



An exhibition at the National Zoo



1 Entrance to Asia Trail





2 Sloth Bear Exhibit and Curiosity Station





3 Sloth Bear Feeding Zone





4

Sloth Bear Viewing and Animal ID Sign





5 Sloth Bear Conservation Plaza





6 Conservation Geography Exhibit



7

Clouded Leopard Viewing Platform





8 Fishing Cat Exhibit





9 Camera Trap and Look Stations





10

Wild Sign



11

## Plant ID Sign







12 Red Panda Overlook



13

# Bamboo Growth Interactive







14 Giant Panda Log Book and Viewing Scope





15 Giant Panda Conservation Plaza





16

## Decision Stations





17 Giant Panda Grotto and Cold Rock





18 Japanese Giant Salamander Exhibit





19

## Giant Panda House Microscopes





20

## Giant Panda House Chip Scanner





project name: \_\_\_\_\_

**Asia Trail**

exhibit name: \_\_\_\_\_

**Keyed Plan and Circulation routes**

- Upper trail Sloth bear entrance
- Upper trail Sloth bear exit
- - - Lower trail
- ① Keyed Exhibit

date: \_\_\_\_\_ page no. \_\_\_\_\_

**1.04.06**

scale: \_\_\_\_\_

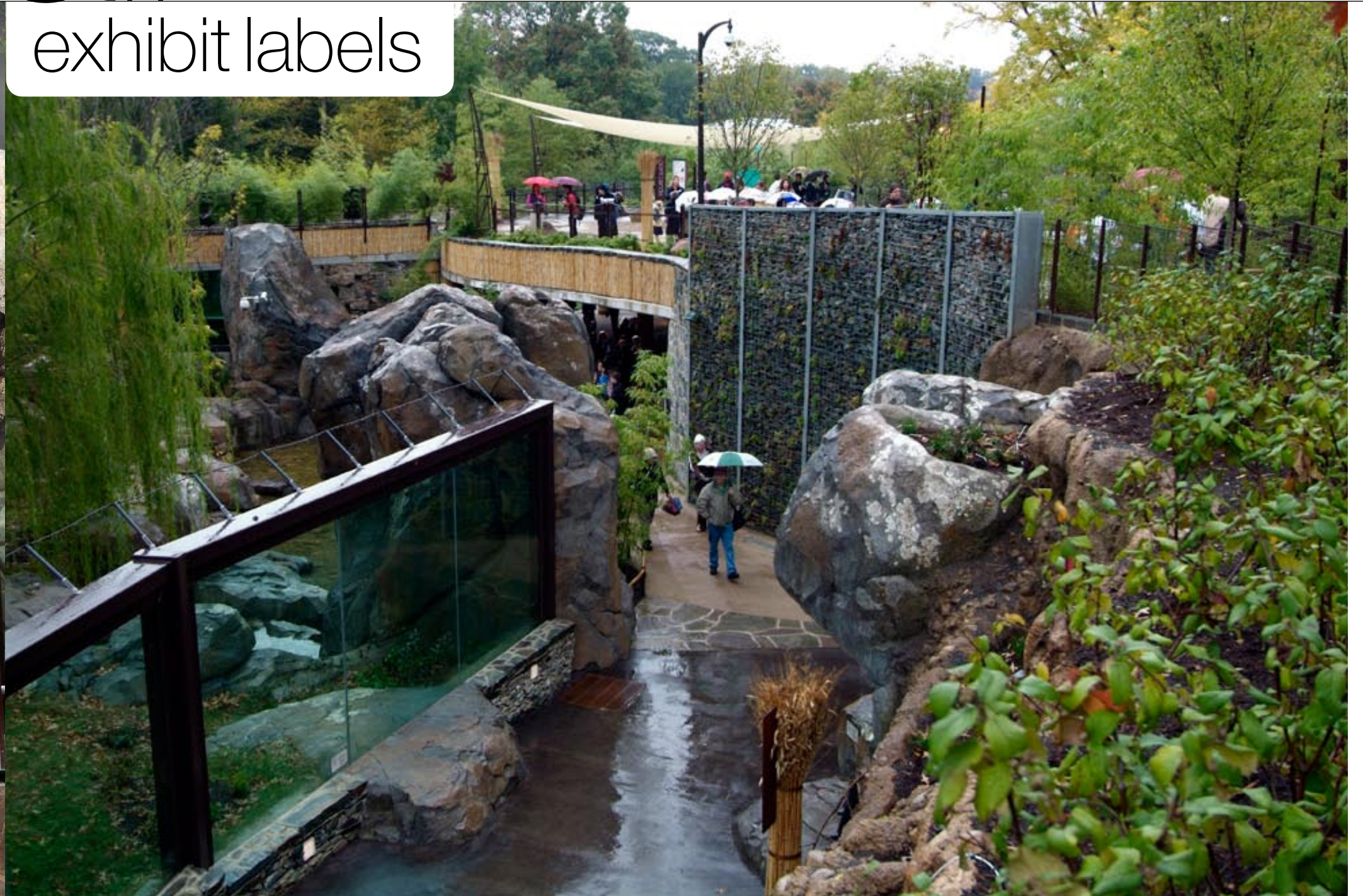
**1:1500**

**1**



# asia trail

exhibit labels



january 4, 2007





abundant

### A CASE OF MISTAKEN IDENTITY

#### Sloth bears are not sloths!

Early biologists mistakenly thought sloth bears were very large sloths. Both have shaggy fur and long, curved claws, but sloth bears are not related to slow-moving sloths.



vulnerable

### WHERE THEY LIVE



grasslands



dry forests



moist forests



endangered

extinct



*Melursus ursinus*

# Sloth bear



project name: \_\_\_\_\_

**Asia Trail**

exhibit name: \_\_\_\_\_

**Animal ID**

**HPL Graphic with stainless steel powder-coated framing and cut out stainless steel letters**

**4' x 2'-10"**

date: \_\_\_\_\_ page no. \_\_\_\_\_

**01.04.07**

**2**



# chinese peony

*Paeonia Lactiflora*

## [ LONG LIVE THE PEONY! ]

The peony is often considered the **national flower** of China, where it is still used in traditional medicine. Peonies, known for their brilliant colors and strong fragrance, can live for more than 100 years.

## [ WHERE ARE THEY FROM? ]

First grown in China and later in Japan, the peony began to gain popularity in Europe in the 18th century.



[ umbrella  
magnolia ]

project name: \_\_\_\_\_

**Asia Trail**

exhibit name: \_\_\_\_\_

**Plant ID System**

**HPL Graphic**

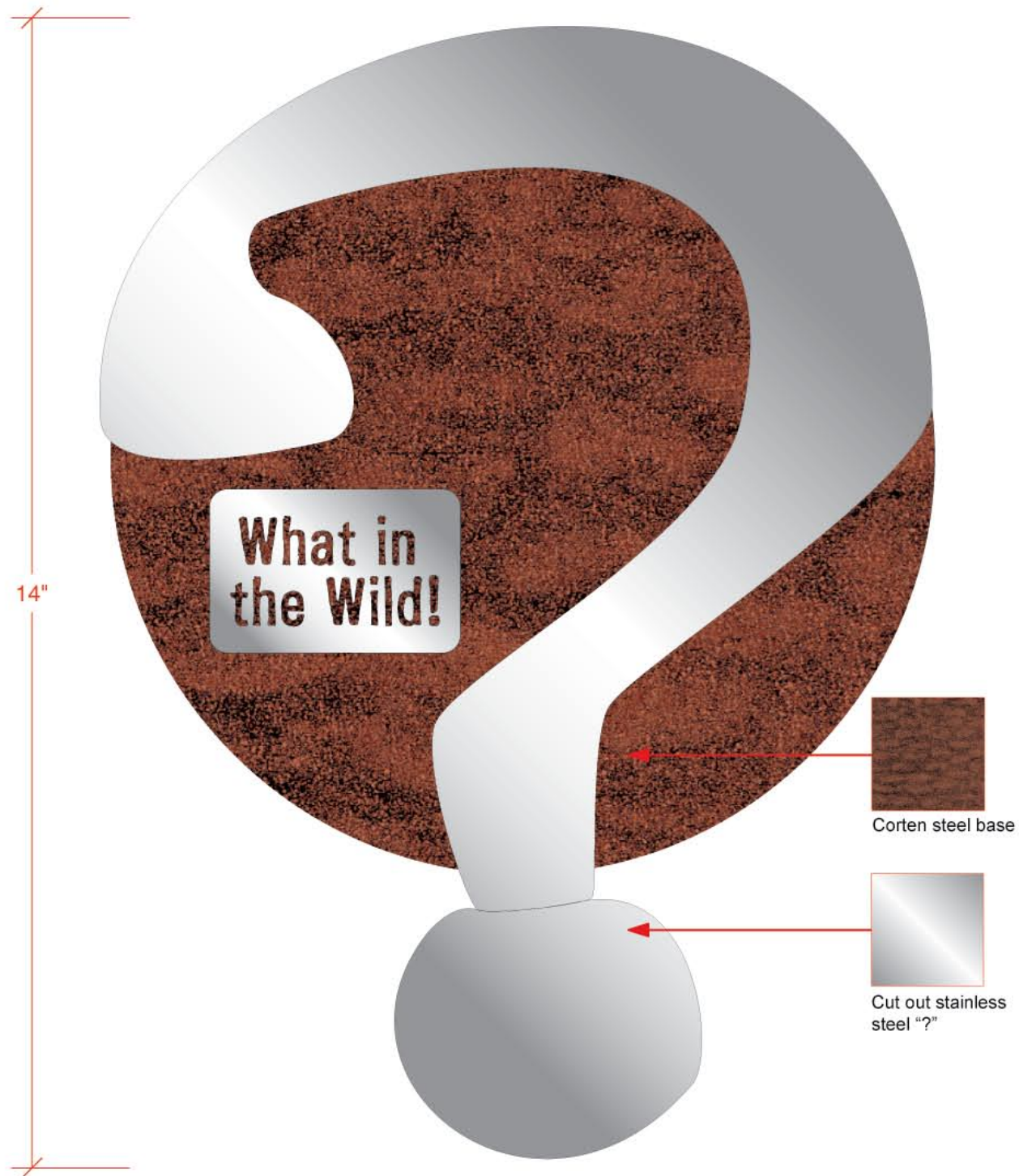
**6" x 12"**  
**1'-6" x 3"**

date:  
**01.04.07**

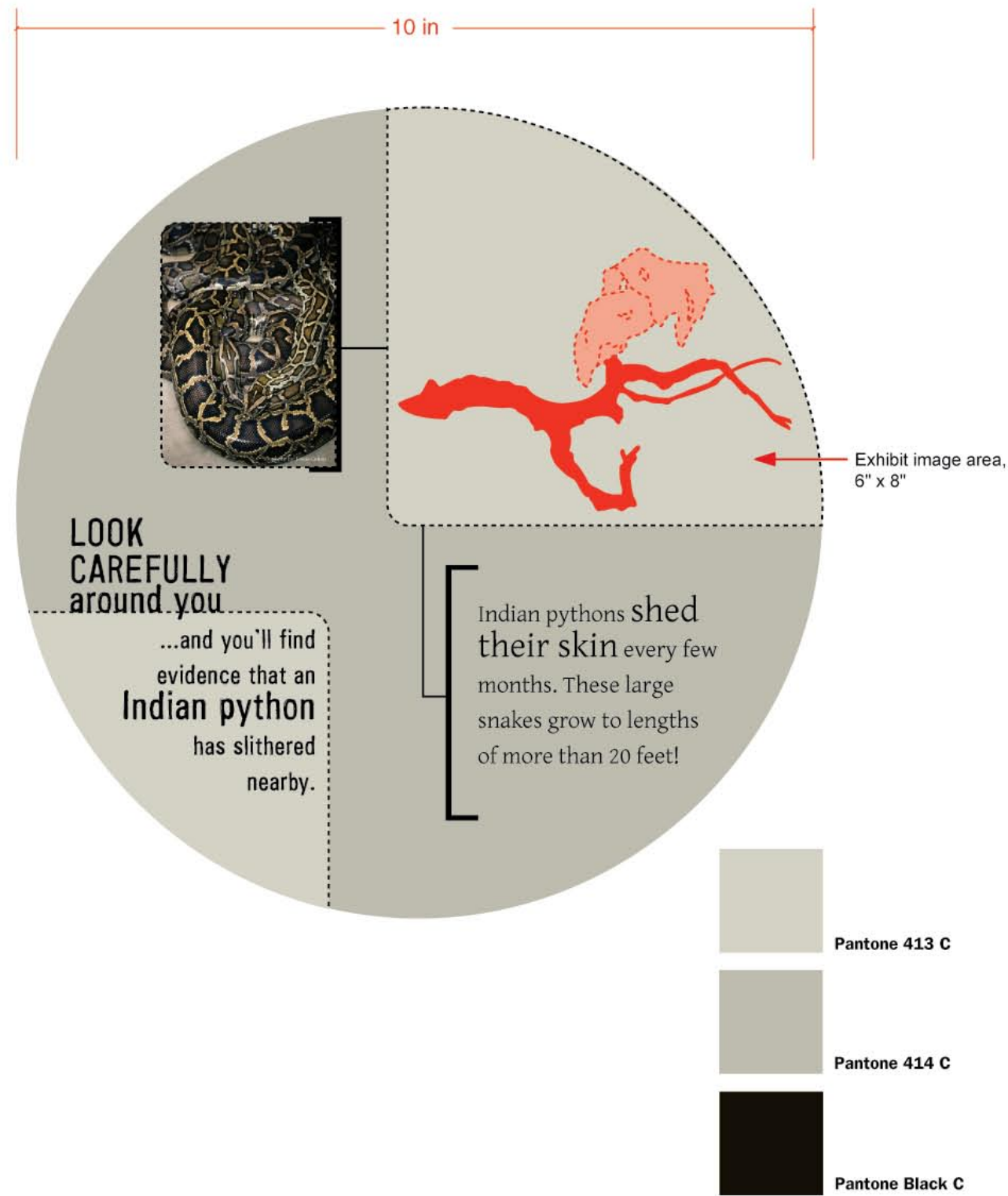
page no.

**3**





What in the Wild!? front cover graphic, 14" x 11"  
Scale: 1/2" = 1"



What in the Wild!? inside graphic, 11" x 11"  
Scale: 1/2" = 1"



project name: \_\_\_\_\_

**Asia Trail**

exhibit name: \_\_\_\_\_

**What in the Wild  
Interactive**

**HPL Graphic with steel  
powder-coated lift lid  
and stainless steel cut  
out letters and question  
mark**

**14" x 10"**

date: \_\_\_\_\_ page no. \_\_\_\_\_

**01.04.07**

**4**



project name: \_\_\_\_\_

**Asia Trail**

exhibit name: \_\_\_\_\_

**Check it Out Graphic System**

**HPL Graphic**

**6" x 10"**

The graphic is a rectangular panel with a yellow border and a light gray background. On the left, a red handprint is enclosed in a dashed circle with the text 'Check It Out' written in a curved font above it. A bracket connects this graphic to the text on the right.

**WARM BRANCH**  
Clouded leopards hang out in the toasty treetops.  
That level tree branch ahead of you keeps the clouded leopards warm on cold days. The branch is actually heated – making it the perfect perch for the leopards to warm up and chill out.

date: \_\_\_\_\_ page no. \_\_\_\_\_

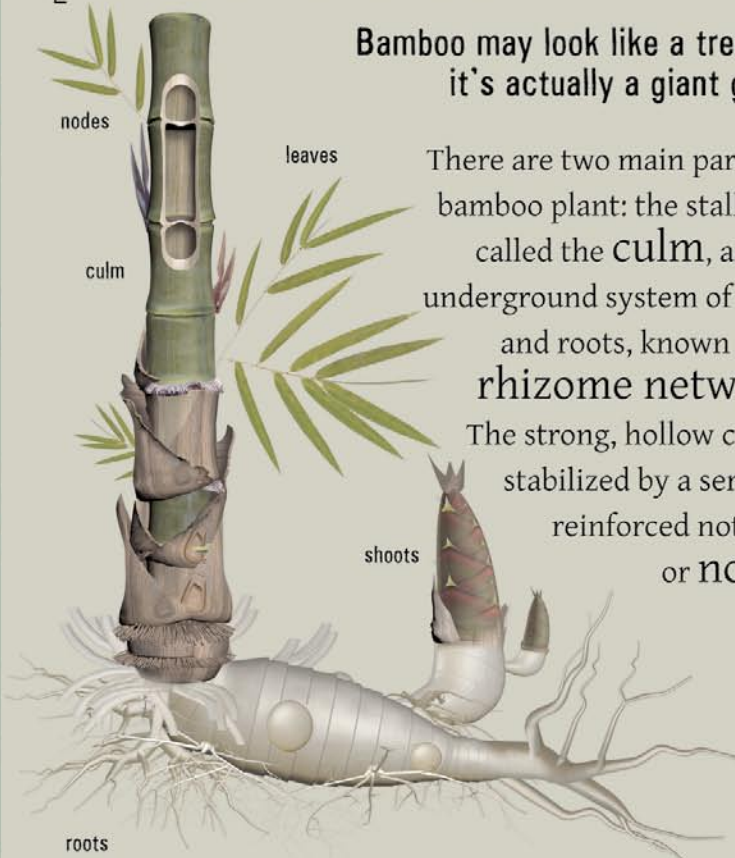
**01.04.07**

**5**



# BAMBOO BIOLOGY

Bamboo may look like a tree, but it's actually a giant grass!



There are two main parts of a bamboo plant: the stalk, also called the **culm**, and an underground system of stems and roots, known as the **rhizome network**.

The strong, hollow culm is stabilized by a series of reinforced notches, or **nodes**.

### Stronger Than Earthquakes

Bamboo's dense network of underground stems and roots acts as a buffer against earthquakes. In Japan, a bamboo grove is considered the safest place to be during a quake.



Many animals, including the giant panda, red panda and dozens of bird species, depend on bamboo.

They eat the shoots and leaves, and even live inside the hollow culm.



project name: \_\_\_\_\_

**Asia Trail**

exhibit name: \_\_\_\_\_

**Section Interpretive Panel**

**HPL Graphic**

**3'-2" x 2'**

date: \_\_\_\_\_


**01.04.07**

page no. \_\_\_\_\_






1. National Zoological Park  
Smithsonian Institution




This is Sunita, a scientist in India. She and a team of partners, including the National Zoo, study wild red pandas.

7. National Zoological Park  
Smithsonian Institution




They were carried along a mountain path to the release site.

3. National Zoological Park  
Smithsonian Institution



She spots a track in the mud. That's one clouded leopard!

8. National Zoological Park  
Smithsonian Institution




Because of Zoo research, cubs have been born in breeding programs in Asia.

3. National Zoological Park  
Smithsonian Institution



One time, a Zoo fishing cat fell and hurt his leg. Carlos took an X-ray that showed a fracture.

6. National Zoological Park  
Smithsonian Institution



National Zoo scientists have set up camera traps in the forest in Thailand to learn about the cats' behavior.



project name: \_\_\_\_\_

**Asia Trail**

exhibit name: \_\_\_\_\_

**Science Look Station**

**HPL Graphic  
Cover: 18"**

**Graphic Transparency  
Slides: 2" x 2"**

date: \_\_\_\_\_ page no. \_\_\_\_\_

**01.04.07**

7



## Narrative

### I. Introduction

*“Asia trail is just great. It is just right. As the designers say: ‘This one sings to you.’ It is the best exhibit of its kind I have seen. It is great for the animals and the visitors. And the messages – the very complicated story of Asian conservation is told very well.”*

*John Seidensticker, National Zoo Senior Scientist*

Asia Trail represents the first phase of a 10-year renovation effort at the National Zoo. The six-acre exhibit, opened in October, 2006, provides varied viewing of seven Asian species in dynamic habitats designed to encourage natural behaviors. Inspiring nose-to-nose animal/visitor encounters, hands-on multi-sensory exhibits and innovative materials selected for sustainability make the Asia Trail experience second-to-none. Anchored on either end by sloth bears and giant pandas, the trail also features new homes for clouded leopards, fishing cats, Asian small-clawed otters, red pandas and Japanese giant salamanders.

The interpretive goals of Asia Trail are three-pronged:

- *Goal 1:* Introduce our visitors to the fascinating adaptations that enable these species to survive in Asia’s wild places
- *Goal 2:* Show how National Zoo efforts in conservation science play a central role in learning more about these species, and protecting them and their wild habitats
- *Goal 3:* Empower visitors to take action on behalf of Asian species

We used every tool at our disposal to accomplish those goals – from the physical design of the trail, animal habitats and viewing areas (the site), to interactive, content-driven exhibitions (the exhibits), and trained volunteer interpreters, on- and off-site programs, and rich Web materials (educational extensions).

#### *The site:*

Asia Trail incorporates a series of hidden buildings, tucked under the winding, often-elevated, ADA-accessible trail that runs approximately one quarter-mile. The buildings create safe, off-exhibit spaces for the animals at night; the creatures spend their days in outdoor habitats filled with natural and artificial rockwork, trees and deadfall for climbing and exploring, and clever features designed to draw the animals into public view. The giant panda exhibit, for example, includes a cold rock (cold-water coils run under fabricated rockwork) for visitors and pandas to cool off on hot days—their perches separated only by a thick pane of glass. For the clouded leopards, a warm branch in an artificial tree gives the tropical cats a toasty place to hang out in front of the visitor boardwalk.

#### *The exhibits:*

The interpretive visitor exhibition, the first major effort to be designed and developed entirely in-house, takes the Asia Trail experience one step further. Dismantling the



common notion of the National Zoo as simply a place, Asia Trail interpretation showcases a dynamic organization fulfilling far-reaching missions in science, conservation and education. To that end, we have created varied opportunities for visitors to carefully observe animal behaviors and then learn about the cultures and conservation dilemmas from those animals' range countries. Interactive exhibits let visitors see and hear the wild habitats; touch samples of the animals' fur, teeth and claws; view clever Viewmaster-style slideshows of Zoo science stories; and see actual tools used by field researchers in range countries. The Wild Signs give children a series of artistically fabricated animal clues to search for—an Indian python shed, red panda poop, tiger pug marks, monkey calls from the trees and cliff-swallow nests. Life-size, realistic bronze animal sculptures let children explore mass and shape. And multimedia kiosks let Zoo visitors get their photos snapped by a camera trap; struggle to make tough conservation decisions; practice pairing up giant pandas for genetic mating; and create personalized Asia Trail websites to continue learning from home.

*Educational extensions:*

More than 80 trained volunteers interact with visitors, introducing them to objects and stories about the animals on exhibit and their native habitats. Volunteers will be marked on site with tall, colorful flags, reading "Ask Me." Zoo educators have also developed (or are in the process of developing): (1) an interpretive-rich tour of the site for school groups and families; (2) a self-guided tour for elementary-age students to explore the exhibit on their own; (3) an activity guide for teachers that identifies appropriate pre- and post-visit activities and exhibit-based projects designed to help students discover, observe and learn about the species; and (4) a 30- to 60-minute exhibit program conducted by animal-care staff or volunteer interpreters that focus on various content themes.

## **II. Audience Awareness**

*"This exhibit is the zoo of the twenty-first century. I am very, very excited! ... I can hardly wait to bring my friends, my students, and even my ninety-year-old parents to see it! Think of what changes my folks have seen in zoos in their lives! I almost was hopping up and down this evening being on the trail for the first time."*

*Kenneth Lawwill, National Zoo volunteer*

- Asia Trail has received heaps of enthusiastic accolades from visitors. Through anecdotal evidence and more formal evaluation, we are confident that Asia Trail continues to surpass the goals set out for the exhibit from the beginning. The evidence: Teachers have already begun to use Asia Trail as a tool for talking about biology and conservation; groups discuss aloud their options at the decision station kiosks; children mimic the sounds and movements of the animals they see; and families team up to search for the signs of wild animals along the pathway.
- The intended audience for Asia Trail was as broad as the Zoo's visitorship – local, national and international visitors in family and school groups that represent a range of ages, abilities and attention spans.
- To reach that range, we designed the interpretation to connect with visitors on a variety of levels (literally and theoretically) and in a variety of formats. We used



height to our advantage, placing text (on the Animal ID signs, for example) higher for adults than objects and illustrations designed for children. To appeal to different learning styles, we incorporated illustration, photographs, tools from range countries, touchable bas reliefs and fur samples, animal scents, audio of animal calls, and other things to touch and explore.

- The content is layered to allow novices to learn about why, for example, our scientists study giant panda breeding. Novices can watch the short video of cub Tai Shan's birth and use audio calls, a scent station and sliding graphics to learn about mating. More advanced learners can explore how artificial insemination works, and what scientists look for under the microscope to ensure success. And experts can read online reports about breeding successes linked through our Curiosity Station exhibit. This layering repeats itself throughout the exhibit.
- While several of the exhibits, like the in-depth decision stations, ask visitors to take significant time and mental energy, others accommodate brief visits and quick-hit learning experiences. (As an example, large font key phrases in longer paragraphs highlight main points for skimmers.) Celebratory exhibits drive home Goal 1 with brief visceral experiences; more involved exhibits that focus on Goals 2/3 encourage visitors to stay longer, ask questions and search the exhibit for answers.
- We created a variety of physical visitor spaces – some indoors or covered, some for large groups to gather, some sneak-peek views for individuals. We developed larger spaces in areas where we wanted groups to work together (conservation geography map tables, decision station interactive video kiosks), and more intimate spaces for individual experiences (curiosity station Web portals, log books/scopes for visitors to learn about animal behaviors, look station science slideshows).

### **III. Content**

*“The Asia Trail is magnificent! You guys have done an impressive job of putting it together. I've been raving about it to my colleagues and they can't wait to see it. And special thanks for the Terai Arc/India section. I think it really explains what we're trying to do there.”*

*Lee Poston, Communications Director, WWF-US*

- Content development for Asia Trail was challenging because of the breadth of animals in the exhibit and the range of science those animals represent. More than a dozen Zoo scientists were included in content development, as well as keepers, curators, range country conservationists and others. We kept the content on exhibit explicit and literal – real people, real objects, real stories. We used tools from our scientists, quotes from their work, and reproductions of objects used in the field – biogas stove, mushroom farming, beekeeping.
- Objects are integral to our story-telling – we display tools that scientists use in their work – camera traps, radio collars, semen shipping canisters – and items from our long history in the field of giant panda research – crate from Ling Ling, cards and letters, newspaper clippings, etc.
- Working closely with our scientists, we verified current range maps, received critiques and feedback on our sculpture and illustration, and reviewed best practices



in lab and field science. We also kept the content current by incorporating travel to Asia – Thailand, India and China in three different trips – to see the places we were interpreting, meet people involved in conservation on the ground there, and tell their stories.

- We had significant press interest throughout the process, particularly with the birth of giant panda cub Tai Shan. As a result of the birth, we added an entire section to the exhibit about the process of Tai’s birth, including video and audio of the birth and a description of the process followed.

#### **IV. Collections**

*“I do work all the time for interior and exterior exhibits now but it is rare for me to feel true pride for participation. I am very proud to be represented in this exhibit.”*

*Bob Hynes, illustrator*

- While we don’t have an object collection in the traditional sense, Asia Trail is an absolutely top-notch exhibit for animal care. The outdoor animal spaces are large, with enrichment built in, and the state-of-the-art indoor spaces give the animals comfortable homes during inclement weather. The exhibit spaces allow for excellent keeper daily care, regular veterinary checks, and ongoing learning through behavior observation, hormone monitoring and other needs.
- Other needs are also accommodated: water filtration, feeding, enrichment, heating/cooling, transfer between indoor and outdoor spaces, etc.
- Close-up views give our visitors a chance to observe animal behaviors through glass or across moats – and set a new standard for animal exhibition at zoos.

#### **V. Interpretation/Communication**

*“I am just amazed at the way the Asia Trail came together – it’s really a fantastic experience for visitors. Thanks for taking the time to get the science side integrated. While this is one of the top priorities for NZP, I know it is not easy to do. You and the team did an incredible job; congratulations to all of you!”*

*Melissa Songer, National Zoo Scientist*

- Asia Trail, as an exhibit title, is intended to give visitors a sense for the exploration and movement required as part of animal conservation work.
- A regular series of exhibits (Built to Survives, look stations, log books, etc.) reappear in several animal areas. Interactions are designed to be intuitive, and the content for each exhibit element carries the same theme. For example, the look stations tell National Zoo science stories through a series of short Viewmaster-style slide shows. The format is consistent from animal to animal; only the story changes. In that way, parents and children know what to expect as they move through the experience.
- Each exhibit goal has a series of exhibits specifically designed to reinforce that message: Goal 1 by the log books and built to survive interactives, Goal 2 by the Notes from the Field and interactive sign exhibits, and Goal 3 by the decision stations and conservation geography experiences.

- Media is used to engage with audiences on a deeper level, enabling access to audio of wild forests, video interviews with people in range countries, links to personalized Web materials, and insider views into animal management and veterinary medicine. Media navigation is consistent within and across exhibits.
- We also use the Web to its fullest, incorporating a brand new Asia Trail website and audio-guide narrated by Dakota Fanning. Please see <http://nationalzoo.si.edu/asiatrail/> for more details.

## **VI. Design and Production**

*“I was simply astonished to see how spacious the exhibit was, how the winding trails made so much more out of comparable acreage than traditional buildings and cages. Of course, the exhibits themselves and the beautiful landscaping are stunning as well. I’m quite used to being delighted by the specimens in the zoo, but I have to say that the design of Asia Trail provided the very same feeling. Again, all of your collective efforts have really paid off, in ways that have surpassed even what I could have imagined.”*

*Christine Pinkowicz Craig, Zoo Visitor*

- The Asia Trail circulation can run either top to bottom, or bottom to top, as shown in the attached route plan. The giant panda circulation is a one-way loop, and can be completed before or after walking the length of the Trail. This is clearly labeled on the National Zoo map.
- Each exhibit is marked by a bamboo bundle with an orientation sign naming the animal in that exhibit area and ID signs giving the basic animal stats.
- More than 25,000 native and Asian plants (many of which are labeled or interpreted) enhance the landscape, creating the look of natural habitats and allowing the line between visitor space and animal space to blur. This literally emphasizes the connection between people and animals.
- The landscape design features durable Ipe wood decking, natural resin-bound aggregate paving instead of asphalt, and a rustic/modern mix of materials (juxtaposing rusted corten steel and bamboo with stainless steel mesh and exposed hardware). These materials, selected after visits to the countries to be represented in the exhibit, were chosen to reinforce the themes of place and local culture as a significant element of conservation.
- The exhibit conceals animal containment—painted steel bamboo mixed with real bamboo, large artificial boulders and cliffs designed to mesh with the Rock Creek Park geology, thick panes of glass to get visitors and animals close, and deep, concealed moats to minimize the bulky visual interference.
- Designed as a cohesive immersion experience, Asia Trail incorporates a fogging system to replicate the misty mountains of China, rivulets of water running across the visitor pathway, and a dripping wet grotto for people to view the giant salamander in character.
- The project integrates many sustainable features, from green roof systems to solar hot water, clerestory windows and skylights, recycled and environmentally friendly construction materials, and full protection for the site’s heritage trees. In the fall, Asia Trail won the Washington, DC, AIA Award for Sustainability.



- The graphics' simple lines, earthy color palette and clean fonts support our straightforward interpretive goals.
- Three illustrators applied a mix of modern (computer-based) and traditional (painting) techniques to enhance the graphics and recall the modern/traditional use of materials.
- Full-color high-pressure laminate graphics are interspersed with pressed bamboo and painted wood panels as part of a flexible panel system that allows for updating and changing exhibit content.
- Two conservation plazas support intensive interpretive experiences, and are framed by large (12' high in most cases) photographs from staff travel to China and India. Through photographs, moving images on large 50" plasma screens and audioscape, the faces and voices of people living on the borders of protected wildlife parks fill these spaces.

## **VII. Ergonomics**

*“Visitors to the zoo should find more comfort and more fun, too. Cooling rocks and misters near the glass enclosures should attract both humans and animals during the hot summer months – and hopefully cajole sometimes reclusive species out of hiding.”*  
*The Washington Post, 10/17/06*

- Asia Trail is fully accessible for visitors in wheelchairs with ramps and platforms for wheelchair-bound visitors, readable font sizes and colors, appropriate reach distances for children and the disabled, and seating areas and shade for the elderly and young.
- Rocks and stone walls serve as seating and large trees and tensile fabric shade structures offer shading.
- Label text is informal, fun and easy to engage with. It is often supplemented with visual aids, and was carefully evaluated for age appropriateness during several stages of development.

## **Institutional Profile**

The National Zoo is a 163-acre zoological park set amid Rock Creek Park in the heart of Washington, DC. Open to the public 364 days a year, we are home to 2,000 individual animals of nearly 400 different species. The Zoo is one of Washington's most popular tourist destinations, welcoming up to 3 million visitors ever year, free of charge.

As part of the Smithsonian Institution, the world's largest museum and research complex, the National Zoo represents a diverse organization with a multifaceted mission. We provide leadership in animal care, science, education, and sustainability. For sure, the National Zoo is a place where people can marvel at wonderful animals, learn about wildlife and its conservation, and enjoy a beautiful, peaceful experience among our gardens. But we are also a research, conservation and education center for endangered species, boasting a state-of-the-art veterinary hospital and extensive research facilities.

In addition:

1. The National Zoo represents an extraordinarily dedicated and talented staff, internationally recognized for our expertise as zoo professionals and for our collaborative work in global conservation.
  - The National Zoo works with other zoos, conservation organizations, universities, governments, and other partners all over the world.
  - Members of the National Zoo staff work in multiple places: the exhibits and behind-the-scenes at the Zoo, at the Conservation and Research Center (CRC) in Virginia, and in field sites around the world.
  - We have a strong private partner in Friends of the National Zoo (FONZ), a membership-based organization with a dynamic and highly capable staff.
2. The National Zoo has a long history of innovation and leadership in the care and exhibition of wild animals. Today, our exhibits are more than just places within the Zoo; they include educational and scientific programs both on-site and around the world.
  - Our collection is diverse and includes animals from ants to elephants, representing habitats from tropical rainforest to local woodlands.
  - Our exhibits promote the natural behavior and well-being of animals.
  - Education and scientific research are integral parts of our exhibits.
  - Our exhibits let people get close to animals and to keepers and volunteers who enhance the visitors' experience.
3. The National Zoo has a long history and strong commitment to the scientific study and conservation of animals and their habitats throughout the world.



- The National Zoo was one of the first to support scientific research involving the species represented in its exhibits, as well as their relatives and other species of concern.
- Zoo scientists work collaboratively with scientists from other zoos, conservation organizations, universities, governments, and non-governmental agencies all over the world.
- The strength of our scientific research is in reproductive biology, veterinary medicine, behavior, conservation ecology and nutrition, population management, biodiversity monitoring, and professional training in these disciplines.
- The health care we provide for our animals incorporates the most sophisticated advances in veterinary medicine.
- We train future zoo and conservation professionals in veterinary medicine, wildlife management, and other disciplines, and we share our expertise with other zoos and conservation organizations in the United States and abroad.

## **Educational Approach**

### **Our Educational Mission**

Our educational mission at the National Zoo is to teach and inspire people to understand, appreciate, and conserve wildlife and habitats. Our staff of educators is committed to continually exploring and refining ways to accomplish this. Current research points to the importance of affective learning as perhaps “the” key to moving visitors from exposure to facts about a particular species to encouraging a feeling of personal connection, of caring for the animals and the natural world. This has led to changes in exhibit design with increasing opportunities for visitors to get very close to the animals, separated only by a pane of glass.

Simultaneously, conservation educators have placed more emphasis on helping the visitors translate that sense of connection to the animals into actions they can take to help wildlife, both in their own backyards and around the world. Research about how to influence human behavior, drawn from fields including social marketing and conservation psychology, continues to inform how we can help people make a difference.

Therefore, the exhibit goals carefully draw visitors from appreciating and observing animal adaptations, to urging them to action. The goals of Asia Trail are three-pronged:

- *Goal 1:* Introduce our visitors to the fascinating adaptations that enable these species to survive in Asia’s wild places
- *Goal 2:* Show how National Zoo efforts in conservation science play a central role in learning more about these species, and protecting them and their wild habitats
- *Goal 3:* Empower visitors to take action on behalf of Asian species

We used every tool at our disposal to accomplish those goals – from the physical design of the trail, animal habitats and viewing areas, to interactive, content-driven exhibitions, and trained volunteer interpreters, on- and off-site programs, and rich Web materials.

### **Multiple Levels of Entry**

Rather than narrow our audience, we worked hard to vary the types of exhibits and content styles in order to reach a broad range of visitors. We used height, media and various senses to our advantage, directing some information at adults and other types of information at children. Of course, that presented a huge challenge – how can you be all things to all people? Our answer was that we wanted for each of our audiences to have different access points for connecting with content.

For example, when trying to accomplish Goal 2, a child might compare his own feet to the large boots on display from scientist John Seidensticker and wonder about how far he might have walked through the forest looking for sloth bears. An adult couple might examine the slides of normal and abnormal sperm in the panda house to learn about Zoo research. A family might look through the blue look stations to learn the story of a



clouded leopard camera trap project our scientists manage in Thailand. A school group might trip the camera trap or look for the Wild Sign clues (poacher's snare, red panda poop, snake shed, etc.) to learn about how our scientists study animals in the wild.

We also use the Web to its fullest, building (with our sponsor Fujifilm) a brand new Asia Trail website and audio guide narrated by Dakota Fanning. The downloadable audio tour gives visitors a behind-the-scenes peek at the design of Asia Trail, and enhances the content of the on-site exhibits. The tour uses the voices of Zoo staff to talk about the animals and the trail itself. The stand-alone website relies heavily on photography of the animals and their habitat to tell the story of conservation and Zoo science. Please see <http://nationalzoo.si.edu/asiatrail/> for more details.

### **Community and Diversity of Opinions**

The Zoo community and our local Washington, DC, community, were both an integral part of the Asia Trail development process. We held numerous sessions over five years to discuss design plans and give construction updates. Of particular interest to our direct neighbors, we reacted to concerns about aesthetics and plantings, beefing up or adjusting plans as appropriate. Our community could also follow the progress of the exhibit through designs and information on the Web, as well as our Asia Trail cam that captured the progress on video (they could even watch a time lapse image that showed progress over the years). And finally, we set up bleachers for visitors to stop and watch, learning about the exhibit from our progress graphics and observing the large trucks move the earth over a two-year construction process.

We integrated a diversity of perspectives into the project by traveling to the countries we represented in the exhibit. Through trips to India, China and Thailand, we were able to integrate the opinions and perspectives of the cultures living in and near the animals' habitat. That enabled us not only to appeal to our international audiences, but to ensure that we were telling the *right* stories and representing them in as honest a way as possible. The faces and voices on exhibit, then, enable our visitors to put a face to conservation, to understand its real consequences and challenges, and to make a more emotional connection to the content.

### **School/Public Programs**

#### Volunteer Interpreter Program

Friends of the National Zoo (FONZ) manages a number of volunteer interpreter programs specific to different exhibits around the park. Volunteer interpreters are trained to engage visitors in informal education experiences, sharing information about the animals' lifestyles, care, and significance of their conservation, in a manner that is relevant and stimulating to the audience. The Asia Trail exhibit is a focal point in two of the Zoo's volunteer interpreter programs: (1) the Zoo Guide Interpreter Program, in which volunteers conduct tours (including one that encompasses Asia Trail), and (2) the original Giant Panda Interpreter Program, which has been expanded into a larger Asia Trail Interpreter Program.

Zoo Guides are trained to provide visitors with focused, informational and interesting excursions through the Zoo. The tour that covers portions of Asia Trail highlights the adaptations and conservation science for several of the species on exhibit.

In the Asia Trail Interpreter Program, volunteers interpret primarily through informal conversations and object-based inquiry, ranging from short, simple exchanges of basic information to in-depth discussions of complex conservation topics. Volunteers also occasionally conduct semi-formal presentations to accompany animal demonstrations (for example, at our sloth bear feeding area, volunteers describe the animals' feeding habits as keepers showcase the sloth bears' sucking process by feeding meal worms through long tubes that run from the visitor amphitheater into the animal exhibit). Volunteers in the Asia Trail Interpreter Program receive extensive training to develop and share their knowledge about the natural history, individual history, Zoo management practices and conservation issues associated with the species in the exhibit. Interpreter training involves three main components, summarized as Knowledge of the Resource, Knowledge of the Audience, and Appropriate Techniques.

#### *Knowledge of the Resource*

Interpreters' knowledge about the Zoo and the exhibit's collection is based on training by Asia Trail animal care staff. The exhibit's key interpretive messages are emphasized as integral to understanding the resource.

#### *Knowledge of the Audience*

Visitors to the National Zoo vary greatly in age, geographic origin, knowledge level, perceptions, biases and expectations. Interpreters help visitors to feel welcome in the exhibit, but do not overwhelm them with information. The interpreters' mantra regarding knowledge of the audience is "do not overestimate the visitors' knowledge nor underestimate their intelligence."

#### *Appropriate Techniques*

The interpretive technique is the manner in which knowledge is shared. Conversation is the primary interpretive technique used by volunteers. Interpreters use several interpretive approaches within the context of the conversation, such as asking questions of a group, encouraging close observation of the animals, engaging visitors with the interactive exhibit components and sharing hands-on objects. Objects that Asia Trail and Zoo Guide interpreters share with visitors include skulls, pelts, fecal samples, and photos.

#### Teacher Resources

In addition to interpreter-based education available to the general public, FONZ provides resources designed specifically for teachers to use in their classrooms and during field trips.

#### *Student Self-Guide*

The FONZ public education office is currently developing a self-guided "tour" of Asia Trail that directs students to explore specific features of the exhibit. Students using the



guide will refer to the exhibit's interpretive graphics and interactives to answer questions and discover animal and conservation information. This self-guide will be pilot-tested with four classes of second graders in February 2007 and will then be adapted for multiple grade levels. It will be available to download for free from the Zoo's website or in hard copy from the public education office.

#### *Activity Guide*

Many of the Zoo's exhibits have accompanying Activity Guides. These resources contain teacher background information, pre- and post-visit activities, and exhibit-based activities or projects designed to help students discover, observe, and learn cooperatively. An Asia Trail Activity Guide is under development and will be available to download for free so that teachers can make copies for students and chaperones.

#### *Exhibit Program*

School groups visiting the Zoo can participate in 30- to 60-minute programs that focus on various science topics related to an exhibit. These programs are conducted by animal-care staff or volunteer interpreters and must be scheduled in advance. The cost is \$20 per session and class size is limited. An exhibit program specific to Asia Trail will likely be offered on a weekly basis starting with the 2007-2008 school year. Possible themes will include carnivores, umbrella species, and adaptations for arboreal lifestyles.

## **Audience Awareness and Evaluation**

### **Planning for Our Audience**

The intended audience for Asia Trail is as broad as the Zoo's visitorship – local, national and international visitors as individuals, family or school groups that represent a range of ages, abilities and attention spans. Rather than narrow our audience, we worked hard to vary the types of exhibits and content styles used in order to reach a broad range of visitors. We used height, media and various senses to our advantage, directing some information at adults and other types of information at children. To inform our design, we used front-end, formative and summative evaluation to understand how best to tell our stories, how to engage our various audiences, and how to meet their needs and expectations.

### **Front-End Evaluation**

Front-end evaluation helps exhibition teams gain an understanding of the knowledge, assumptions, and perceptions their visitors bring to a topic. It's critical to survey visitors prior to content development so that content is presented in a way most likely to engage audience attention.

The National Zoo conducted a series of front-end evaluations in 2000, 2002, and 2003, working with Museum Education graduate students at George Washington University. At first, studies focused generally on topics relating to giant pandas, endangered species, and conservation. Early in Asia Trail's development, giant pandas were the only species we were certain to exhibit. We wanted to know what visitors already knew about pandas, how species tend to become endangered, and the kinds of actions that can help protect them. Later studies engaged broader issues of Asian species, specific conservation activities in which the Zoo is involved, and actions visitors can take to advance species and habitat conservation.

The last set of studies focused on two specific exhibit elements that we were considering developing—Curiosity Stations and Conservation Geography exhibits. In the Curiosity Station study, we addressed whether visitors would feel comfortable giving the Zoo their email addresses and queried how likely they would be to participate in an email-based activity. The positive response we got from visitors gave us the validation we needed to pursue this element. The Conservation Geography study asked visitors questions about Asian geography and helped us decide the specific places to include in this exhibit element.

All of the front-end studies provided us with critical information as we developed content for Asia Trail. We learned that Zoo visitors are generally knowledgeable about issues surrounding endangered animals and habitat loss, so we felt comfortable pursuing some depth in these topics. Conversely, Zoo visitors, like many Americans, had little knowledge of geography in Asia, so we knew that we would have to approach this topic at a very basic level.



## **Formative Evaluation**

As we continued with exhibit development, we conducted formative evaluation and prototyping to test specific exhibit elements with our target audiences.

### *Graphics*

We developed prototypes of the various graphic components, in particular the Animal and Plant identification signs and markers, the Built to Survive exhibit and tabs (animal adaptations), the log books (animal behavior observation) and Wild Signs (field research skills). For each, we were looking for feedback on clarity of content and messages, readability (fonts/size, reading level and tone), navigation (did they know what to do or how to make it work), organization, and visuals (photos, maps, illustration, etc.). We also wanted to make sure they were learning what we wanted them to learn from the exhibit.

Prototype testing was used to establish the effectiveness of the graphic panels (with respect to content and aesthetic issues) prior to final design. Random National Zoo visitors (alone and in groups as large as 5) were questioned about specific aspects of the individual panel content and designs. After the initial testing, the team discussed the test results and made modifications as necessary. In those cases, the team felt that changes would help improve understanding or improve the interactive experience. As appropriate, a second test was conducted to determine the effectiveness of the modifications.

### *Multimedia*

All of the multimedia was tested several times. First, we presented the concept to visitors to gauge interest. Then, we used a rough paper prototype of the screens to begin testing navigation and sequencing, followed by two rounds of computer-based prototype testing. We developed scenarios of use for each component, scripting the experience for specific audiences to determine how they would be used and how to make the various features more effective for our target audiences.

For the Curiosity Station kiosk, for example, we followed up on one of the front-end studies and asked visitors whether they would submit an email address to create a personalized website. We received positive feedback and moved a step further. A paper prototype was developed with potential dummy text to see how the navigation would work, and determine a proof of concept. Several rounds of computer-based testing led to significant changes to streamline the content and make navigation easier. We reversed the order of several pages to give a clearer idea of the purpose for the exhibit. Based on numerous concerns about how the email addresses would be used, we added a disclaimer that the National Zoo would only send the visitor one email. We reduced the number of words on the introductory page to simplify the overview, and decided to offer questions that visitors can get answered, rather than generic topics of interest. In terms of navigation, we decided to make the buttons look and act more like buttons, and added in feedback for visitors as they move through the experience.

The same process was used for the Decision Stations – first paper prototypes, then computer-based, then several rounds with the near-finished product. We made significant changes to the kiosk (in terms of navigation and content) based on what we learned. For example, we allowed visitors to decide about the conservation issue before hearing the various in-situ perspectives, and then again afterward. The original prototypes allowed only one voting round, but the testing showed that we needed to engage visitors earlier in the (comparatively long) interactive.

### *Interactive Prototypes*

We also prototyped and tested several of the interactive elements – the Built to Survive adaptations exhibit with pull tabs, the camera trap, the log books with yes/no questions and knobs, and the topographic map. These tests were about ease of use, durability, aesthetics, reliability, and materials, among other issues.

Many elements of the interactives were adjusted based on testing, including rubber stoppers for safety, different spring mechanisms to increase reliability, and new materials and attachment details based on durability. The camera trap moved from using a trip mechanism that used changes in the screen shot to trigger the camera to an infrared mechanism that triggers the camera as visitors trip the switch. These tests were not conducted with visitors on site, but were completed in the Hadley Exhibits fabrication shop in Buffalo, NY. They were left out on the shop floor for visitors to play with to evaluate durability and ease of use.

### **Summative Evaluation**

We are currently developing our summative evaluation methodology and instrument to determine what visitors are learning and how they are using Asia Trail exhibits. The evaluation will query a random sample of visitors representing different ages and abilities using a rating “check all that apply” survey. We will evaluate the quality of the visitor experience (path widths, view rail, etc) as well as how well visitors understand the exhibit’s content and messages. The survey will be conducted three times in the coming year by the Smithsonian’s Office of Policy and Analysis, during different seasons and different days of the week, to assess how the visitor and learning experience varies.

We are also collecting data on kiosk usage, which we can manipulate. In the past month since the exhibit opened, the decision stations have been started 2,083 times, with 1,273 stories completed, a 61% completion rate. We can observe the times of day that the exhibits are most heavily used, which stories attract the most attention, and evaluate whether we need to strengthen specific stories. We know that 670 stories have been completed in the China conservation plaza and 513 in India. And our Web version has only been completed 85 times – a clear indication that we need to provide better access to it online. As for the Curiosity Station personalized website exhibit, we have had 3,751 emails sent to 3,395 email addresses. Of those, 40% have been read at home and linked to the website for exploration. We now need to devise methods for improving that read-percentage.



In sum, we have been engaging visitors in the content, design, and fabrication of Asia Trail exhibit elements for over six years, in all phases of audience research. This effort not only ensures that Asia Trail is responsive to visitor needs and experiences, but also helps us better understand our audience as we plan future exhibits.

## **Exhibition Staff**

This was the first major in-house interpretive design effort at the National Zoo. Key in-house staff completed all concept design, schematic development and graphic design as well as all content development. Exhibit detailing, fabrication and installation were completed out of house. Architectural and landscape design were also completed by contractor firms.

### *In-House Staff*

**Susan Ades** is the head of the Zoo's Office of Exhibit Planning and Design. She oversaw the concept and content development of Asia Trail, and managed the exhibit budget.

**Kara Blond** was the project manager and content developer for Asia Trail. Kara researched content with the help of Zoo scientists, oversaw script development, managed the prototyping process, maintained schedules and managed the various contractors and subcontractors on the project. Kara jointly managed the fabrication and installation process.

**Amanda Perez** was the art director on the project, completing all significant graphic design and some 3D design work. She selected the color and font palettes, chose materials and approved all sculpture and illustration design. Amanda jointly managed the fabrication and installation process.

**Josh Williams** was the multimedia developer and programmer for Asia Trail, creating the front- and back-end of the interactive kiosks, testing and selecting equipment, and managing the multimedia contractors.

**Benin Noble** was the junior graphic designer on the project. He was responsible for photo research, graphic design and managing production files.

**Ken Stuart**, who left the Zoo in 2005, was responsible for the concept and schematic 3D designs for Asia Trail interpretation. Ken coordinated all site requirements with the architects and landscape architects, and art directed the rockwork design for the Zoo.

**Marc Muller**, construction manager at the Zoo, oversaw all construction activities on site.

**Karen Swanson**, construction management liaison, coordinated construction activities between the Zoo, construction management firm Bovis Lend Lease, and the Hensel Phelps construction team.

**Eric Mucklow**, design manager for Asia Trail, oversaw the architectural and landscape architecture development process.



**Tony Barthel, Lisa Stevens and Michael Davenport**, animal curators for the exhibit, contributed content and reviewed script and graphic development.

**Pat Petrella, Amy Miller, Nette Pletcher, Helen Moore and Pam Mercer** made up the education team that developed the volunteer training program and coordinated the activity and program guides for the exhibit.

**John Seidensticker, Jon Ballou, Jo-Gayle Howard, Melissa Songer, Bill McShea, David Wildt and Suzan Murray** represent a subset of the scientists who contributed their knowledge and expertise to the project in the form of content reviews, travel coordination and interpretive planning.

#### *Contractors*

**Hadley Exhibits** completed detailing, fabrication and installation of the Asia Trail interpretive exhibits.

**Electrosonic** completed the media integration and installation for Asia Trail interpretive exhibits.

**Chatelain Architects** of Washington, DC, completed all of the architectural design for the exhibit. They managed all of the design subs, including electrical, MEP, security, landscape, rockwork, etc., for the design team.

**Nelson Byrd Woltz Landscape Architects** of Charlottesville, VA, completed all of the materials selection, planting plan and lighting design for the exhibit.

**Hensel Phelps** completed the construction and construction management of Asia Trail.

## **Asia Trail Exhibition Budget**

### **Direct Exhibition Costs**

Fabrication and Installation	\$1,750,000
(includes construction of all exhibit elements as well as prototypes, media, interactives, mannequins, painting, photo reproduction, lighting supplies, and similar costs)	
Staff expenses	\$250,000
(includes travel, books, office supplies, etc. -- excludes salaries)	
Collections	\$5,000
(includes conservation, shipping, loans, storage and other related expenses)	
Consultants	\$180,000
(includes fees and expenses related to content experts, designers, evaluators, etc.)	
Total Direct Exhibition Costs	\$2,185,000

### **Additional Project Costs**

Educational Programs and Materials	\$10,000
(includes presenters' honoraria and expenses, printing, curriculum materials, etc.)	
Publications	\$65,000
(includes print and electronic materials including catalogues, gallery guides, websites)	
Marketing	\$25,000
(includes advertising, publicity, and related costs)	
Total Additional Project Costs	51,000,000
(including site construction and landscaping for animal exhibits and visitor spaces)	

### **GRAND TOTAL**

(Direct Exhibition Costs + Additional Project Costs) \$53,285,000