

Section IV

Interpretive Exhibits

Interpretive Exhibits

DESERT DISCOVERY CENTER: EXHIBIT CONCEPT NARRATIVE

This document offers an overview of exhibit concepts for the Desert Discovery Center (DDC). It is supplemental to the architectural and exhibit concept renderings that communicate the feel of the linked pavilion interpretive approach visually. The core visitor experience includes an exterior introductory module and six pavilion structures:

- Orientation and Introduction Node (exterior, not a separate pavilion, may be multiple structures)
- Desert Seasons
- Mysterious World
- Staying Alive
- The Hidden Desert
- Human Adaptation
- Children of Tomorrow

Central Theme

The diverse adaptations that allow native plants and animals to survive in the harsh environment of the Sonoran Desert are a continual source of wonder to the careful observer, and a wellspring of ideas and inspiration so that future generations will have adequate resources to meet their needs, as well as the opportunity to experience the magic and mystery of the natural world.

Notes on the Use of Space Not Dedicated to Exhibits

Planners of informal learning facilities are regularly tasked to allocate space for special events, festivals, lectures and temporary exhibitions. Operators of informal learning facilities sometimes struggle to maximize the potential of those spaces, which in some cases tend to lie unused for long periods.

The existing concept plan suggests two significant public spaces (other than retail/dining) without permanent exhibits: the Desert Great Room and an amphitheatre. Maximizing use of these spaces is critical to economically-efficient facility operation. It is also critical to tapping the repeat local market and creating a unique word-of-mouth brand for the DDC.

Case studies of informal learning facilities (and a significant body of empirical evidence) suggest that regularly-changing programming and the delivery of messaging by skilled personal interpreters are among the key attributes that differentiate exceptional facilities. The finest non-personal exhibitry on the planet lacks the magnetic appeal of quality personal interpretation.

The DDC's success is tied to its enthusiastic acceptance by locals. If the product draws the local crowd, the tourist crowd will follow. The best way to keep the local audience coming back, and to maximize the use of space, will be to offer a continually-changing suite of high-quality interpretive programming in both the Desert Great Room and the amphitheatre.

We envision a seasonally-changing menu of interpretive offerings that will also change day-by-day and even hour-by-hour. The essence of this concept is that anytime a visitor comes to the DDC, they will be able to see something they haven't seen before. We should strive to create a vibrant, fair-like atmosphere, an environment in which a visitor can see a program, take a hike and go to lunch, then return to the same space and see something totally different.

The Great Room and the amphitheatre will be magnets for repeat visitation because there will always be something going on, always something happening. There is a robust interest in volunteer support for the Preserve. While appropriate caution needs to be exercised by requiring rigorous training of volunteers and careful monitoring of public contact, it appears reasonable to assume that the human resources to deliver a very ambitious suite of regularly-changing programming are available.

The second pathway to local acceptance (and efficient use of the Desert Great Room and amphitheatre spaces) goes through the school system. If the DDC is appreciated and valued by local schoolchildren and educators, the hearts and minds of local parents will have been won. We envision an assertive outreach to local school systems from the DDC. Facility managers need to meet with local educators and develop an understanding of their challenges. Whatever is needed to get the local kids to the DDC as part of their school experience needs to get done. Those tasks might include developing age-specific programs to meet curriculum requirements, providing transportation, priming the pump by delivering programs at schools, putting up a kids-only website with interactive blogs and other activities, etc.

A third pathway to local acceptance is the presentation of temporary exhibitions. The powerful draw of traveling exhibitions such as Body Worlds is indisputable. The key issue, and one which deserves in-depth discussion and consideration, is whether or not traveling exhibitions (or art shows) that are not consistent with the interpretive themes of the DDC should be presented in the facility. A clear consensus emerged from Phase I work that the permanent exhibits should have a local focus, but whether this criterion should be strictly applied across the board is an open question.

Finally: festivals and special events. The Desert Great Room will be a unique and powerful magnet for events like corporate meetings, weddings and so forth. Rental of the space for such events will likely provide an important revenue stream. But part of the creative vision for the DDC needs to be unique festivals. It seems like every resort town in the West now has a jazz festival, art walk and/or film festival. The process of final design for the DDC should include developing the vision for several festivals that will be unique to the DDC and Scottsdale, something no one else is doing.

One possibility that has been discussed within the design team is the World Series of Interpretation. This event would bring the finest interpreters in the nation together for a week of rotating presentations in the DDC public spaces. A small stipend to cover travel expenses (or subsidies from local hotels for lodging, etc.) would probably be adequate incentive to draw a small army of quality interpreters. They would present their programs (not necessarily using DDC themes) on a rotating basis to facility visitors who would then be asked to rate the programs. At the end of the weeklong festival, the winning interpreters would be recognized at an awards ceremony and receive a cash prize.

Creative use of the Desert Great Room and amphitheatre spaces for continually-changing programming, environmental education, temporary exhibitions and festivals will not only maximize revenue and efficiently utilize space, it will also create incentive for repeat visitation and contribute to the development of a unique DDC brand.

Notes on Visitor Outcomes

The phrase “visitor outcomes” in this document is used to describe interpretive intent. The purpose of an exhibit is stated in terms of what visitors will know, feel and do as a result of their experience. Some planners use the phrases “teaching points” or “interpretive objectives” instead. Whatever phrase is used, it is important to consider all three dimensions: cognitive/intellectual (know), affective/emotional (feel) and behavioral (do).

The outcomes described in this document are the overarching interpretive objectives of the visitor experience, not the entire universe of factual information that will be available to visi-

tors. It is not possible or desirable, at this point in the design process, to list every factoid that will be part of DDC messaging.

Visitors to informal learning facilities rarely remember factual information for even a few days (they remember feelings far longer). This is not to say that the DDC should not provide an engaging learning environment, but reality dictates that we should try to identify a handful of central takeaway messages that every visitor, no matter their level of interest, will understand and retain.

There is a tendency to want to turn the development of visitor outcomes into a listing of facts we want visitors to learn. We do not want to marginalize the importance of the DDC's education function, but should we be measuring success or failure solely by cognitive outcomes, by whether or not visitors remember a certain list of facts when they exit?

Is it a better measure of success if a given visitor is inspired to explore the desert (a behavioral outcome), and has a feeling of wonder at the Preserve's marvelous community of plants and animals (an affective/emotional outcome)?

Notes on Biological Perspective

The DDC will be focused on biota specific to the McDowell Sonoran Preserve, which is dominated by a saguaro-palo verde forest plant community. The generally-accepted division of the Sonoran Desert into six primary biomes will be used for context, with the caution that such divisions almost always have fuzzy boundaries, are open to scientific debate and subject to change as scholars rethink and reclassify. While the Phoenix metropolitan area is considered to lie in the Lower Colorado River Valley Biome, the vegetation in the McDowell Mountains is far more characteristic of the Arizona Upland Biome. The Preserve lies on an ecotone: the biological richness that occurs at the confluence of different ecosystems should be the focus, not the technical consideration of how it should be classified.

There are few distinct boundaries in the natural world, and our approach needs to emphasize interconnectivity rather than division, an holistic perspective that views the planetary ecosystem as a series of connected working parts.

The fact that the DDC lies on an ecotone is of particular importance in interpretation of the area's cultural as well as natural history. The bajadas that form at the base of sky island mountain ranges like the McDowells tend to be home to more diverse flora and fauna than either the rocky slopes above them or the sun-baked valley floors below. Humans have found the bajada environment to be conducive to habitation as well.

One of the defining attributes of the McDowell Mountains is a biological diversity that results from a monsoon season, topographic variability and proximity to other biomes that contribute to both floral and faunal diversity. The hilly terrain offers a wealth of microhabitats on varied slope aspects and in shaded canyons, while ephemeral or permanent water creates even more microhabitats: washes, seeps and springs.

Orientation and Introduction Nodes

This experience will offer orientation to the DDC facility and its amenities, an overview of the great deserts of the world, an introduction to the Sonoran Desert, and a brief history of the McDowell Sonoran Preserve. One of the "pull" exhibit techniques that will be used throughout the facility to engage younger visitors will be introduced here as well.

Some exhibits "push" messages at visitors (watching an audiovisual presentation, for instance). But research on visitor outcomes has consistently shown that actively engaged users learn more and enjoy themselves more. This knowledge is reflected in the contemporary emphasis on interactivity in informal learning as compared to the more passive viewing (i.e. looking at artifact cases and dioramas) characteristic of traditional museum experiences. Effective modern exhibitry asks visitors to reach out and "pull" the message in.

The technique recommended here is a simple, low-tech way to stimulate and maintain interest in the audience segment aged 3-12, but it will be available to adult visitors as well. Interested visitors will be encouraged to carry a special flashlight with them during their visit. Text and graphic content that is visible only when the flashlight is shone on a surface will be located throughout the exhibit pavilions. When visitors shine their light on the correct spot, they will discover supplemental artwork and information that adds a layer of detail to the primary exhibit. The invisible messages are a value-added reward for engaged visitors willing to reach out and “pull” the content.

Two or three levels of message content will be developed to appeal to different age groups from toddlers to adults. It is easy to imagine a scavenger hunt game to engage the younger crowd, while many adults will also enjoy the opportunity to search and discover. This technique will allow an additional level of experience to be affordably created without adding any visual or textual clutter to the pavilions.

The initial concept of using an oversized globe as the physical centerpiece of this exhibit did not receive strong support. It has been discarded. The current thinking is that as many as three different structures will be utilized to deliver the orientation information visitors need, as well as introductory interpretive material (i.e. to answer the question “What is a desert?”) and other messages that place the Sonoran Desert and the McDowell Sonoran Preserve in ecological context. These structures will be an integral part of the landscape experience, offering shade and seating so that they will function not only as exhibit experiences, but also as resting spaces.

Orientation and Introduction Nodes Primary Visitor Outcomes

As a result of this interpretive experience, a majority of visitors will:

- feel welcomed
- be stimulated to learn more about the Sonoran Desert
- know where specific topics, types of experiences and amenities such as restrooms and dining are located in the DDC, and have all the information they need to plan an enjoyable visit
- know that the Sonoran Desert is the most biologically-diverse desert on the planet
- be able to provide a working definition of the word “desert”
- feel appreciation for the City of Scottsdale’s taxpayers, who paid for the acquisition of Preserve lands, and the activists who worked for the passage of the sales tax

DESERT SEASONS

This pavilion will offer a somewhat non-traditional viewpoint of the seasons, utilizing both the scientific perspective of five rather than four seasons and the Native American viewpoint of marking the year's passage with twelve moons. The focus will be on natural rhythms and cycles with an emphasis on climate and plant adaptations.

The Desert Seasons pavilion will feature:

- **Spiral of the Seasons:** a curving, walk-in structure that takes visitors on a tour of a year in the Preserve
- **Many-Colored Desert:** an interactive, raised-relief map of the Sonoran Desert
- **Tom's Thumb Theatre:** an immersive mini-theatre experience focused on geology
- **Cactus/Agave Gallery:** images of the cacti of the Preserve, a saguaro sculpture, a learning station and interactive exhibits
- **Woody Plant Gallery:** images of the woody plants of the Preserve with a learning station and interactive exhibits
- **Herbaceous Plant Gallery:** images of the flowering plants of the Preserve with a learning station and interactive exhibits

Notes on Docent Stations

The importance of personal interpretive services as an integral part of the DDC experience cannot be overestimated. The finest and most well-crafted exhibits typically do not have as powerful an impact on visitors as messages delivered by a talented interpreter.

A docent station is proposed for each of the five primary exhibit galleries. A flexible sort of "non-structure" is envisioned, one that will allow, for instance, a volunteer to deploy a counter to set up a display of objects such as cactus ribs, feathers or minerals, etc., for a learning activity. Each station will be configured in such a way as to allow for changing out graphic elements and making other adjustments that might be needed to allow the docent interpreters to give their creativity full rein.

There are hundreds of volunteers eager to make the DDC a vibrant community center. The docent station concept responds to the tremendous potential for robust personal interpretive services that is created by this wealth of human resources. These stations are also envisioned as places where organizations such as the Center for Native and Urban Wildlife, Phoenix Herpetological Society, Liberty Wildlife and Southwest Wildlife can pitch their conservation messages and enhance the DDC visitor experience by displaying live animals. Should the local Native American tribes wish to become involved in DDC programming, these stations would provide the space needed for them to reach out to the visitor population.

The docent stations are not intended to be changeable exhibit space for non-personal exhibitry, rather they are intended to create venues for personal interaction that will add the color and warmth of the human touch to the DDC interpretive experience.

Identifying techniques that will stimulate repeat visits by local residents is a key objective of this process. The presence of different docents interpreting different themes on different days appears to be a positive way of achieving this objective while generating a high degree of community involvement and commitment.

Spiral of the Seasons

Visitors will encounter a spiral-shaped structure of gracefully curving walls hinting at something special within. Horizontal linear elements following the spiral will suggest the pulse of life as they trace seasonal variations in temperature, rainfall and other natural phenomena. A

walk inside the spiral will take the visitor on a tour of a year in the desert, with imagery of the plants that bloom at a certain time, migratory birds that are arriving or leaving, other animals that may be going through mating rituals or bearing young, what sort of weather is typical and so forth.

Interactive, three-dimensional exhibits spaced at intervals along the spiral will provide opportunities that help visitors understand the adaptations that allow plants to survive the desert's climatic extremes. The spiral tour will include stories about unusual relationships between plants and pollinators, as well as the way desert microclimates shape species composition. Visitors will be able to follow certain plants and animals through an entire year. For instance, a spadefoot will be depicted in its dormant state, burrowed into the ground, at most times of the year, to be shown in its mating ritual during the monsoon. A seed will be followed from germination through an entire annual life cycle.

The spiral of seasons will feature an elaborate image array at its center, with multiple photographs of the Preserve in different seasons and at different times of day. We envision hundreds of images.

The Many-Colored Desert

An interactive, raised-relief map will tell the story of the various biomes that constitute the Sonoran Desert, with particular emphasis on the biota of the Preserve, the Arizona Upland and Lower Colorado subdivisions of the Sonoran Desert and the ecotonal bajada between upland and valley floor on which the DDC will be located.

A large, table-style map will be the centerpiece of this engaging multimedia experience intended to generate relatively lengthy visitor stays.

The map will be a free-standing, walkaround structure with a four-sided screen suspended above it. Visitors will engage the map using interfaces mounted on the map railing. Only one interface will be available for choice-making at a time, but all will display the same visuals. Whichever interface is in use will override the others, e.g. as soon as a visitor begins using one of the interfaces, the other will not accept user instructions, but will continue to show all the visual content. It may be necessary to limit users' time at the decision interface on days with heavy visitor loads.

Map users will be able to choose from a menu of programmed macro-stories, and choose from subthemes within the stories. The interfaces will allow levels of engagement from simply activating a macro-story to self-directed inquiry on a specific, local level.

An example of a programmed macro-story might be "Microclimates of the Desert," with subcategories such as "washes" and "seeps." When a visitor chooses the "wash" option on the touchscreen, several things will happen simultaneously. The laser projector will trace an area on the map in decreasing concentric circles, gradually focusing in on a "dot" location (in this case, on the Preserve). While that is occurring, the suspended screens and inset screens on the user interfaces will show a zoom-in from a satellite image of the landscape to a closeup view of a wash. Once the closeup/detail imagery is appearing on the screens, a brief narration will begin. Audio will be delivered using listening cones suspended above the interfaces and/or listening wands mounted on the map railing.

Macro-stories will include themes along the lines of "Plant Communities of the Sonoran Desert," which would use screen imagery and map-tracing to show the range of various plants and how scientists use them to define ecosystems. Here again, selection of a subcategory, such as a specific plant species, would trigger a zoom-in and brief audiovisual presentation (at the user's discretion).

The map will be of particular value in interpreting birds. For instance, selection of "Birds of the Sonoran Desert" will open up a sub-menu that will allow users to select a specific species of

interest. Once chosen, the laser will trace the bird's breeding/wintering ranges and migration routes on the map while the screens offer an audiovisual presentation that acquaints visitors with the natural history of the bird.

Four languages are recommended for these and other touchscreen interfaces: English, Spanish, German and Japanese.

Tom's Thumb Theatre

Tom's Thumb Theatre will present a mini-immersive experience, delivering the geology theme via a brief audiovisual presentation. It will use animation and narration to help visitors understand the natural processes that shaped the landscape we see today.

The theatre structure will be a scale model of Tom's Thumb, blended into a mural on the wall. Various exhibitry accompanying the structure (such as stratigraphic columns, displays of touchable minerals, schematic representations of geologic forces and aerial photography) will introduce visitors to the basics of geology.

The film will be in the neighborhood of 5-7 minutes long, with the first part dedicated to an explanation of the how the basin-and-range topography of the Southwest was created, and where/how the natural processes that formed the McDowells can be observed in the contemporary landscape. The narrator will be a climber, and the film will open with a climbing scene on Tom's Thumb, using imagery obtained with a helmet camera. The narrator will be one of the climbers, who will begin the narration from the top of the formation. Sweeping views of the surrounding landscape will challenge visitors to understand how the basin-and-range landscape came into existence. The film will then shift to animation (using the same narrator) to demonstrate the geologic forces that shaped the Desert Southwest.

The seats in this mini-theatre will be of the kind that can transmit shaking and vibration, so that screen images can be supplemented with a tactile experience. The culmination of the AV presentation will be a re-creation of the Marcus Landslide event, with viewers at the bottom of a reconstructed range (pre-landslide) that will then come crashing down towards them. As the seats shake and lights dim, an avalanche of rocks will descend towards the audience and "bury" them as the screen fades to black.

Cactus, Woody Plant and Herbaceous Galleries

These galleries will provide visitors a somewhat secluded, relatively more contemplative experience with opportunities for in-depth learning about specific plant species and adaptations.

The structures are envisioned as being semi-circular in shape, placed against a wall or in a corner. The outward-curving walls of the galleries will feature projection screens displaying dramatic, large-format, full-color photos of representative Sonoran Desert plants. The photos will morph from one into another other periodically. Another large, static image will be placed on the gallery wall at the back of the space.

Two elongated ovoid reader rails (or other exhibit structures similar in scale) will be mounted on the concave, inner surfaces of the gallery walls. These will deliver the basic interpretation that helps visitors understand the suite of adaptations that allows desert plants to survive climatic extremes. At least two mechanical or touchable interactive elements will be included in each gallery. Photo arrays on the inner walls will offer a collage of photos that depict plants organized by the five Sonoran seasons: summer monsoon, autumn, winter, spring and foresummer.

A discovery portal will be located in the center of the gallery space. Its opening screen will show the photo collages, and a touch on a given image will take the visitor to another screen (or set of screens) that gives the natural history of that species. This information will be supplemented with artistic interpretations of the plants from a variety of artists, ethnobotanical information (historical and contemporary human uses of the plant) and also any Native

American or other historical legends that might be associated with it.

The information portals will include various identification games, Q-and-A challenges and other elements that will actively engage visitors beyond the simple reading/viewing of information.

Notes on Discovery Portals

Circular, floor-mounted discovery portals will be an integral component of a number of DDC exhibit experiences. The intent of providing similar structures is to increase visitors' comfort levels: they will recognize each structure as a vehicle they can use to delve more deeply into exhibit content and enjoy interactive learning experiences on the cyber-level.

The upper surface will be a circular screen that will allow for use by up to four users at one time. If a single user activates the interface, the imagery will fill the entire surface. Two users would result in a split-screen, while if there are three or four users, each will have access to a dedicated screen defined by an arc across either 120 or 90 degrees of the circle.

The intent is to familiarize visitors with the portals early in their experience, encouraging use even in visitors who might not be comfortable with a touchscreen interface (a population segment that is steadily shrinking). An important component of the design intent is to limit the amount of text content that will need to be delivered via media such as graphic panels.

Desert Seasons Primary Visitor Outcomes

As a result of this interpretive experience, a majority of visitors will:

- feel a sense of wonder at the biodiversity of the Sonoran Desert
- know that the McDowell Sonoran Preserve has distinct seasons, even though the change of seasons may not be as readily-apparent as the change of seasons in temperate climates
- be able to define “monsoon” in the context of the Sonoran Desert
- be motivated to take a hike on the Preserve
- know that the Sonoran Desert has several distinct plant communities, and that the McDowell Mountains lie on a transition zone between the Upland Arizona division and the Lower Colorado River division
- be stimulated to visit other exhibit galleries
- be able to name and describe three specific adaptations of plants endemic to the Preserve
- be able to identify three plants endemic to the Preserve in the field
- be able to define the phrases “basin-and-range” and “sky island”
- be able to describe the geologic processes that created the McDowell Mountains
- feel excited and even a little frightened by the Tom's Thumb Theatre experience.

Mysterious World

This pavilion will be the venue in which visitors take part in an immersive, multimedia experience. They will view the show seated on irregularly-shaped, terraced benches. The primary viewing area will be dominated by a composition of projection screens that float in front of a seamless backdrop. The backdrop has the capability to bend time by delivering effects such as sunrise, sunset, daytime and nighttime. A sculpted landform in front of the backdrop will create a stage-like structure that blends the main show area with the seating area. Projected images and special lighting effects will spill off the screens and onto the audience.

Mysterious World is far more than a documentary presentation about the McDowell Sonoran Preserve. In the space of ten to twelve minutes, guests will be transported into a world of wonder, mystery and excitement. Manipulation of scale, space and time are keys to the experience. Visitors may find themselves the size of ant, facing down a gigantic lizard. They could become a water droplet plummeting from the sky, or become a witness to all of geologic history as billions of years of planetary history are projected around them in a space of less than a minute.

Mysterious World is not just about high-tech, it's about people and their relationship with the desert. The experience will be narrated by three hosts to provide the human touch, the warmth and sensibility that will connect visitors with the story being told.

“Initiation” will be narrated by an elderly woman who migrated to the desert for her health. An artist, she is at first uninspired by her new desert home until she starts to try to capture it on canvas. Then she becomes progressively more enchanted with the light, the colors, the fascinating animals and plants, and she is eager to share her enthusiasm for Sonoran beauty with others.

“Revelation” will be narrated by a charismatic teacher in his 30s. He is the docent/guide/interpreter who reveals the desert at night to his “students.” Building on the aesthetic view of the Sonoran Desert presented in the first piece, this piece gives the intellectual point of view, delivering the message that the desert is a place of wonder and complex interconnection that we can spend a lifetime studying and still never fully understand.

“Invitation” focuses on a family of hikers with a 9-year-old Native American girl as narrator. She goes hiking with her grandfather, who perceives himself as a steward of the land and presents the indigenous point of view as far as people’s relationship with the land. He teaches his granddaughter different ways of looking at the desert, different ways of understanding the dynamics between flora and fauna, inviting the audience to get out on the Preserve and have their own unique experience.

Mysterious World is envisioned as a unique, dynamic experience that will be a key attribute of the DDC brand, and a don’t-miss item on the itinerary of Scottsdale visitors.

Mysterious World Primary Visitor Outcomes

As a result of this visitor experience, a majority of visitors will:

- feel a sense of wonder
- be stimulated to get out on the Preserve and take a hike
- feel differently about the desert and their relationship to it
- tell friends and family that the DDC is a “don’t-miss” experience with a great multimedia presentation

STAYING ALIVE

This pavilion will challenge visitors to look at life in the desert from the perspective of faunal adaptations for survival. It will focus on how Sonoran animals meet the challenges of extreme heat and aridity, and acquaint visitors with the techniques desert animals use to get food, survive predation and reproduce.

The Staying Alive pavilion will feature:

- Desert After Dark: a virtual hunting experience at night using vision, smell and thermal sensing
- Airborne Enemy: a virtual hunting experience during the day using vision
- Twilight Wall: large-scale mural of an evening desert scene with multiple interactive elements
- Dawn Wall: large-scale mural of a morning desert scene with multiple interactive elements
- Couch's Spadefoot Sculpture: adaptations include estivation, body morphology, chemical defense, metabolic adjustment, accelerated reproductive cycle
- Grasshopper Mouse/Darkling Beetle Sculpture: adaptations include chemical defense, territorial defense, immunity to venom(s), hunting/killing techniques similar to large predators
- Tortoise Combat Sculpture: adaptations include body morphology, urine concentration, hibernation, avoidance, metabolic adjustment
- Costa's Hummingbird at Chuparosa Sculpture: adaptations include torpor, morphology, migration, posture, plumage compression; shedding leaves, succulence

Two large, gently-curving walls will separate the Staying Alive pavilion into night and day sides, emphasizing the fact that so many desert animals are nocturnal. Half of the space will be dim, cool and mysterious. The other half will be bright, warm and airy. The dividing walls, and the walls of the pavilion itself, will be a rich visual cornucopia depicting desert fauna in their native habitat, with various interactive experiences to help visitors understand that, despite its beauty, the desert is a place where the struggle for survival does not cease: a constant battle between predator and prey played out on a stage where every life form must meet the ongoing challenges of climatic extremes.

Dawn Wall

The Dawn Wall experience will occur on the night side of the pavilion, suggesting the transition from night to day. The mural will be a sweeping desert scene in the golden light of early morning. We envision a diorama-style depiction, with far more creatures in the scene than would ever occur at the same place/time in reality. At first glance, the mural will appear to be a static, two-dimensional work of art. But the surface will be rich with opportunities for discovery and interaction. The first level of interaction will be available to visitors using the flashlights previously discussed. An entire world of imagery and ideas will be revealed by the simple act of shining a light on the surface. Visitors using the flashlights will be able to see, for instance, an x-ray view of a rattler's hollow fangs, heat radiating from a jackrabbit's ears, toads and insects burrowed in the ground, a lizard absorbing solar heat and so forth.

The second level of interaction will be activated mechanically. A series of doors and sliders will be hidden in the mural, at first glance appearing to be part of the scene. But by opening the portals, visitors will discover another world of information. The focus will be on the life histories of various animals in the scene. One of the doors, for instance, might be concealed in the part of the scene that shows the paw of a mountain lion. When opened, a touchable replication of the paw will be revealed so visitors can appreciate its size and marvel at its deadly claws. As another example, moving a slider concealed over the image of a vulture's legs will reveal a video screen that shows how the blood vessels in its legs dilate to dissipate heat (and even how the animal urinates on its legs to trigger evaporative cooling).

Twilight Wall

The Twilight Wall experience will occur on the opposite (day) side of the Staying Alive pavilion, suggesting the transition from day to night. The mural will be a desert scene at twilight, during the transition time when many creatures emerge from hiding and sheltering from the heat of the day. Visitors will use the same discovery techniques to interact with the mural: searching for hidden imagery using ultraviolet flashlights or manipulating doors and sliders to find various experiences concealed behind the surface.

Two virtual experience chambers will be part of the visitor experience, one on each side:

Airborne Enemy

The dayside hunting experience will ask the visitor to become a raptor such as a Harris' hawk. The user will enter a black-box chamber in which multiple projection screens show a sweeping aerial view of the McDowell Mountains. An audio track will provide the necessary instruction for visitors to learn the use of a handheld interface (similar to a Wii controller). Once acquainted with the use of the interface, visitors will be challenged to fly over the landscape in search of prey on the ground below.

Desert After Dark

The nightside hunting experience will ask the visitor to become, in turn, a snake and a cougar. Two black-box chambers will offer the experience of hunting by heat sensing or by vision and sound.

Visitors taking part in the heat-sensing hunting experience will be seated in a chamber in which multiple projection screens depict a shadowy nighttime scene from the perspective of a pit viper on the ground. They will get audio instruction on how to use a simple controller to move around the scene (with the dim shapes of rock and cacti towering above) or hide and lie in wait for prey to appear. The virtual prey will appear as thermal signatures. The successful hunter will strike at a mouse-sized image using the controller, while the unsuccessful hunter will fail to sense the approach of a king snake and be killed and eaten itself, or sense the approach of the giant thermal signature of a human and be forced to retreat into hiding or strike out in defense.

Visitors who become a cougar will use a controller to move around a larger-scale nighttime scene lit similarly to the view our soldiers see with their night-vision goggles. They will get clues from both their vision and an audio track where deer might be located, mimicking the manner in which the cougar uses both sound, sight and smell to locate its prey (for obvious reasons, the scent cues will need to be translated into auditory cues). Once they detect prey, visitors will be challenged to stalk it. The successful hunter will take a path toward the deer that avoids making any sound; should they take the wrong path, and step on a twig or approach the herd from upwind, the deer will flee and the cougar will go hungry.

Sculpture

The open spaces on either side of the day/night dividing walls will feature dramatic, realistic, large-scale sculptures. Visitors will interact with the sculptures on two different levels: concealed images and messages on the figures will appear to flashlight users, and discovery portals will offer in-depth interpretation and various cyber-based interactive activities. The sculpture that is envisioned is not representational: it will be anatomically-correct, and the only artistic license taken will be that of manipulating scale. Monochromatic sculpture is recommended, to be crafted from metal or even concrete. Innovative use of a recycled material is suggested, to create an additional interpretive modality and remain true to the sustainability/conservation message of the DDC.

Generating emotional response is a critical consideration in this exhibit space. The affective

outcomes that will be generated include fear (by putting visitors in the perspective of prey animals), pity/sadness (several animals will be about to be eaten) and admiration/awe (the efficient killing tools of predators will be vividly portrayed).

A discovery portal associated with each sculpture will offer interpretation of the specific adaptations that are portrayed in the sculpture, with both photographic and/or film imagery depicting Sonoran Desert species that utilize the same/similar adaptation. The portals will also provide quiz situations, identification challenges and other electronic interactive activities to engage users at all levels of interest and ability.

The portals will be able to function as research libraries as well. There is no compelling reason why in-depth natural histories should not be provided: doing so creates no visual clutter, requires no physical space and presents no major technological challenges. Such resources, combined with good pre- and post-visit curriculum guides, will be an important component of the suites of assets that attract school field trips and make the DDC an important contributor to environmental education in the Greater Phoenix area.

Staying Alive Primary Visitor Outcomes

As a result of this interpretive experience, a majority of visitors will:

- be able to describe three adaptations that help animals survive climatic extremes
- know that many desert animals are nocturnal
- be able to describe three adaptations that help prey animals avoid being eaten
- be moved by the drama of survival in the Sonoran Desert
- be able to identify and describe five desert animals with which they were not previously familiar
- feel empathy for prey animals
- be able to describe two different hunting techniques used by desert predators.

THE HIDDEN DESERT

The Hidden Desert pavilion will offer visitors the opportunity to take a long look at worlds they cannot see through ordinary observation, and encourage them to learn new ways of looking at the natural world of Sonora.

The Hidden Desert pavilion will include:

- World Beneath Our Feet: an interactive soil profile
- Wildlife Cams: real-time snapshots of life on the Preserve; on-demand, searchable archival footage
- Snake's-Eye View Theatre: a different perspective on the desert world
- The Secret Sex Lives of Plants: basics of pollination and weird/wonderful relationships
- Ant Habitat: social life and cooperation in the insect world
- Bee Habitat: the world of the cactus bee
- Reptile Habitats: Gila monster et al.

Soil Profile

An entire wall will be made of transparent plexiglass so that a view of the soil behind it is revealed. This wall will actually be below finished grade if engineering issues (drainage, etc.) can be effectively addressed. Visitors will see animals in burrows; activate video that shows microscopic soil life; learn how the caliche layer forms; understand cryptobiotic crust (and why they need to stay on trails to avoid damaging it) and pull out drawers that reveal touchable minerals and other objects that docents can change out to support various programs. Large-scale imagery/sculpture of some of the truly beautiful microbes that inhabit healthy soils (diatoms, rotifers, etc.) will be used to create a unique aesthetic experience.

Pending consideration of engineering challenges and consultation with entomological specialists, a live ant colony and/or underground bee habitat may be integrated into the soil profile.

Wildlife Cam

The wildlife cam concept responds primarily to the fact that many desert animals are nocturnal and secretive. Even people who have lived their entire lives in the Southwest have probably never a cougar, Gila monster or Arizona's state mammal, the ringtail.

This exhibit will be much more than live feeds from cameras at Preserve watering stations, but it begins there. The goal is to create as rich and dramatic a virtual wildlife-viewing experience as possible, even for visitors who may never set foot on a trail. The core concept is to bring the outside in by transmitting on-ground imagery from the Preserve into the DDC.

Cameras equipped for infrared night photography will be placed at watering stations, with additional cameras at various viewpoints throughout the Preserve (i.e. on top of a ridge, offering a view of the Phoenix metropolitan area or looking down the opposite side of the range across the Marcus Landslide, etc.). These will provide live feeds via a wireless network to a set of monitors in the gallery. This bank of screens will be the primary exhibit structure.

Anybody who has ever tried their hand at wildlife photography is painfully aware that it involves many hours of patient, sometimes unproductive waiting for something to happen. It is a certainty that there be little or no wildlife action in the cameras' viewsheds for long periods. So, in addition to the live feeds, a user interface that will allow visitors to view archival imagery on demand will be provided. As time goes by, the DDC should be able to build a library of footage that will be of interest not just to casual visitors, but to the scientific community as well. Once a library of imagery accumulates, it will be searchable so that visitors can look for footage in their area of interest.

Animals on the Preserve are known to use abandoned mines as habitat, particularly bats. Placement of infrared cameras inside the mouth of one of these manmade caves might yield some excellent images of the bats that few people ever get a really good look at (unless one gets trapped inside their house).

The bird life of the Sonoran Desert is particularly diverse and colorful, and birders are a small but important DDC audience. Engaged birders tend to be ardent conservationists who are very knowledgeable about the natural world (many local birders are undoubtedly already strong supporters of the Preserve). To the extent that it can be achieved without disturbing the animals (consultation with wildlife authorities and experts is obviously indicated), nest cams and cameras in other locations likely to yield imagery of birds will be deployed. A log of sightings, to be available via the internet, is suggested. Keeping such a log of bird sightings (both personal and via camera feeds) will require a commitment from volunteers, but here again we are making the assumption of a committed group of volunteers. The log will be made available as a blog so that it functions as a dialogue to which local birders can contribute.

The Secret Sex Lives of Plants

The role of pollinators in the maintenance of healthy plant communities, as well as food production, may be one of the most under-appreciated phenomena in the natural world. This exhibit space will have a two-pronged focus: to increase visitors' appreciation and understanding of the role of pollinators, and to provide an entertaining look at some of the fascinating, unusual relationships between plants and insects.

We envision a single gallery of the same general shape and feel as the three galleries proposed for the Desert Seasons pavilion. It will be a semi-secluded space, separated from the primary exhibit space by two curving wall structures. The surfaces facing the primary exhibit space will be constructed from large projection screens. Micro-photography will dominate, featuring images of various insects at mega-scale, and close-ups of flowers and the reproductive organs of plants. The images will morph from one into another. The interior surfaces of the walls will feature arrays of still photos. Two reader rail structures will be mounted on the interior, convex surfaces of the walls to introduce visitors to the basics of plant reproduction and pollination. Large-scale touchable elements will help visitors grasp the various structures within a flower, and lightbox-style viewers will demonstrate the visual cues that help insects find the plants that sustain them.

A discovery portal located in the center of the interior space will offer an array of engaging games, quizzes and other activities. It will include a library/research function with access to in-depth natural histories of both plants and insects, but its primary function will be to deliver entertaining and interesting video of plants and their pollinators in keeping with the pavilion subtheme of revealing natural phenomena that are difficult or impossible to view in the real world.

The design goal will be to have video available for every plant and insect portrayed in the photo arrays. The images will be reproduced on the opening screen so that visitors will be able to easily find information about species from the arrays that are particularly appealing or interesting to them.

Snake's Eye View Theatre

The Snake's-Eye View Theatre experience is conceived as a black box in the exhibit space that will offer a short (5-7 minute) feature film to small groups. A capacity of 6-8 persons seems appropriate so that an extended family group can be accommodated. One of the functions of this experience will be to address illogical fears of the desert that are common to many persons unfamiliar with the environment. By showing visitors how large a human being is in comparison to some of the animals that typically induce fear, and by offering behavioral orientation, exploration on the Preserve will be encouraged and fear will be replaced with curiosity and even empathy.

The screen in the theatre will be mounted high in the space, tilted downward so that visitors seated in reclining chairs will have a comfortable, predominantly upward viewing angle.

The story will begin with a male parent and a female child in a setting outside the DDC. The parent will be encouraging the kid to take a walk in the desert, but the kid resists, being fearful of snakes. The parent begins a dialogue that starts along the lines of: “Suppose you were a snake? And didn’t have any arms or legs? And had to crawl around on the ground? Can you imagine that?” The kid starts thinking, and a dream-like sequence begins: the scene morphs so that the perspective of the viewer is from ground level, looking upward. The visuals will show hikers passing by: in this perspective they are enormous giants, their boots crunching loudly on the trail as they walk past. The dialogue between parent and child continues, with the parent trying to get the kid to understand that snakes are likely far more scared of humans than humans are scared of snakes. When another hiking group comes by, one of the hikers shouts in fear “It’s a snake! Kill it, quick!” At this point in the experience, the view is of rapid flight over the ground until the snake crawls beneath a rock as the screen fades to black. The camera returns to the scene outside the DDC, and after dad calms the kid, he becomes the narrator of a brief multimedia overview of how snakes evolved, how they are adapted to live in the desert, and how they have been the target of illogical fears for most of human history. This mini-lecture provides a segue to a discussion of trail ethics, wildlife-viewing ethics, etc. The closing scene shows father and daughter happily hiking off into the Preserve.

Reptile Habitats

Tasteful and innovative display of small live animals is envisioned as a key component of the visitor experience in this pavilion, even though Phase I research found little support for the DDC to be a zoo in the strict sense of the term. That said, the Sonoran Desert has a rich and fascinating assortment of insects (bees, in particular) and arthropods. Some of these creepy-crawlies (certain tarantulas, for instance, and scorpions) might even be considered iconic. Some species have specific adaptations to the desert environment that make interpreting them solidly theme-appropriate in the overall context of the DDC. It is appropriate, as well, within the thematic context of the pavilion to show visitors small animals that they probably won’t encounter even on an extended nature hike: a Gila monster, for instance, or various snakes that hunt at night.

There is no such thing as a manufactured exhibit that is as compelling as a live animal. Nothing resonates more with visitors, particularly the younger audience, than living, breathing creatures. We have good reason to believe that the DDC will have a strong base of volunteer support, a factor that partially mitigates the issue of maintenance (as will the choice to not display large mammals or birds). Pending more discussion with experts and stakeholders, we envision that the Hidden Desert pavilion will include tasteful displays of small live animals such as arthropods and herptiles.

The Hidden Desert Primary Visitor Outcomes

As a result of this interpretive experience, a majority of visitors will:

- be motivated to apply new observational skills on the Preserve
- know that healthy soil is a living community of plant and animal species
- be fascinated by images of wildlife on the Preserve, and motivated to take a hike
- be able to describe, in layperson’s terms, the biology of plant reproduction
- appreciate the critical role that pollinators play in maintaining natural plant communities as well as food crops
- be able to describe two plant/pollinator relationships
- know that burrowing is one of the most common adaptations of desert animals, and that most desert animals are active at night
- feel empathy with desert animals such as snakes that are typically feared and disliked by humans
- feel appreciation at the opportunity to see live animals they have never seen.

HUMAN ADAPTATION

The Human Adaptation pavilion will encourage visitors to consider how humans have adapted to the desert: the technologies used by prehistoric and historic cultures, how contemporary human societies have utilized natural resources, and how future societies will need to adapt.

For millennia, humans have adapted to the desert environment by manipulating water, so the centerpiece of the human adaptation pavilion will be a large-scale, interactive exhibit that interprets water allocation. The pavilion will be organized in a generally circular motif that will include the water exhibit and four period environments tied together with the tagline “Changing Times”:

- Water Allocation: a marriage of water, art and interactive learning
- Hohokam Environment: manipulation of water by the first human inhabitants of the Valley of the Sun
- Cowboy Environment: the importation of EuroAmerican land use models into the McDowell Mountains
- Fifties Environment: boomtown, urban sprawl and adapting the desert to meet human needs
- Contemporary/Near-Future Environment: adapting human society to meet the demands of the desert.

Readers should not assume that “Changing Times” will be a traditional museum-style experience with re-created period environments whose primary purpose is the display of artifacts. Nor should the assumption be made that equal weight will be given to each period. Adaptation is the key theme, and both individual and societal adaptations that will enhance the possibility of a sustainable future will receive the greatest emphasis: the contemporary/near-future environment will receive the largest space allocation and greatest emphasis. The other three environments will “set the table” by providing historical context.

Were there to be an exit quiz as visitors left this pavilion, the critical question would be: “What adaptations must human society make to create a sustainable future in the desert?” This might also be stated: “What three (or five, or ten) things can you do to help create a sustainable human society in a desert environment?”

Water Allocation

This exhibit concept is not a fountain, and it should not be perceived as a decorative water feature. It is an interactive exhibit intended to help visitors understand water allocation. It is purposeful in an educational sense, and that will be its primary function. The fact that it will also function as a work of art should not be taken to mean that its primary purpose is decorative.

The water allocation exhibit is envisioned as being at once substantial and ephemeral, a complex cylindrical structure of vertically-oriented reflective elements down which water trickles from a light well into a massive crucible.

Water will flow down strands of reflective (i.e. stainless steel) or translucent (i.e. acrylic) material in the manner of a rain chain. The volume will be representative of the surface water available to Southern Arizona (essentially the flow of the Colorado, Salt and Gila rivers). Symbols within the crucible or floating on the surface of the water will represent various users of the water: the cities and towns of Arizona, farmers in California and Mexico, industrial/domestic users in Southern California and so forth.

Visitors will be able to manipulate the water flow with interfaces mounted on the crucible to show how the delivery of available water has changed over time through engineering works. For instance, moving a lever might represent the diversion of water from the Colorado River to Southern California. This will change the flow by altering the angle of one of the strands so

that a certain amount of water is diverted from its natural destination in the Sea of Cortez to Los Angeles. LED lighting within the structure, or track lighting mounted outside it, may be used to illuminate the points in the sculpture at which the changes are taking place.

Eventually, if all the storage projects, diversions and other engineering works are brought into play, the flow of water into the Sea of Cortez will cease, making the powerful point that human society has already overdrawn the account of available water. Visitors might use a pump mechanism to represent the pumping of ground water to supplement surface flows, and/or manipulate other mechanisms to represent the recycling of waste water as is done in Scottsdale.

Changing Times

Visitors will travel through four different environments in this experience, tracking human adaptation to the desert through the lens of the living spaces various cultural manifestations have created. The trip through the human occupation of the Valley of the Sun will visit:

- Hohokam farmers in a pit house
- cowboys in a line shack
- Baby Boom family in a suburban bungalow
- contemporary Arizonans in a dwelling that is half-McMansion, half LEED structure.

We want to re-emphasize that the purpose of creating these environments is not to provide a museum-type experience. While the re-creations will be technically accurate down to the finest detail, the purpose is not the display of artifacts. Rather, an encompassing period feel that uses everything from music and temperature control to lighting and smell will provide the backdrop for the interpretation of human adaptation and the way resource use, especially the manipulation of water, has evolved over time. The environments are not the point, lifestyle choices are the point. The three historical environments will be significantly smaller than the contemporary/near-future environment, serving as contextual lead-ins that explore the situation societal lifestyle choices have created.

The entry space for Changing Times is envisioned as a mood piece with a bright, airy feel. Visitors will walk through a simple “maze” created by hanging, translucent curtains. The mood will be mystical and meditative with Native American flute music, chants or similar audio. The imagery on the curtains will be symbols of Southwestern indigenous cultures.

As visitors transition from the entry space into the Hohokam space, the temperature will drop, the light will grow dim and the sound will be muted. Descent may be implied or actual (depending on architectural and technical considerations). The transition will be from the ephemeral to the solid, outside/aboveground to inside/below, implying the change from nomadic to sedentary, hunting to agriculture. The Hohokam space will be used to deliver interpretation of the archaeology of the McDowells with the result that this will probably be the most museum-like experience in the gallery (i.e. artifact displays). The primary user interface will be a discovery portal of the same design and style as elsewhere in the DDC. Graphic imagery will portray the manipulation of water through the building of canals, weirs and diversion structures. The key interpretive message will be that irrigated agriculture was an adaptation to the desert environment that profoundly altered the course of human history since the need to cooperate in labor-intensive activities dictated less mobility, larger villages and increasingly complex social structures.

The next transition will include a rise in temperature and an increase in ambient light as visitors enter a space defined by a re-created above-ground dwelling from the EuroAmerican settlement period. An information portal will again be used as the primary message delivery system, supplemented by graphic panels featuring historic photos. Research completed in Phase I indicated little support for extensive interpretation of the valley’s ranching and mining history (a focus on the natural resources of Preserve was preferred, and that has guided exhibit

development). But the contrast between the lifestyle of indigenous peoples and the new arrivals was profound, and it makes a key point about human adaptation: different utilization of resources and different modes of food production result in the evolution of different social structures. The cattle culture that was imported to Arizona required many acres to support a single animal. Large ranches and widely-scattered family units were the resulting adaptation, a rural lifestyle that differed profoundly from the village-centered lifeways of the Hohokam that preceded it, and the urban sprawl that followed.

The next transition will take visitors from early ranching/mining to the Baby Boom years. The environment will be constructed against a backdrop of a postwar bungalow, basically a Leave It to Beaver scene. Interpretation will be delivered using media that are an integral part of the scene: visitors, for instance, will get messaging from newspapers and magazines (actually fabricated from durable material) that appear to have been casually left open on a coffeetable. A livingroom seating area capable of seating 3-6 people will face an early television set that will offer a video delivered in grainy black-and-white imagery. The theme of this short video will be the manner in which the growth of Arizona's great cities was not so much an adaptation to the desert environment as it was a dynamic of using technology and engineering to adapt the desert to meet human needs. Topics covered will include the building of Hoover Dam, and how the reliable water supply and cheap power it created fueled agricultural and urban development in Arizona. A key theme will be the parallels between the manner in which Hohokam and post-war societies both manipulated water resources for their benefit.

The final transition will bring the visitor to a contemporary/near future scene. This exhibit space is envisioned as being of a size on the order of twice as large as the other environments. The backdrop for the interpretive experience will be a contemporary home that is bifurcated to show traditional building techniques and materials on one side, alternative building techniques and materials on the other. The same media technique used in the Baby Boom scene will be used here: media that are an integral part of the scene such as a computer monitor, big-screen TV and miscellaneous print items will deliver interpretation of a society in flux, looking toward its future. The basic theme will be the ongoing, fundamental shift in our philosophy of resource use: from using engineering to manipulate the desert environment to meet human needs to a focus on adaptation of society's resource use to the reality of the desert environment.

Without being preachy or alarmist, a primary message will be that society's current pace of resource use and waste generation cannot continue. This will be the space where alternative futures are explored, new energy technologies examined, sustainable building techniques evaluated and a dialogue about the direction of human adaptation to the desert environment will be ongoing. An important aspect of this space will be to provide visitors with a guide they can use to discover and understand the sustainable building technologies used in the structures of the DDC.

The key questions: How Will You Adapt? What Five Things Can You Do To Help Our Society Survive Into the Next Century? What Will Scottsdale Look Like in 2100?

The contemporary/near-future exhibit space will use the medium of an unfinished residential structure to challenge visitors to understand how traditional building techniques and a consumer economy have depleted resources in an unsustainable manner and placed our society at a critical nexus in its evolution. Visitors will play the "Adaptation Game." They will be given "resource budgets" and "impact budgets." Game players will be challenged to figure out the ways they can stretch their budgets and reduce their impacts through lifestyle choices. Knowledge areas that will be explored include water conservation (i.e. using grey water for plant irrigation), energy conservation (i.e. building underground, use of landscape plants/structures to cool homes, use of alternative energy sources such as solar and wind, use of swamp coolers and fans instead of air-conditioning), materials conservation (i.e. recycled/recyclable steel structural elements instead of wood, insulating with organic waste such as straw instead of fiberglass). The Adaptation Game will also include choice-making in which visitors learn the

benefits of alternative transportation choices (i.e. how much energy can be saved using public mass transit, cycling/walking and/or electric or natural-gas powered vehicles). Other aspects of the Adaptation Game will track the lifecycle of a consumer product such as a computer from extracting the raw materials used to make it to disposing of it so that visitors will understand the impacts of the choices they make as consumers (and how they can mitigate them). Another aspect of the game will explore food production: visitors will be challenged to feed their family without exceeding an “impact budget” by making choices such as buying locally-grown foods and foods grown without pesticides.

Changeability and, well, adaptability are vital in this space so that knowledge of new technologies can be disseminated as it is developed.

Visitors will exit the space through a curtain maze similar to the one through which they entered, but the ghostly translucent imagery will be visions of a future society in the manner of Robert McCall’s cities floating over the Arizona desert.

Human Adaptation Primary Visitor Outcomes

As a result of this interpretive experience, a majority of visitors will:

- be stimulated to compare how prehistoric and historic societies adapted to the desert environment and how contemporary societies have adapted
- be stimulated to think about the sorts of adaptations human society needs to make to create a viable future, and what sorts of technology will help society achieve sustainability
- know that urban development and agriculture in Arizona are largely dependent on water supplies that are finite and over-allocated
- know that the City of Scottsdale recycles its wastewater to reduce its dependence on imported water
- be able to describe who uses the available surface water in the Desert Southwest
- appreciate the future-friendly building technologies used in the construction of the DDC
- be motivated to make sustainable lifestyle choices
- be encouraged to envision the future.

CHILDREN OF TOMORROW

This children's gallery will be focused on the age group ten and under. This is a somewhat arbitrary choice, and there are huge differences in learning styles and abilities within the age group. The assumption is being made that most of the content in the other galleries will be understandable and accessible to kids of middle-school age and up. An exterior free-learning space for toddlers and early elementary schoolkids is suggested, with moveable shade structures, walls, etc., so that it can be adapted for use throughout the year. Accommodating classroom-sized groups of twenty or more kids needs to be a consideration as well. To a large extent, DDC programming and activities aimed at kids will be conducted outside, with a strong emphasis on getting out on the Preserve trails, experiencing nature firsthand and getting some exercise in the bargain. This space will provide fun learning experiences that stimulate the desire to get outside.

This gallery will include:

- Walk-in Saguaro Cactus: enter an icon
- Interactive Floor: a view of the world beneath our feet
- Time Machine: encouraging thinking about the past and shaping the future
- Free Learning Space: beyond playground
- Terrarium Listening Station: different ways of observing the desert world
- Small Animal Habitats: engaging in conservation

Walk-in Saguaro Cactus Sculpture/Interactive Floor

This cactus sculpture will be a highly-interactive, fun learning experience. Kids will enter the cactus to see its rib structure, look at a bird's nest from the inside, activate a demonstration that shows how the ribs swell as they absorb water after a rain, and have the opportunity to do lots of activities related to plant adaptation through additional interactive exhibits within the structure.

Another, true-scale cactus model will be installed outside the structure, with the root system appearing in the floor using the medium of LED lights. Kids will be challenged to find some of the many animals that burrow within the root structure of the plant. Interfaces on the cactus will allow the activation of many sorts of other games in which the kids learn about the plant's physiology and the animals that rely on the saguaro for habitat or food. These, and all exhibit activities in the gallery, will actively encourage exploration of the Preserve.

Time Machine

The Time Machine will be a curiosity-provoking structure that suggests exploration of the strange and fantastic. Kids will explore past and future using both mechanical and electronic interfaces on the structure. A wide variety of challenging, engaging learning games are envisioned. Kids will make choices about, for instance, the sorts of materials they might choose to build a home, then get transported to the future to see the consequences of their choices. They will be tasked with deciding about larger issues such as land use, and the machine will take them back in time to learn about the consequences of choices made by previous cultures, then return to the present, make their own choices and travel into the future again to see the consequences.

This structure is envisioned as having interfaces on the outside as well as being a walk-in experience such that 2-3 kids can enter and sit as if in a spaceship. The experience might have significantly more impact as a "spaceship" since the environment within could be enhanced with vibration, interactive lighting and so forth.

The Time Machine will also provide an extensive suite of scavenger-hunt style games, Q-and-A games related to plant/animal adaptations, etc., to encourage kids to explore the other DDC galleries.

Free-Learning Space

A safe, well-conceived area in which younger kids can blow off some steam will resonate strongly with parents managing toddlers who need a place to run around and have some unstructured fun. Done well, this area could conceivably become a place for local moms and dads (who have DDC annual passes or memberships) to gather and socialize while their kids expend their energy.

One of the original ideas proposed for this space was to re-create the McDowell Mountains as a scale model using recycled tires or similar material. A concern has emerged that offering such a structure as a play space would send the wrong message. Staying on trails is one of the most important stewardship messages that Preserve managers hope to communicate. The concern is that having kids climb on a mountain model might inadvertently make them think that going anywhere off the trail in the desert would be OK, creating an unsafe situation and causing environmental damage. Other reviewers have suggested that this point of view represents an over-reaction, and have asserted that kids know the difference between a model and the reality of the desert.

The free-learning space will offer a variety of activities and structures, perhaps even a water-based environment (which brings in an entire set of logistical and maintenance issues). The space will be landscape-integrated, with nooks built into retaining walls that kids can enter to mimic the burrowing of desert animals. Challenging kids to think about their future in different ways will be a subtle but important point to make in this exterior area. We envision bringing the sort of experience described in the Time Machine outside in a low-tech mode. Kids will be challenged to think of ways they can create different futures (i.e. “Five Things You Need to Know to Survive in the Desert of the 22nd Century”) through such techniques as building structures with oversized foam blocks that represent alternative materials (e.g. straw bales). Young visitors might play with balance beams by placing weighted objects on scale pans that create different cost/benefit scenarios of various methods of power generation, waste management, resource use, water allocation and so forth. The experience will be low-tech and fun.

An overriding consideration for the Free-Learning Space needs to be a focus on indirect learning and enjoyment as opposed to a didactic approach.

Terrarium Listening Station

This exhibit will be a “world under glass” that features a detailed, miniature reconstruction of the habitat of the McDowells. Listening tubes will transmit the sounds of various animals (coyotes, birds, cougars, etc.) to young users. Kids will be challenged to listen, identify the animals and find them in the mini-diorama.

Small Animal Habitats

The logistical and maintenance issues involved with displaying live animals are well-known, but in the case of this kids’ space we recommend having at least one habitat since the resonance of live animals with kids is so powerful. If a single habitat is found to be desirable, a desert tortoise is suggested because of the obvious potential for teaching and encouraging conservation. But tortoises spend a lot of time hibernating in burrows, so even though kids can be actively engaged in activities such as trying to pick the date a resident tortoise might come out of hibernation, there will be lots of time when no immediate gratification is provided.

Consideration of allocating enough space to provide either insect or herptile habitats within this exhibit space is encouraged, as well as consideration of using the exterior play space to plant a butterfly garden that could actively engage kids in both maintenance and learning activities.

Children of Tomorrow Primary Visitor Outcomes

As a result of this interpretive experience, a majority of visitors will:

- have fun
- be able to name two animals that rely on the saguaro cactus for food/habitat
- be able to describe two adaptations of the saguaro cactus
- be stimulated to think about what the future might look like
- be able to identify two animals by sound alone
- have fun.

Interpretive Exhibits

Mysterious World

A Proposal for an Immersive Experience for the Desert Discovery Center

Scottsdale, Arizona

Prepared for:

Swaback Partners

Prepared by:

BRC Imagination Arts



March 16, 2010

“Study nature, love nature, stay close to nature. It will never fail you.”

Frank Lloyd Wright

“Mysterious World”

An Immersive Experience for the Desert Discovery Center, Scottsdale, Arizona

“Mysterious World” is more than a presentation about the McDowell Sonoran Preserve. This is an immersive experience that transports guests to a world of wonder, mystery, and excitement. In the space of ten to twelve minutes, guests will be initiated into this exotic world, amazed by the revelation of its extraordinary wonders, and invited to join friends and neighbors as fervent protectors and stewards of its magic. Visitors will return with family and friends to experience this astonishing world again and again.

Guests view the experience seated on irregularly shaped terraced benches. These benches face the main show area. The immersive “show” utilizes synchronized projected media, theatrical lighting, background music, sound effects and physical special effects. The main show area is dominated by a dynamic composition of projection screens which float in front of a seamless backdrop. This backdrop is capable of creating effects such as sunrise, daytime, sunset and nighttime with star-field. A sculpted land-form creates a stage-like structure that blends the main show area with the guest seating area. At times during the show, projected media and special lighting effects spill off the screens and onto the audience.

Guests are not passive spectators in this world – they are immersed in its wonders, caught up in its sights and sounds, and enthralled by its mysteries. These guests might suddenly find themselves half an inch tall facing down a ferocious Chiqualla lizard. They might then become a water droplet, plummeting from the sky at 100 miles per hour only to be absorbed into a night-blooming cactus flower, opening to a summer sun. They might then become an eternal eyewitness to history, watching half a billion years of geologic history rise up around them in 20 seconds.

No other nature center or museum has an experience like “Mysterious World.” It’s a signature experience that will generate repeat visitation. In this awesome adventure, the thrills are non-stop and the guest is the star.

Narrative Walk-Through

The Initiation, the Revelation, and the Invitation

Three hosts narrate the experience. Each host sees the McDowell Sonoran Preserve from a distinctive perspective - reveal how a dramatic encounter with this fascinating landscape has turned into a lifelong love affair. These hosts will appear only briefly. They are doorways into the special aspects of the Preserve, and their words enhance the power of the images. This experience is all about the visuals that drive the message, *“Discover this mysterious world for yourself.”*

As the experience begins, the first host initiates the guests into this mysterious world. What better person to reveal this special place than a woman who was herself transformed by its wonders?

“INITIATION” -- THE PAINTER – This 60 year old artist reluctantly came here 20 years ago from back East with her husband, who came here for health reasons. At first, she wasn’t inspired by her new desert home. Then she became enchanted with the sights and sounds of the desert, and her life changed as she captured this desert on canvas. We see her vibrant paintings that metamorphose into the environments that inspire her. We are immersed in the desert light at dawn and sunset – it’s like no other light in the world. The painter describes how her fascination deepened as she experienced the changing seasons of the desert, and we experience these changes as the light, the land, the flora and the fauna transform over the period of a year. “I’ve never had an art teacher that taught me as much as this land. Every time I look, I see something new -- something I *have* to capture about this mysterious world.”

Now we know we’ve journeyed to a special place. It’s time to go deeper into its mysteries and hidden treasures...

“REVELATION” -- THE TEACHER – This charismatic man in his early 30’s uses his passion for desert life to engage the imaginations of his students. We are immersed in the wild world he reveals of the desert at night -- full of fascinating plants, animals and insects. It’s a world of baffling riddles and extraordinary revelations. Best of all, it’s a hidden world that only gives up its secrets to those willing to stop, look and listen. “Everything you think you know about the desert is wrong,” he tells his students. “It looks barren, but it’s teeming with life. It looks rugged, but it’s actually fragile. It looks dry, but it has an incredible system for saving and using water. It seems to be a place you can understand at a glance, but you can spend a lifetime exploring its wonders and never learn everything.”

After the revelation, comes the invitation – experience the wonders for yourself, and become a steward so others can explore and share this wondrous place...

“INVITATION” -- THE FAMILY OF HIKERS – Our host here is a friendly 9-year-old Native-American girl. She’s come to love the desert as she’s hiked these trails with her energetic grandfather, a Native-American tribal elder. The grandfather doesn’t just see himself as an avid hiker – he’s a steward. He wants to make sure that his granddaughter loves this land as he does, so that she will inherit this sense of stewardship. Then someday her children and her children’s children can enjoy this land as well. As they walk the trails, we are immersed in astonishing images of the land – the McDowells, the hiking trails, the flora and fauna, intriguing rock formations, and interesting geologic sites. We see grandfather teaching granddaughter how to “read” the land. The girl says, “The history of the world is right here – ever changing and ever evolving. Out here you can see what happened a million years ago, and imagine what it might be like a million years from now.”

At the end of the experience, everyone comes together with an invitation. “No description of this mysterious world can ever do it justice. Take the dare. Go out there. Learn. Explore. Experience the mystery and the magic for yourself. This is OUR place. The land belongs to us, and we belong to the land.”

FEATURES OF THIS APPROACH

- This is a one-of-a-kind signature presentation in a unique theater built just to present this particular show in the most dramatic way possible. The result is an exceptional experience that can't be enjoyed anywhere else but here.
- The presentation is specifically designed to produce the emotional engagement necessary to achieve the results of the DDC Mission Statement, as exemplified by the words “compelling,” “inspire,” “understand,” and “appreciate.”
- This presentation will be designed to exceed the high standards of the people of Scottsdale. We understand this place is near Taliesin West, the summer home of one of the world's greatest architectural visionaries. This will be a sophisticated experience in creation and execution, designed to encourage repeat visitations from guests who have seen the best shows of this type the world over.

Preliminary Immersive Experience Facility Considerations

FACILITY CONSIDERATIONS

Story/Flow Considerations

The overall ticketed attraction should be organized around a central “hub” which presents the guests with clear choices for how to organize their visit. There should be design consideration given to a “preferred” visitor route, but it should not be fixed and linear. The immersive experience should be considered the first stop on the preferred route in order to accommodate first-time visitors and to build anticipation for the rest of their experience.

Site Considerations

After the initial load-in, consideration should be given to occasional back-of-house access to the immersive experience. Ideally, technical equipment and scenic elements should be able to be accessed without having to cross into public spaces. Whether the immersive experience is housed in a dedicated building, or is part of a larger shared building, sound and vibration mitigation should be important factors in its relationship to the other attraction elements. A post-immersive experience area could include a picture window with a “framed” view of the McDowell Mountains to the North.

Facility Considerations

The facility should be approximately 3000-5000 sq. ft. The ceiling should be free-span ranging in height from 20 to 24 feet clear (to the underside of beams or trusses). The footprint should tend more toward a square shape rather than a narrow rectangle. There should be dedicated “facility” power (house lighting, emergency power, HVAC, etc...) and dedicated “show” power (show controls, low voltage, servers, etc...). The main show space for the immersive experience should have total light control.

The immersive experience should be pulsed. At this time we think of this as a seated experience, but we are early in the design process. We might include options for guests who wish to stand. There should be separate entrance and exit doors and pathways. Consideration should be given to queuing and batching audiences before each performance on design and peak days.