhibits were not immersive, with one small exception, which was deemed inconclusive.
- Explicit action messaging. While I believe that embedded, even subliminal messaging has educational value connecting to emotional and experiential learning, calls to action whether in terms of visitor behavior or conservation

[2] https://joncoe.net/wp-content/uploads/2021/12/NaturalisticEnrichment2006.pdf

action, must be made explicitly, with implicit support from embedded contextual and immersive features.

**How do we communicate?** It is the consultant's responsibility to communicate, give and receive information, confidence and assistance with all clients and stakeholders, humans, and animals. What languages, including body language are most effective? How do we work through translators? Answers to these questions are as varied as situations, but all effective communication is based upon respect, empathy, and intention.

Figure 127. Getting down with gorillas. When meeting other great apes, I always lower my body below theirs, sometimes turn my back and avoid direct eye contact, thus following their natural version of good manners. This always brings them forward to investigate me politely (left photo: avoiding aggressive eye contact) or with a measured display of dominance (right photo). Note in the right photo I placed my hand on the windowsill and the orangutan at Louisville Zoo placed his hand next to mine. My behaviour is called "modelling", demonstrating with body language the behaviour you wish to see in the other. Left photo: Luis Soto Rendón, right photo: Marcelle Gianelloni.

**Good Design** Good design meets or exceeds the symbiotic, reciprocal needs of all principal stakeholders, plants, animals, carers, conservationists, educators, all types of users, business, and community, balancing functionality and delight, underpinned with timely, integrated science.

**Planning & Design process.** This planning and design process Project Hierarchy Diagram and following description were developed with Andrew Scanlon during our visualization of the BraveEarth alliance he was forming. In the introduction of this memoir, I introduced the diagram of the virtuous cycle around a triangle of learning, doing, teaching (and repeat). Here I use the same concept of a three-step cycle, a spiral through time, but now representing 1) practical action, including internal housekeeping management activities 2) science and technology and 3) communication (publishing, storytelling and other methods). Each step in the planning or design process entails some form of these three integrated stages. Each step may take many cycles including circling back to confirm or enlarge on an earlier step. When that step is completed the cycle spirals to the next stage as the diagram below shows. However, it can also spiral back for further research and revision. Planning is a highly iterative journey. Each step can also be visualized as a reasoned approximation, each step homing in on finding and activating the targeted ideal solution.

The diagram shows moving from initiation on the left to completion on the right for Westerners used to reading from left to right. For languages read from right to left it could be reversed. My first conceptual version of this process was drawn with initiation on the bottom and future completion on the top because I visualize the future as “up.”

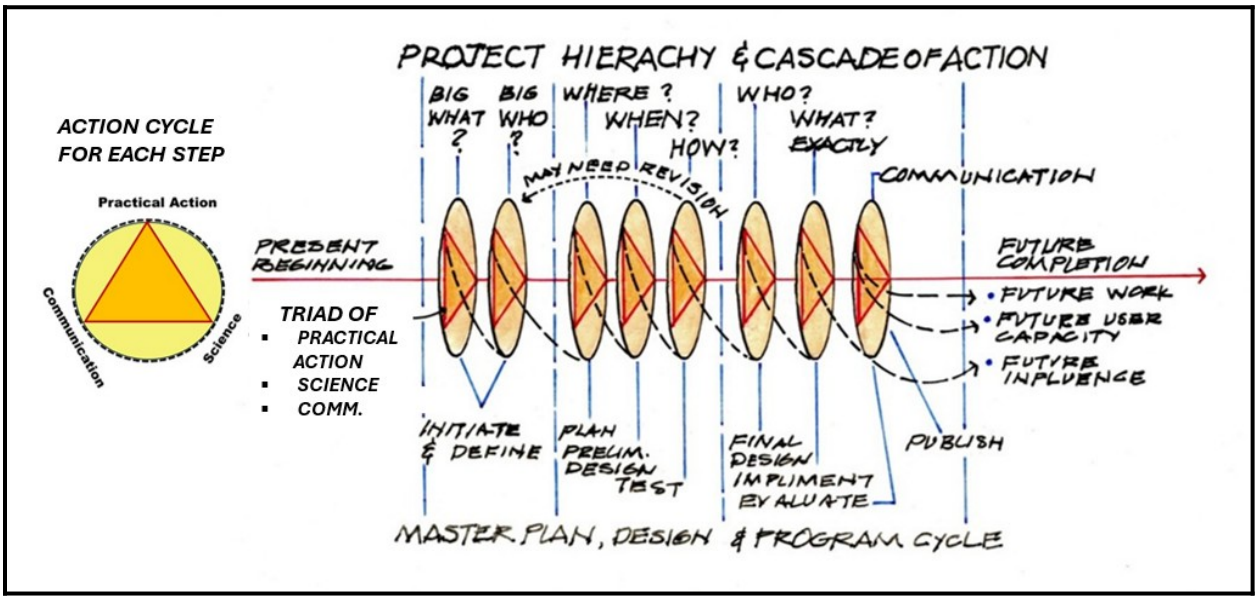


Figure 128. Project Hierarchy and Cascade of Action Design Process Diagram.

First two cycles

1. Initiation & vision
    a. Project evaluation and selection (Is it needed, are we qualified, are we good at it, will we enjoy doing it, can we afford it, will it set a positive new standard (test case - flagship potential?), are their local champions to see it through, what is our chance of being selected?
    b. Mission, Vision, Values, goals, methods
    c. Empathy, having both an emotional and cognitive understanding of the client stakeholders and their needs (the big who).
    d. Define the problem (good problem understanding provides 80% of the solution. The big what).

Second three cycles

2. General discovery (where, when, what)
    a. Initial Inventory (extensive data collection, not too deep yet)
    b. Initial Analysis (identify broad patterns and connections, opportunities and constraints - so what?)
3. Synthesis (creative step, ideation, giving conceptual form - how?)
    a. Preliminary design (develop at least three variations of initial concept)
    b. Formative evaluation (early prototyping and testing and selection of most promising form, direction or strategy)
    c. Documentation

   d. Estimates of time and expense
   e. Client review and approval

Third three cycles

4. Design development to fix and describe intended strategies, programs and objects
   a. Detailed discovery (intensive data and analytical research and for factors affecting initial concepts)
   b. Further prototype and simulation testing
   c. Documentation
   d. Estimates of time and expense
   e. Client reviewal and approval
5. Final design (for constructed features. Will vary for other types of uses)
   a. Design of subunits and overall integration
   b. Documentation
   c. Estimates of time and expense
   d. Client reviewal and approval
6. Contract documents
   a. Contracts, specifications, schedules, tender documents)
   b. Technical drawings
   c. Final estimates of time and expense
   d. Final client reviewal and approval
7. Implementation
   a. Tendering when appropriate
   b. Construction
   c. Operational training
   d. Commissioning and post commissioning modifications
   e. Client reviewal and approval
8. Opening and use
9. Post occupancy evaluation (summative evaluation) and publishing (lessons learned).

**Thoughts about the future of zoos.** Zoo evolution, like other forms, is branching, and not linear. Past forms will persist or evolve as newer forms emerge[3]. Next generations of designers and their attitudes and audiences are an interesting and often frightening subject. Our early habitat immersion designs were based upon our own experiences actively exploring wild nature alone or with quiet, respectful colleagues. I later discovered such exhibits are ineffective when overcrowded with hurrying visitors, such as tour groups taking quick selfies. I visited the wonderfully designed Madagascar Exhibit at the Bronx Zoo on a Tuesday when zoo admission is free. Thousands of noisy

[3] Design and Architecture: Third Generation Conservation, Post-Immersion and Beyond
FUTURE OF ZOOS SYMPOSIUM, 10-11 February 2012
Canisiuand Fernandesalo, New York

urban youngsters with no solitary experience in nature overflowed the building and the exhibits failed to hold their attention.

**Changing audience attitudes.** Some time ago I was contributing to a discussion of zoo and museum exhibit design. I described an example of managed habitat immersion design with a concept for a waterhole exhibit with a succession of different species coming down to the water. A younger designer charged that such an exhibit was too boring. He said his generation was impatient and wanted far more action. This may be true for nearly all zoo visitors, especially on busy days at the zoo or aquarium. Most zoo visitors today are urban with little or no previous connection to wild nature. Much popular social media relies on sped-up experiences, and instant emotional payoffs. How will zoos and aquariums respond? Some facilities are developing digital connectivity between quiet natural animal exhibits linked digitally to videos (or future holograms) of the species in action. The Philadelphia Zoo 360 concept providing multispecies overhead animal trails crisscrossing the park almost assures that some species are active overhead much of the day.

**Culturally appropriation and insensitivity.** Working with CLRdesign in the late 1980's, we designed the Primate Panorama exhibit at Denver Zoo. Our design intention was to show how traditional Africans in tropical environments lived sustainably using local materials as admirable alternatives for our modern high consumption lifestyles. Also, such village architecture would still be seen by American eco-tourists visiting Central African villages. Earlier I told the story of encountering an older woman standing outside the zoo service gate. I saw she was dark skinned wearing an African print and was in some sort of emotional distress. I approached her and asked what the problem was. She said she had recently immigrated from Ethiopia. When she saw this thatch hut in the zoo she was moved to tears. It was just like her home village!

Figure129. Recreations of African village buildings. Left: Denver Zoo Primate Panorama exhibit complex. Right: Louisville Zoo Gorilla forest African village. Both were intended to be respectful representations of sustainable cultures living with wildlife, with zoo visitors “transported to another place and time.”

Recently an American professor[4] charged our design firm and Denver Zoo as being racist/colonialist because we built a simulated African mud-walled thatched-roofed hut for the Denver Zoo Primate Panorama exhibit. He charged we presented Africans as primitives and thus (in his mind) inferior.

At the time we used Irish thatchers for the construction work in Denver. Later at Louisville Zoo we designed an African themed safari lodge café and nearby African rural village using Zulu thatchers. Their wives harvested and dried the reeds and the men travelled to the USA to install the thatch. They did excellent work, singing joyfully together as they thatched! Their work became a popular folklore exhibit.

I designed the African Plains exhibit at Woodland Park Zoo with the principal overlook above the grass-roofed zebra holding building. Much later Mr. Pat Jankowski was hired to design a simulated African village at the overlook. He designed a village school with windows overlooking zebra and giraffe. This was an accurate recreation of an actual African village school. Today this village has been closed as “culturally inappropriate.” How will future zoos and designers deal with such culturally charged environments?

As visitor studies expert Steven Bitgood pointed out, an essential feature of Immersion design is the theatrical and emotional translocation of viewers to “another time and place." They are emotionally transported from the city zoo to the (simulated) African savanna, Sumatran rainforest, or Masoala Reserve in Madagascar for example. But as soon as designers add cultural artifacts or buildings representative of that time and place someone is apt to be offended and charge “cultural insensitivity.” Yet it is the village edge where human-wildlife conflicts occur and where sustainable habitat conservation action is required.

**Summary messages** for a global audience of generalist environmental architects, landscape architects, engineers, planners, and zoo designers, as well as those teaching or seeking such services.

- Follow your passion, enjoy the exaltation of creatively “being in the flow”, taking satisfaction from challenging work well done, whether recognized or not. Awards and recognition are rewarding but fickle.
- Clearly define elevated and ethical goals,
- Dedicate yourself to the service of others. Help clients and coworkers improve their competence and realize their dreams by your example and define your own success accordingly.
- Design together with them rather than for clients.
- The essence of communication is intent. If you truly want to exchange communication you will find a way.

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[4] Why are there African huts at the zoo? The racialized spectacle of conservation
Jessie K. Luna, Department of Sociology, Colorado State University, Fort Collins, CO, USA
2023. Environmental Sociology https://doi.org/10.1080/23251042.2023.2218950

- It is the designer's obligation to communicate with clients in ways they understand.
- Synergy, reciprocity and choice are keys to successful interactions.
- Good design balances empathy (emotional connection), intuition (subjective insight), art (application of creative skill and imagination with emotional power), and science (cognitive inquiry and rigor, testing and knowledge).
- Use design to elevate practice and thought leadership rather than designing down to satisfy transient popular styles or limiting client expectations.
- Exceeding today's standards, envisioning and manifesting tomorrow's "best practice."
- Question authority.
- Define the problem. If traditional solutions are insufficient, turn the problem on its head. Seeing it differently can lead to solving it differently.
- When faced with opposing dualities, find a third path.
- Connect the boxes, build bridges not silos.
- Form a collaborative design team with both policy makers and direct users, including members knowledgeably able to champion the interests of both human and non-human stakeholders.
- Follow an open, iterative "learn by doing" design process utilizing early mockups and prototype testing.
- Carry out and publish post occupancy evaluations integrating benefits (or not) to all stakeholders. Share lessons learned from failures as well as successes.
- Information management: the best thing to do with information is to share it.

This narrative has recalled many of the bridges and passages I have collaborated in finding or building and then crossed between traditionally distinct and distant professions and cultures, enlarging the vision of what landscape architects and environmental planners can do. The tools of my trade have gone from hand drawings, bedsheet posters and plans, and long international flights to computer graphics, GPS, GIS, and global virtual conferences. Soon planning and design will be further accelerated by Artificial Intelligence. Will we use these tools wisely or will these tools use us? Who will guide these processes and outcomes? Personal skills in communication, empathy, insight, trustworthiness and service will never become obsolete. Planners willing to be a little different, combine old wisdom with new knowledge, guided by mutual respect, reciprocity, informed creativity in process and product and having a little courage will be needed more than ever. Who will follow, or better still, invent their own paths, identify opportunities, build bridges, passages and networks, develop action strategies making the world a better place for people, plants and animals? What are you waiting for?

**END.**