



Russia's Grizzly Coast
and Central Plaza



MINNESOTA ZOO[®]
Changing how you see the world




Table of Contents

Section A: Candidate.....	3
Section B: Applicant/Submitter.....	7
Section C: Construction Information.....	9
Section D: Narrative.....	11
Section E: Illustrative Material	16
Exhibit Plans	17
Photographs	29
Media Samples	49
Section F: Recognition	51
Section G: Media Release	53
Appendix 1: Summative Evaluation	
Appendix 2: Construction Conservation Facts	

Russia's Grizzly Coast is the most significant exhibit project since the Zoo's original construction and the first anywhere to feature the region, landscapes, and animals of the Russian Far East: one of the world's last great wildernesses.

Russia's Grizzly Coast is transformative for the Minnesota Zoo. Public perceptions of the Zoo, the ways guests use the facility, fundraising, and our conservation programs are all fundamentally changed for the better as a result of this project.



“Fantastic. [Russia’s Grizzly Coast] greatly improved what the Minnesota Zoo was. It was a great zoo and now it’s even better.”

- Quoted in Summative Evaluation

Candidate

Section

A

Section A - Candidate

Title of Exhibit:

Russia's Grizzly Coast and Central Plaza

Has this program previously been submitted for an AZA award?

No

Number of personnel maintaining exhibit on a daily basis:

3.0FTE Sea otter Trainers

1.5FTE Keepers for bears, leopards, boar

0.5FTE Life Support Operator

2.1FTE Interpretive Guides (during high season only)

1.0FTE Engineer (Splash Pad operation and maintenance; RGC mechanical system support)

1.0FTE Horticulture (RGC and Central Plaza planting care and replacement)

0.5FTE Licensed Trades (plumbing, electrical, and other shop support)

0.5FTE Building Services (ongoing cleaning of restrooms, EEC, cabin)

3.0FTE Grounds (trash and recycling handling, snow removal, exhibit glass cleaning ...)

Species or specimens contained in exhibit: Animals

Northern Sea Otter (*Enhydra lutris kenyoni*)

3.0 on permanent loan from USFWS, Born May 2006, June 2007

Brown Bear (*Ursus arctos*)

2.1 on permanent loan from Alaska Fish and Game Dept, born approx. Jan, 2006

Amur Leopard (*Panthera pardus orientalis*)

0.1 on loan from Audubon Zoo, born October 2006

0.1 imported from Mulhouse Zoo, born April 2006

1.0 import pending from Olomouc Zoo, Czech Republic (summer 2009)

Wild Boar (*Sus scrofa*)

1.0 born 2005, purchase from Shadow Nurseries, TN

0.1 born 2003, purchase from Shadow Nurseries, TN

4.3 born 2008 at Minnesota Zoo



Section A - Candidate

Species or specimens contained in exhibit: Plants

“Pacific Coast” Zone

Herbaceous Material

<i>Achillea ptarmica</i>	Sneezeweed
<i>Anemone nemorosa</i>	Spring Pasqueflower
<i>Artemisia stellerana</i>	Dusty Miller
<i>Calamagrostis</i> ‘Karl Foerster’	Feather Reed Grass
<i>Campanula</i> ‘Birch Hybrid’	Birch Hybrid Bellflower
<i>Chrysanthemum wayrichii</i> ‘White Bomb’	White Bomb Daisy
<i>Deschampsia caespitosa</i> ‘Schottland’	Schottland Tufted Hairgrass
<i>Penstemon hirsutus pygmaeus</i>	Beardtongue
<i>Potentilla megaiantha</i>	Strawberry cinquefoil
<i>Potentilla verna nana</i>	Spring Cinquefoil
<i>Primula cortusoides</i>	Primrose
<i>Sedum kamtschaticum</i>	Kamchatka Stonecrop
<i>Waldsteinia ternate</i>	Barren Strawberry

Shrubs

<i>Berberis koreana</i>	Korean Barberry
<i>Empetrum nigrum</i>	Crowberry
<i>Rhododendron mucronulatum</i>	Korean Rhododendron
<i>Vaccinium uliginosum</i>	Bog Bilberry

Trees

<i>Picea abies</i>	Norway Spruce
<i>Picea mariana</i>	Black Spruce
<i>Picea omorika</i>	Serbian Spruce

“Volcanic North” Zone

Herbaceous Material

<i>Acontium fischerii</i>	Monkshood
<i>Angelica archangelica</i>	Garden Angelica
<i>Aquilegia flabellate</i>	Fan Columbine
<i>Aralia cordata</i>	Japanese Spikenard
<i>Aruncus diocus</i>	Goatsbeard
<i>Carex muskingumensis</i>	Palm Sedge Grass
<i>Carex plantaginiae</i>	Wide leaf Sedge
<i>Cimicifuga simplex</i>	Bugbane
<i>Dryopteris dilatata</i>	Spreading Wood Fern
<i>Dryopteris expansa</i>	Wood Fern
<i>Filipendula camtschatica</i>	Manchurian Meadowsweet
<i>Filipendula palmate</i>	Siberian Meadowsweet
<i>Geranium praetense</i>	Meadow Cranesbill
<i>Geum macrophyllum</i>	Large-leaf Avens
<i>Heracleum lanatum</i>	Cow Parsnip
<i>Iris setosa</i>	Beachhead Iris
<i>Polygonum bisorta</i> ‘Superba’	Bistort
<i>Solidago cutleri</i> ‘Goldrush’	Goldrush Goldenrod
<i>Trollius chinensis</i>	Globe Flower
<i>Veratrum viride</i>	False Hellebore

Shrubs

<i>Aralia elata</i>	Japanese Aralia
<i>Arcostaphylos uva-ursa</i>	Bearberry
<i>Betula nana</i>	Bog Birch
<i>Ledum groenlandicum</i>	Labrador Tea
<i>Lonicera caerulea</i>	Honeyberry
<i>Rosa acularis</i>	Prickly Rose
<i>Rubus urinus</i> ‘Darrow’	Darrow Blackberry
<i>Salix nakumurana</i> ‘Yezo-Alpina’	Yezo-alpina Willow
<i>Salix purpurea</i> ‘Nana’	Dwarf Blue Arctic Willow

Section A - Candidate

Salix purpurea 'Pendula'
Salix repens 'Boyd's Pendulous'
Sorbus scopulina
Vaccinium corymbosum 'Top Hat'
Vaccinium vitis-idaea

Weeping Arctic Willow
 Boyd's Pendulous Willow
 Dwarf Mountain Ash
 Top Hat Blueberry
 Cowberry

Spirea japonica 'Norman'
Spirea nipponica 'Snowmound'
Sorbaria sorbifolia
Spirea x billardea
Viburnum sargentii 'Onodaga'

Norman Japanese Spirea
 Snowmound Spirea
 Ural False Spirea
 'Triumphans' Spirea
 Onodago Viburnum

Trees

Betula nigra 'Heritage'
Larix laricina

Heritage River Birch
 American Larch

Trees

Betula platyphylla 'Whitespire'
Carpinus betulus
Corylus colurna
Pinus sylvestris
Pinus resinosa
Populus tremuloides
Prunus maackii
Quercus bicolor
Quercus macrocarpa
Ulmus 'Accolade'

Whitespire Birch
 Hornbeam
 Turkish Filbert
 Scotch Pine
 Red Pine
 Quaking Aspen
 Amur Chokecherry
 Swamp White Oak
 Bur Oak
 Accolade Elm

"Forested South" Zone

Herbaceous Material

Adenophora latifolia
Adiantum pedatum
Athyrium filix-femina
Dryopteris filix-mas
Lilium pardalinum
Matteucua struthiopteris

Lady Bells
 Maidenhair Fern
 Lady Fern
 Male Fern
 Leopard lily
 Ostrich Fern

Shrubs

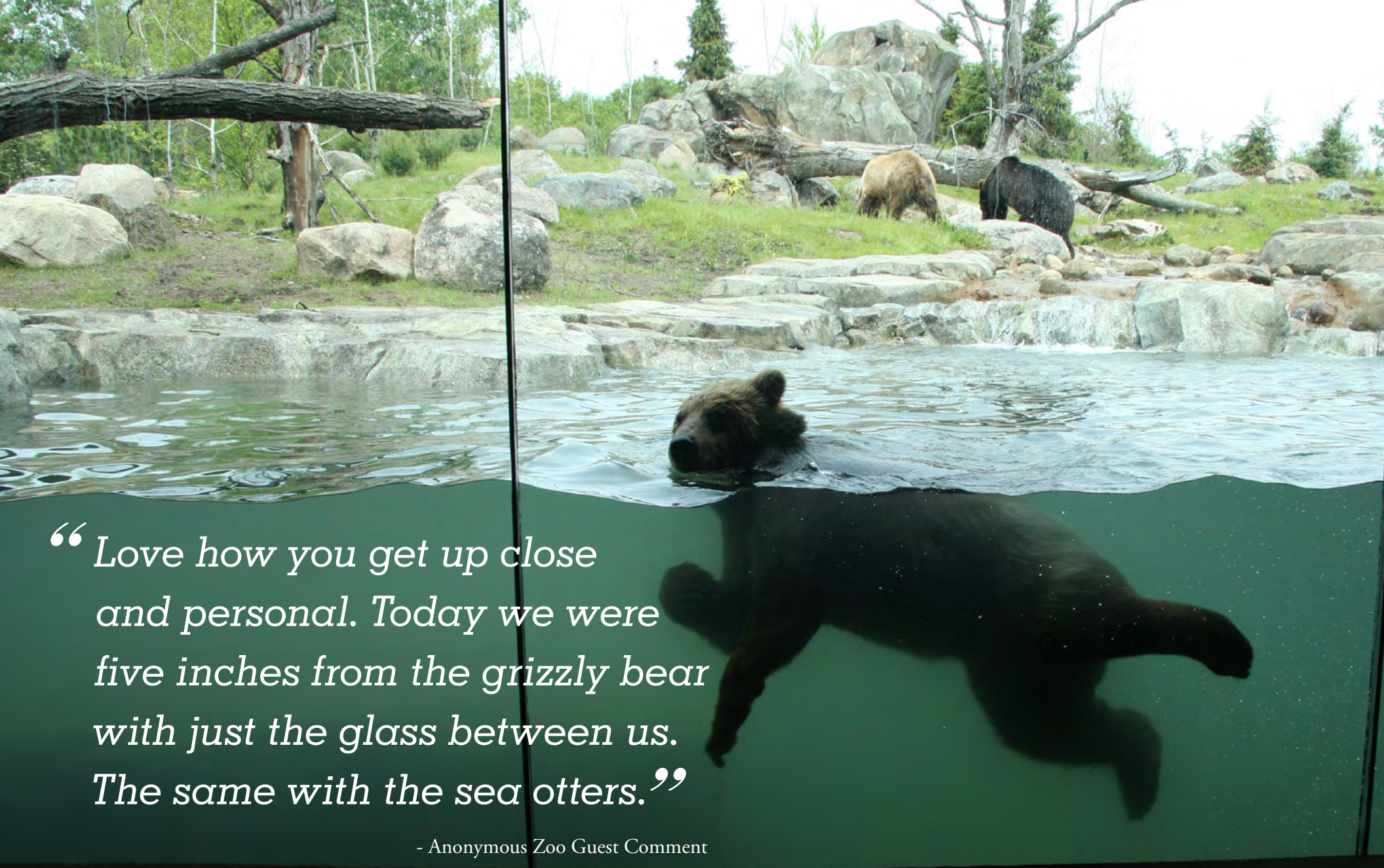
Berberis koreana
Chamaedaphne calyculata
Hydrangea anomala-petolaris
Hydrangea paniculata "Tardiva"
Lonicera chrysantha
Microbiota decussate
Philadelphus x Blizzard
Rhododendron 'Ramapo'
Rhododendron schlippenbachii
Spirea betuifolia 'Tor'

Korean Barberry
 Leatherleaf
 Climbing Hydrangea
 Tardive Hydrangea
 Honeysuckle
 Siberian Cypress
 Blizzard Mockorange
 Ramapo Rhododendron
 Royal Azalea
 Tor Spirea

Green Roof

Kamchatka Stonecrop
 Prairie Dropseed
 Heath Aster
 Big Leaf Aster
 Silky Aster
 Side Oats Gramma
 Blue Gramma
 Prairie Smoke
 Spiderwort
 Large-Flowered Beard Tongue
 Swamp Milkweed
 Boneset

Bottle Gentian
 Southern Blue Flag
 Great Blue Lobelia
 Monkey Flower
 Mountain Mint
 Finged Brome
 Porcupine Sedge
 Common Hop Sedge
 Common Fox Sedge
 Virginia Wild Rye
 Manna Grass
 Common Rush



“Love how you get up close and personal. Today we were five inches from the grizzly bear with just the glass between us. The same with the sea otters.”

- Anonymous Zoo Guest Comment

Applicant/Submitter

Section

B

Section B - Applicant/Submitter

Institution Name

Minnesota Zoological Garden ("Minnesota Zoo")
www.mnzoo.org

Address

13000 Zoo Boulevard
Apple Valley, MN 55124

Name of Director

Lee Ehmke

Signature of Director



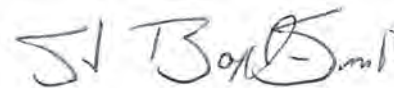
Submitter

Steve Boyd-Smith

Title

Interpretive Projects Developer
steve.boyd-smith@state.mn.us

Signature:



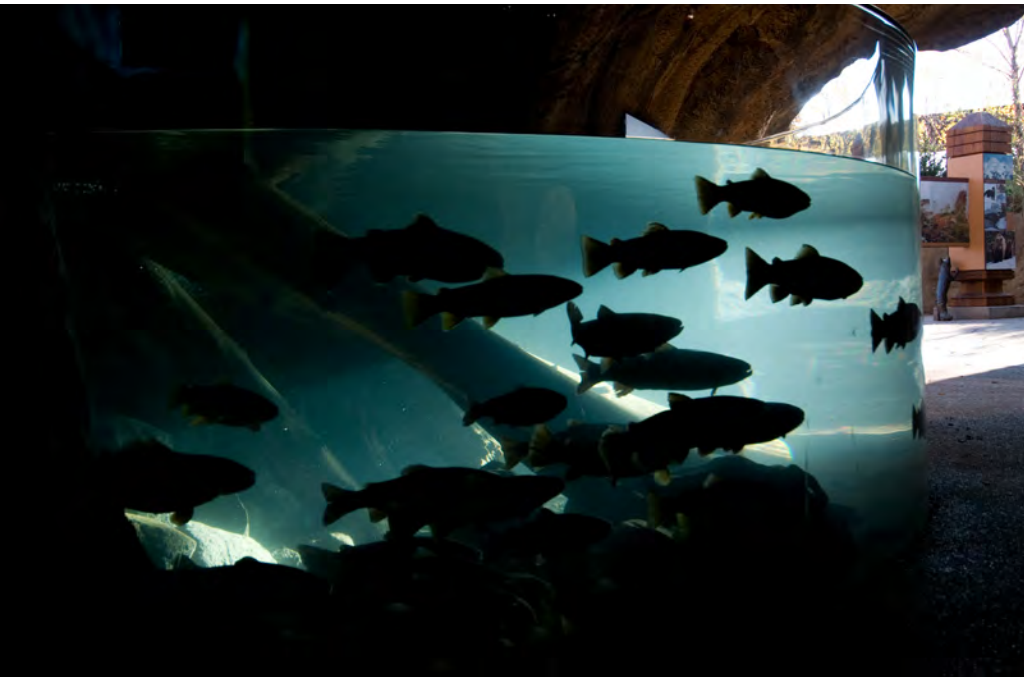
Date

April 30, 2009

Winner's Release

If yours is the winning application, would you be willing to have it posted on the AZA website?

Yes.



August 23, 2006



June 14, 2007



October 18, 2007



July 13, 2008



Construction Information

Click to view a time-lapse video of construction at mnzoo.org/grizzly/timelapse.html

Section



Section C - Construction Information

Date of official public opening

June 7, 2008

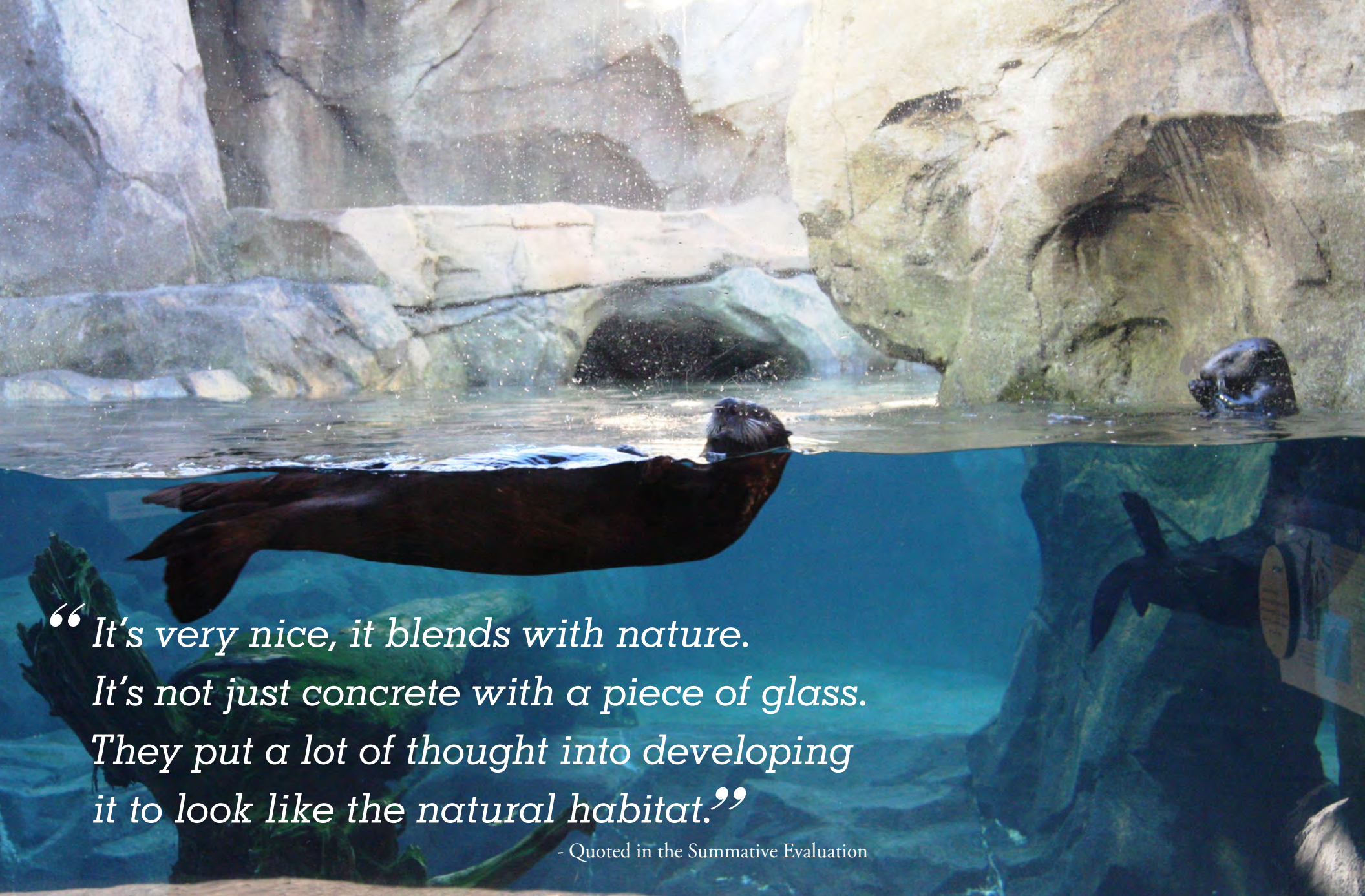
Total length of construction time (excluding planning stage)

24 months

Total cost of project

Design	\$3,166,439
Construction	\$24,002,359
Interpretation	\$891,482
Other	\$1,506,025
Total	\$29,566,305





*“It’s very nice, it blends with nature.
It’s not just concrete with a piece of glass.
They put a lot of thought into developing
it to look like the natural habitat.”*

- Quoted in the Summative Evaluation

Narrative

Section



1. Project Planning Process and Goals

Conceptual Development Process: The area now known as *Russia's Grizzly Coast (RGC)* began in the 2001 Master Plan as an "Asia Trail Gateway," serving as an introduction to the existing Northern Trail. The initial concept demonstrated the organizing principles of the Master Plan in a strategic location with a series of small exhibits. This was reconsidered in 2003 and a more daring "blockbuster" approach was selected as a means to revitalize the Zoo. Thus was born *Russia's Grizzly Coast*, creating an introduction to our outdoor trail exhibits and developing a powerful multi-species exhibit near the center of the Zoo. The Master Plan's Central Plaza redevelopment was added to this project as a critically-needed upgrade to the main guest amenities for the outdoor exhibits. The result is a fundamental transformation of the Zoo's exhibit style, the public's perception of the Zoo, and the ways our guests use the Zoo.

Mission and Master Plan: *Russia's Grizzly Coast* embodies the Zoo's Mission to "Connect People, Animals, and the Natural World" on several levels. The new exhibit and Central Plaza are the keystone of our Master Plan, generating momentum for future projects by demonstrating our value to the community and the viability of our Mission. Placing the animals within a spectacular naturalistic setting demonstrates to guests the interconnectedness of the animals and their wild homes. Elements in the settings remind us of long-standing human relationships with the animals. Our guests feel a strong connection with the animals through close-up viewing. And the exhibit has helped the Zoo make a solid commitment to *in situ* conservation for sea otters, Amur leopards, Amur tigers, brown bears, and other animals and habitats in the Russian Far East.

Interpretive Message and Goals:

The exhibit opens with this bold message:

The Russian Far East is one of the earth's last great areas of true wilderness. Along its extreme 6,000-mile coast, the range of giant brown bears overlaps with that of sea otters, wild boars, Amur leopards, Amur tigers, and many other equally wondrous species. You've never seen any place like this before.

Meeting that high bar required a multi-faceted experience design. The starting point is the faithful recreation of natural landscape features and the animals' interaction with this environment. Layered on that are stunning art-quality images, artifacts, touchable bronze sculptures, amazing stories, and personal contact with staff and volunteers. This program builds from the project's Goals and Objectives, summarized as:

1. Increase the positive impressions of the Zoo among members, new guests, and the general public.
2. Raise awareness of the Russian Far East and encourage a sense of value and care for the animals that live there.
3. Demonstrate the connection between animals and habitats.
4. Raise awareness of the threats facing these animals and the Russian Far East, connect those to parallel threats here in Minnesota, and give opportunities to take action.

Based on data, including a summative evaluation and guest numbers through summer and winter, we can confidently state that *Russia's Grizzly Coast* meets all of these objectives.

2. Physical Description

Guest Side: *Russia's Grizzly Coast* encompasses three unique biomes within the Russian Far East, defined as "Pacific Coast," "Volcanic North," and "Forested South." Throughout the experience,

guests are immersed in this dynamic place, complete with active geology, developing plant life, engaging animals, and the cycles of the seasons. Nowhere else can people experience this dramatic and important land halfway around the world.

Before people can learn, they need to be prepared and ready. The Central Plaza serves this purpose. Located at the juncture of the Zoo's main exterior trails and the entry to *RGC*, the Central Plaza provides orientation, play, rest, food, and restrooms within an animal and habitat-themed environment. These elements have positively affected visitor flow throughout the Zoo by creating a hub of activity.

Evergreen forest-covered coastal cliffs form the southern edge of the Plaza and serve as the gateway to *RGC*. A towering rock spire supports the exhibit title, a region map, and the central welcoming statement described above, a unit that together establishes the scene. Guests then descend between coastal rock formations, drawn by the sounds of waves and coastal birds, into sea caves and the "Pacific Coast" zone.

Guests pass whale bones among water-eroded cliffs to find a split-level view of the sea otter habitat. Stadium seating invites guests to linger, taking in the otters' playful activity, perhaps catching an interpreted enrichment session, interacting with Zoo staff or volunteers, or even catching a glimpse of a brown bear beyond.

Emerging from the coast, guests head inland to the "Volcanic North" of Kamchatka. A transition zone introduces them to this new place with steam vents and a bubbling mud pot, a deep rumbling, and peeks to Bear Meadow. Rounding a bend,

they enter the main bear view: an eroded lava tube. Here guests gain a stunning 26-foot wide panorama above and below water of the bears in a natural meadow that seems to go on forever. Bears fish and play in the water against the glass, investigate the geyser, tussle and climb trees, or take a break in the cutaway den, all to the delight of the Zoo's largest-ever crowds.

Transitioning out of this zone, guests enter a wide spot with restrooms, a covered bear enrichment demonstration area with more views into the bear meadow, and a popular mammoth dig/sand pit play area. This small zone provides a nice rest and transition for the remainder of the exhibit.

From here guests enter the "Forested South" zone. A family of wild boars can be viewed from several vantages including inside an authentic Russian log cabin. The dense woods are also home to two of the world's largest and most endangered cats: the Amur leopard and the Amur tiger. The Amur region is at the same latitude as Minnesota, so these large felines are right at home in the snow and cold of Minnesota's winter.

Behind-the-Scenes: To make all of this work on the guest side, *RGC* added six hidden buildings, a substantial moat, new service roads, gates, and extensive fencing. The new buildings include Life Support, a new "green" Education Event Center, and four dedicated to animal holding. In total, *RGC* encompasses 3.2 acres, with 20,300 ft² (14.7%) developed to animal exhibit spaces, 4,460 (3.2%) for off-exhibit holding, 4,190 (3%) for kitchens and keeper space, 54,000 (39.1%) as non-exhibit landscape, 21,440 (15.5%) for the visitor zone, and 4,500 (3.3%) for mechanicals. Central Plaza covers another 1.85 acres, 97.9% of which is public space.

3. Interpretive Program

As guests travel through the three ecological zones of *RGC*, interpretive elements help make sense of what they see and discover. Each of the three zones includes two dominant elements that help guests know where they are in the Russian Far East. "Gateways" introduce the habitat and the animals within it. "Columns" are large winged structures that serve as gorgeous photo albums and put the exhibit habitats within a larger context.

At each animal viewing area we introduce another series of repeating elements: ID Panels, Adaptations Panels, Status Panels, Zoo at Work circles, and Cool Fact circles. These are aimed at providing easy access to information that guests want and return their focus to the exhibit's affective and cognitive goals without intruding on the immersion experience of the environments themselves.

Inside the Russian cabin guests dig deeper into the conservation stories. Here we focus on three causes of decline of the region's species (Loss of Habitat, Loss of Prey, and Poaching) then broaden that to parallel stories here in Minnesota. We also talk about things people are doing to help. Here we have developed a vocabulary of key words that are now spreading to other exhibits around the Zoo: "Learn," "Save," "Involve," and "Restore." A unique "Make A Difference" activity ties threats and actions together by encouraging guests to make choices and donate to conservation of a selected species.

Interpretive planning did not stop at the static exhibitry but integrated our strong volunteer corps, the interpretive monorail that travels above the exhibit, and the presence of staff on the Trail. Development of written study guides and "bench talk" programs and training of all volunteers and staff were central to the interpretive plan.

4. Safety

Each species' holding area is divided into two main areas: entry vestibules/service corridors, and the animal containment area. Only animal management staff has access to the containment area. Education, operations, and utility staff have access to the entry vestibule/service corridor areas for tours and maintenance purposes. Entry into these multi-use spaces is controlled by a customizable electronic key fob.

The dangerous carnivore holding areas (bear and leopard) have additional safety measures. Lighted "Staff In Exhibit" panels have been installed in strategic locations in both holding areas. All animal containment doors have repetitive latching mechanisms to provide additional door strength and security. Network video cameras in each holding area have a 24-hour playback mode to review animal incidents or a potential security breach.

Emergency firearm protection has been planned into each dangerous animal area. An additional gun safe was installed in the leopard holding building to provide the Zoo's firearms team a readily accessible weapon location in the bear/leopard general area. Shooting port windows have been designed into the doorways leading from the service corridors into the animal containment areas.

5. Conservation

Conservation is the heart and soul of *Russia's Grizzly Coast*, both on-site and *in situ*. From green building principles to the education goals for our visitors, conservation was woven in from the very beginning. The Zoo manages its animal collection with an eye towards the benefit of the species, and as a result of this exhibit, the Zoo has expanded on our long-standing leadership with tiger conservation to active involvement with Amur leopards and other species and habitats in the Russian Far East.

Construction: The project was designed with an eye towards the Minnesota Sustainable Building Guidelines, plus LEED for the Education Event Center. This meant incorporation of some simple practices ranging from recycling of waste (61% overall) and reuse of trees and boulders salvaged from the site to drilling wells for geothermal energy. Green roofs are used on 1/3 of the flat roofed buildings—a fact we interpret on our monorail as it passes over. (A list of green construction practices is attached as Appendix 2.)

Amur Leopards: The Zoo's commitment to wildlife conservation is most clearly demonstrated through a case study of the Amur leopards.

During planning for the exhibit, the Minnesota Zoo's Conservation Director, Dr. Ron Tilson, visited the Russian Far East. During the trip, he met with key players in the Amur Leopard and Tiger Alliance (ALTA), viewed ALTA's field programs, and visited the site of a planned Amur leopard reintroduction. This visit informed the interpretive content of *RGC* and helped the Zoo become a key player in Amur leopard conservation.

Since that visit, the Minnesota Zoo has directly donated \$40,000 to ALTA's programs. We also solicit donations for ALTA programs from other Amur leopard institutions in North America and from Minnesota Zoo guests. We have distributed an additional \$31,000+ from this Amur Leopard Field Conservation Fund. Furthermore, the Minnesota Zoo's Ulysses S. Seal Conservation Grant Program has supplied additional funding for *in situ* research.

The Minnesota Zoo also became an important player in the *ex situ* conservation of Amur leopards. In 2006, the Zoo became the PMP (now SSP) coordinator for Amur leopards. Because new geneti-

cally valuable founders are needed to augment the population, the Minnesota Zoo recently imported a female Amur leopard from France and is in the process of importing a male from the Czech Republic. The Minnesota Zoo will attempt to breed this pair in an effort to produce genetically valuable cubs that may be eventual candidates for a potential reintroduction in the Russian Far East.

On the public education side, the Zoo's exhibits, classes, and programs raise awareness and funds. We have also adapted a Russian celebration of Amur leopards and tigers for Zoo guests. In July 2008, the Minnesota Zoo held its first annual Amur Leopard Festival, with leopard face painting, animal art displays, games, keeper talks, music, and a parade. 17,807 people attended this two-day event.

Other Species: Through the development of this exhibit, the Zoo has grown its involvement in various *in situ* conservation programs related to the animals and places represented. These include grants for research on northern sea otter populations, brown bear research in Yellowstone and Kamchatka, and research in the Russian Far East for species that are not even represented in the exhibit: cranes and Blakiston's fish owls.

6. Animal Husbandry and Management

The animal husbandry goals of *RGC* are to create realistic, engaging, and safe animal environments that replicate their wild habitats and stimulate natural behaviors for the health of the animal collection and education of the viewing public. All exhibit and holding areas were built to meet or exceed animal husbandry needs and current industry and regulatory standards. Keeper feedback and satisfaction during this first year of operation has been high.

Sea Otter: The sea otter exhibit and holding areas were designed to manage up to three groups of northern sea otters. The 33,000-gallon exhibit pool varies from six to 10 feet deep and features an irregular shoreline that encompasses three separate bays. Three separate six-foot deep indoor holding pools average 1,100 gallons each.

The exhibit pool's plunge holes, logs, and rock columns provide a naturalistic and stimulating environment for the sea otters. The 572 ft² beach area serves as a dry resting spot for the otters and a training/demonstration area for the keepers to interpret the animals to guests.

The aquatic system recirculates salt water and maintains the temperature at approximately 55° F. Critical utility and flow parameters are monitored 24 hours/day by the Zoo's main alarm system.

The sea otters are managed on exhibit during visitor hours and shifted into the holding pools at night. The otters are fed five times a day and typically one trainer is dedicated to each animal for the feeding/training sessions.

The sea otters at the Zoo were wild orphans and are on permanent loan from the USFWS which prohibits their breeding.

Brown Bear: The main brown bear exhibit view simulates the rugged habitat of the Kamchatka peninsula, but because these bears range throughout all three zones depicted, they can at times be viewed from other zones and seem to belong. The exhibit encompasses 11,250 ft² of a gently sloping grassy meadow, bisected by a recirculating trout stream and pool. Three steam vents and one intermittent geyser within the animal exhibit highlight the region's volcanic characteristics.

The multi-level, 20,000 gallon stream and pool provides the bears with opportunities for lounging, wading, and diving for the stocked trout. A separate 2,000 gallon trout holding pool is located within the main visitor viewing area. A heated den adjacent to the pool was popular with bears and guests this winter.

A prominent rock outcropping at the back of the exhibit serves as a climbing structure and sentry point for the bears. Dubbed “bear rock,” it also masks the bear shift corridor into holding. Five heated rock features are strategically placed near the pool and on bear rock. A 14 ft. deep x 12 ft. wide dry moat surrounds three sides of the exhibit for animal containment, with heavy equipment access for snow removal and maintenance.

The bear holding area was designed to comfortably contain three large brown bears. Three 180 ft² holding cages are adjacent to an 1,100 ft² outdoor, covered holding yard. This yard includes a digging pit, pool, and self-activating shower. Keepers can enable custom-designed “slap” doors during cold months, allowing the bears to move freely in and out of the yard without leaving doors open on cold nights. An in-floor hydronic heating system keeps the holding area above freezing in winter months.

The bears are shifted twice daily through a covered mesh corridor that connects the holding building and the exhibit. A restraint cage section has been custom built within this corridor for routine medical, training, and weight monitoring procedures.

The three bears were obtained as wild orphans. They are on permanent loan from Alaska Fish and Game which prohibits their breeding.

Wild Boar: The wild boar exhibit simulates a dry

stream bed in a Russian forest. A gently sloping pool serves as one of the front viewing containment barriers and allows the animals to cool off in the summer heat.

Wild boar holding consists of three 110 ft² holding pens. Fans and large ventilation panels help keep the holding area cool in summer.

Because the AZA Pigs and Peccaries TAG does not recommend this species for genetic management, the male boar have been reproductively neutered.

Amur Leopard: The Amur leopard exhibit was designed to flexibly manage multiple animals on display at any one time. Two meshed enclosures measure approximately 1150 ft² each and can be opened up via shift doors to become one large enclosure. A separate glass-fronted maternity exhibit measures 500 ft². The entire zone is almost twenty feet high and enclosed with three inch cable mesh, supported with center metal poles that also incorporate natural tree deadfalls on which the cats climb and lounge.

The leopard holding area was designed to contribute towards the long-term management and breeding of this rare species. Four holding cages are connected to the exhibits via a network of shift tubes. Animals are shifted daily between the exhibits and holding area. Two 150 ft² outdoor enclosures adjoin the holding area for use when cats cannot be on display. A custom restraint cage can be mounted in several locations between the holding cages for routine medical, training, or weight monitoring procedures.

The Minnesota Zoo manages the Amur leopard SSP for distribution to other AZA zoos and potential future reintroduction efforts in Russia.

7. Visitor Experience and Impact

Russia's Grizzly Coast is a huge hit with guests and the media. Zoo attendance and memberships have exceeded our aggressive projections, with gate income up 53% from the previous year through February, even through an economic downturn and a cold winter. Retail income is also up 42% and food up 27%.

A formal summative evaluation (see Appendix I) demonstrates that the effect of *RGC* goes deeper than attendance to the project's affective and cognitive goals. Comparing visitors before the press blitz and after opening, the evaluation documented:

- A stunning 96% of guests would recommend *Russia's Grizzly Coast* to their colleagues.
- Post-visit guests were able to describe animal characteristics in detail. More critically, post-visit guests' descriptions are very likely to mention the animal in relation to its habitat, indicating that the connection with animals and the natural world that is a key part of our Mission is taking place.
- Comments from post-visit guests include significant amounts of content and vocabulary that matches the exhibition labels. Guests are reading the labels and are quick to integrate that information into their experience.

Furthermore, the “Make A Difference” interactive, through which guests vote with their dollars to support conservation programs for their choice of three species, had collected \$13,000 by mid-March (after 9 months, including winter). This demonstrates thoughtfulness and caring, two of our deepest goals.



“ One of the reasons I love zoo design is that the animals are our clients as well. We need to anticipate their actions, provide for their needs, and provide for them to choose to do what they want naturally. ”

- lead designer Keith McClintock of The Portico Group

Illustrative Materials

Section



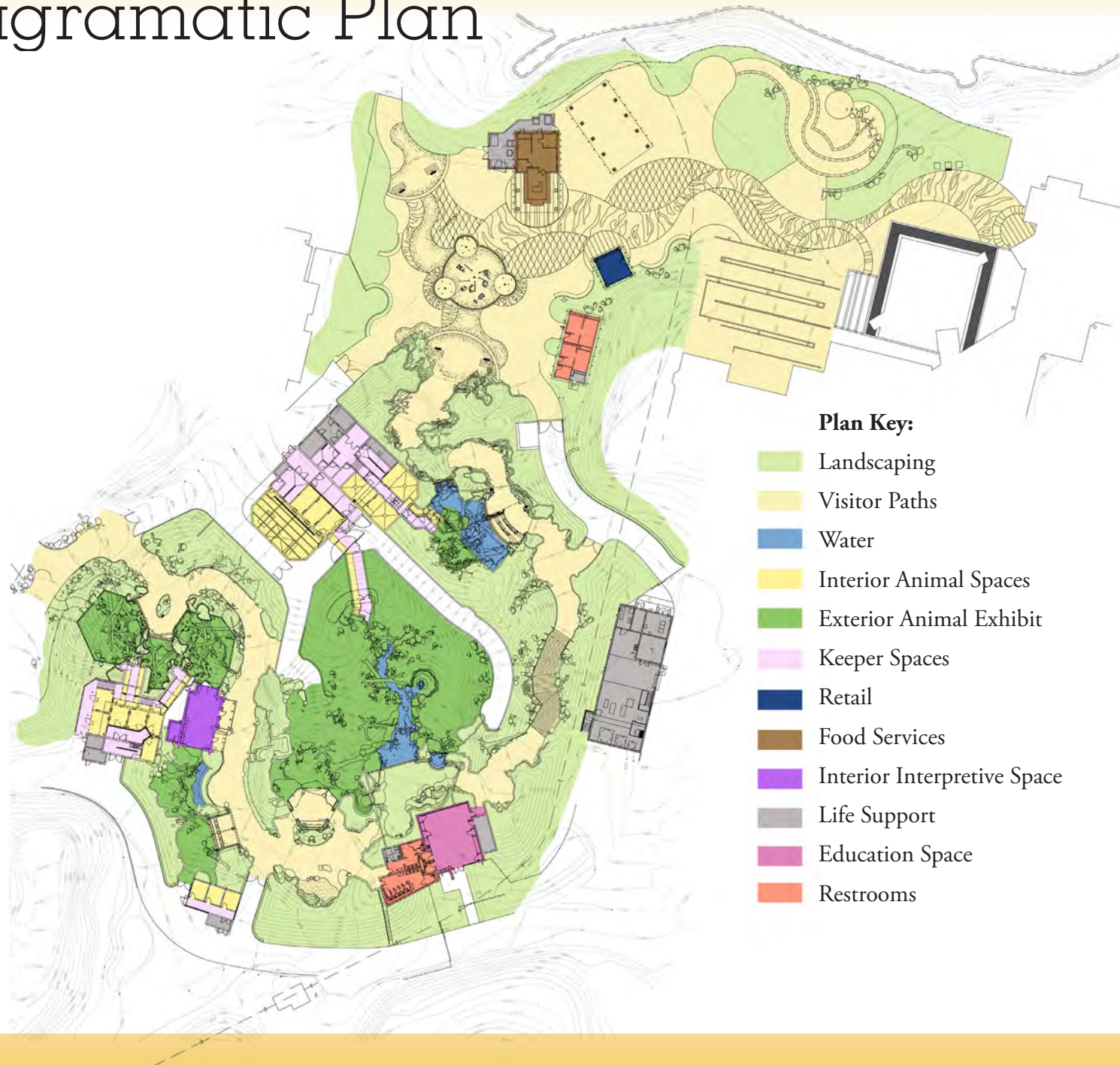
Illustrative Plan



Central Plaza

Russia's Grizzly Coast

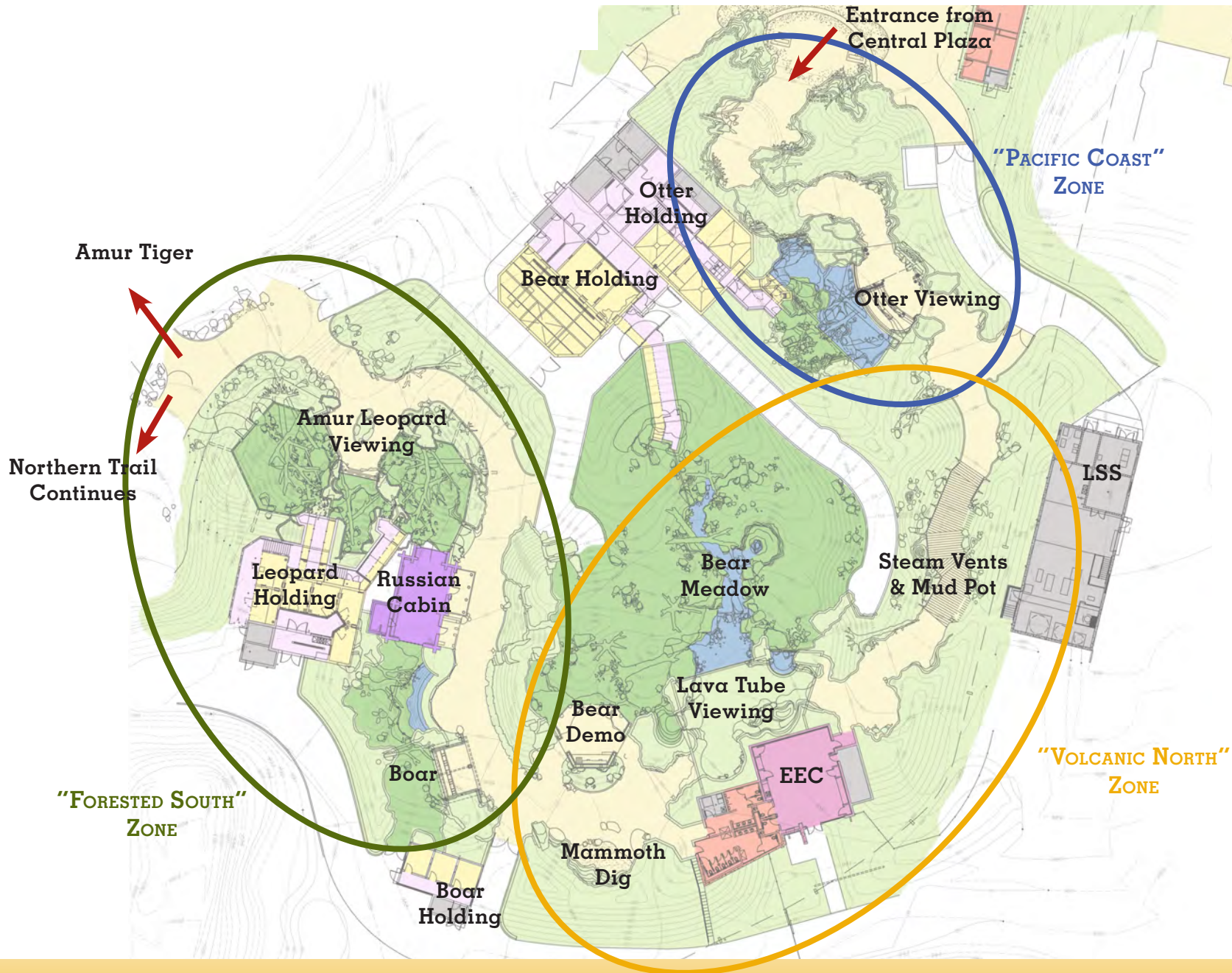
Diagrammatic Plan



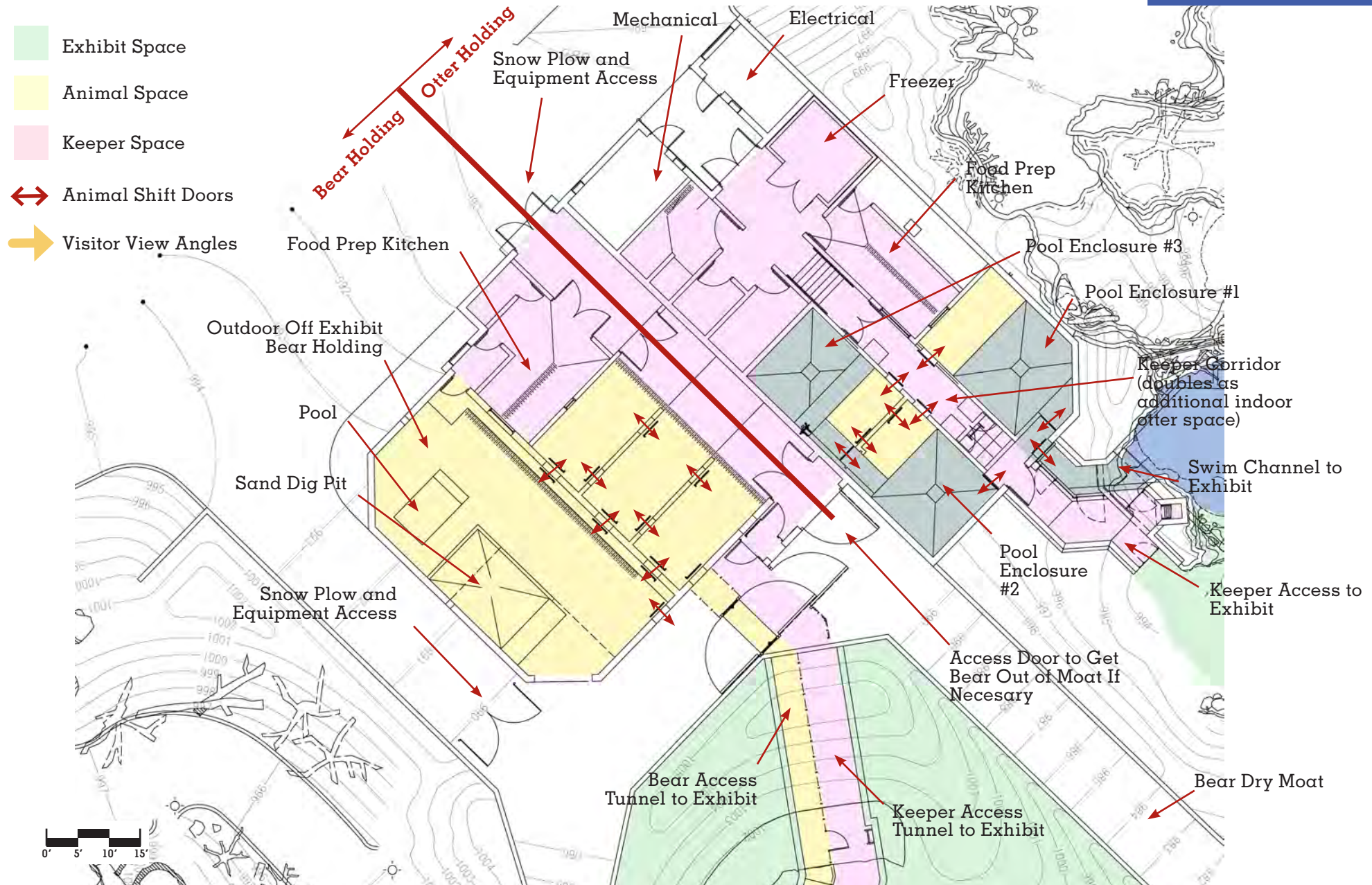
Central Plaza Plan



Russia's Grizzly Coast Plan

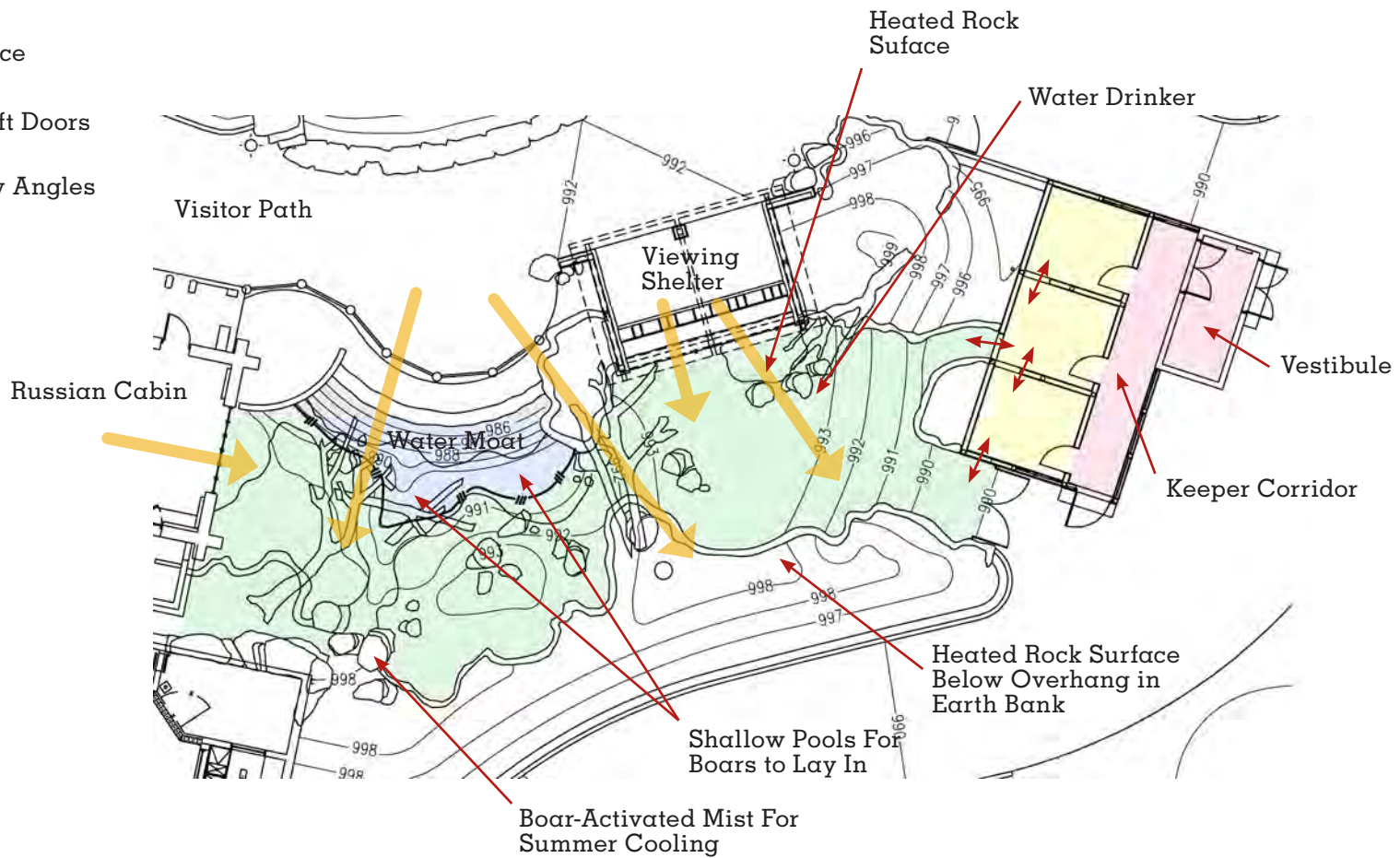


Bear/Otter Holding Plan

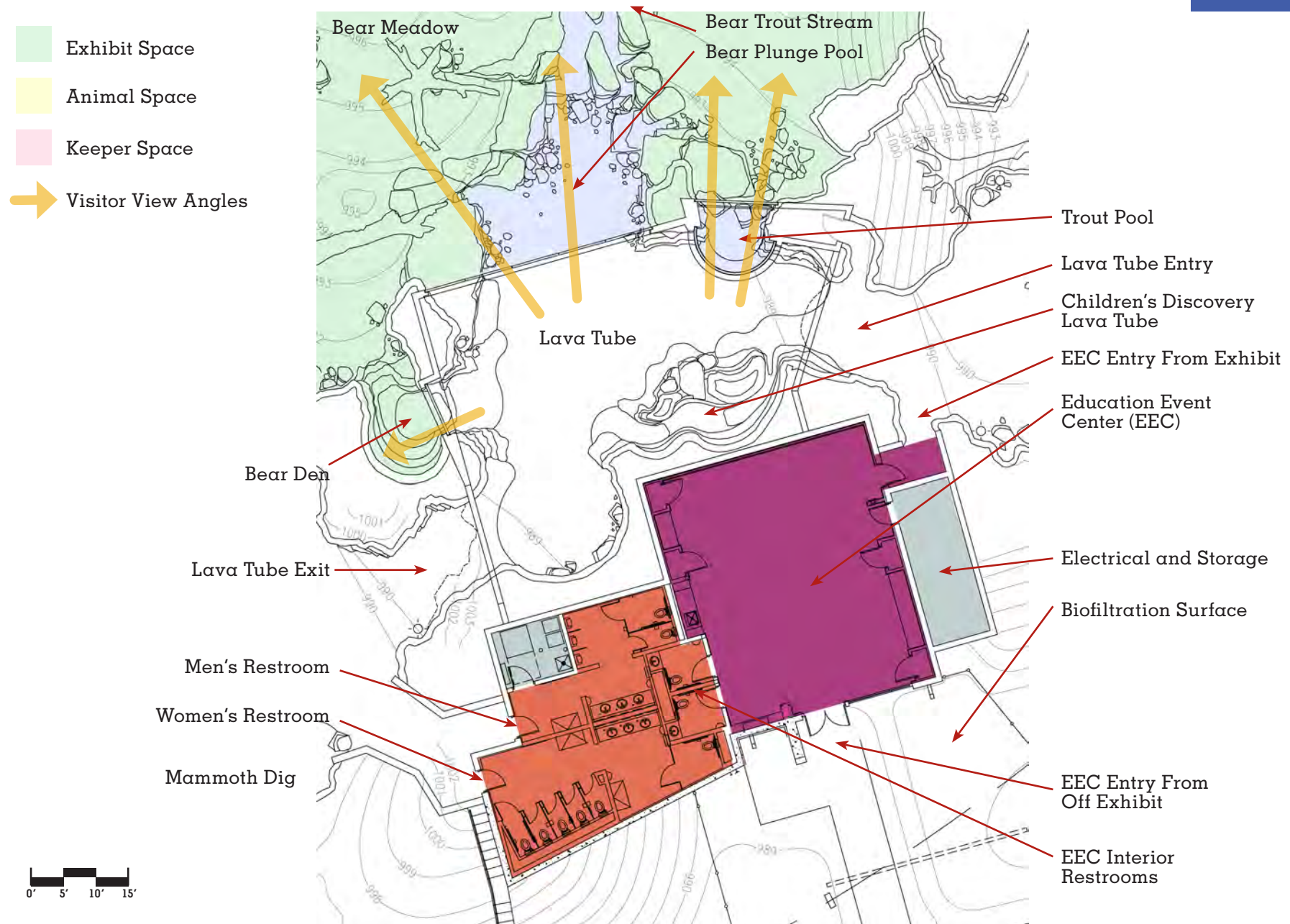


Boar Holding Plan

- Exhibit Space
- Animal Space
- Keeper Space
- Animal Shift Doors
- Visitor View Angles



EEC/Lava Tube Plan

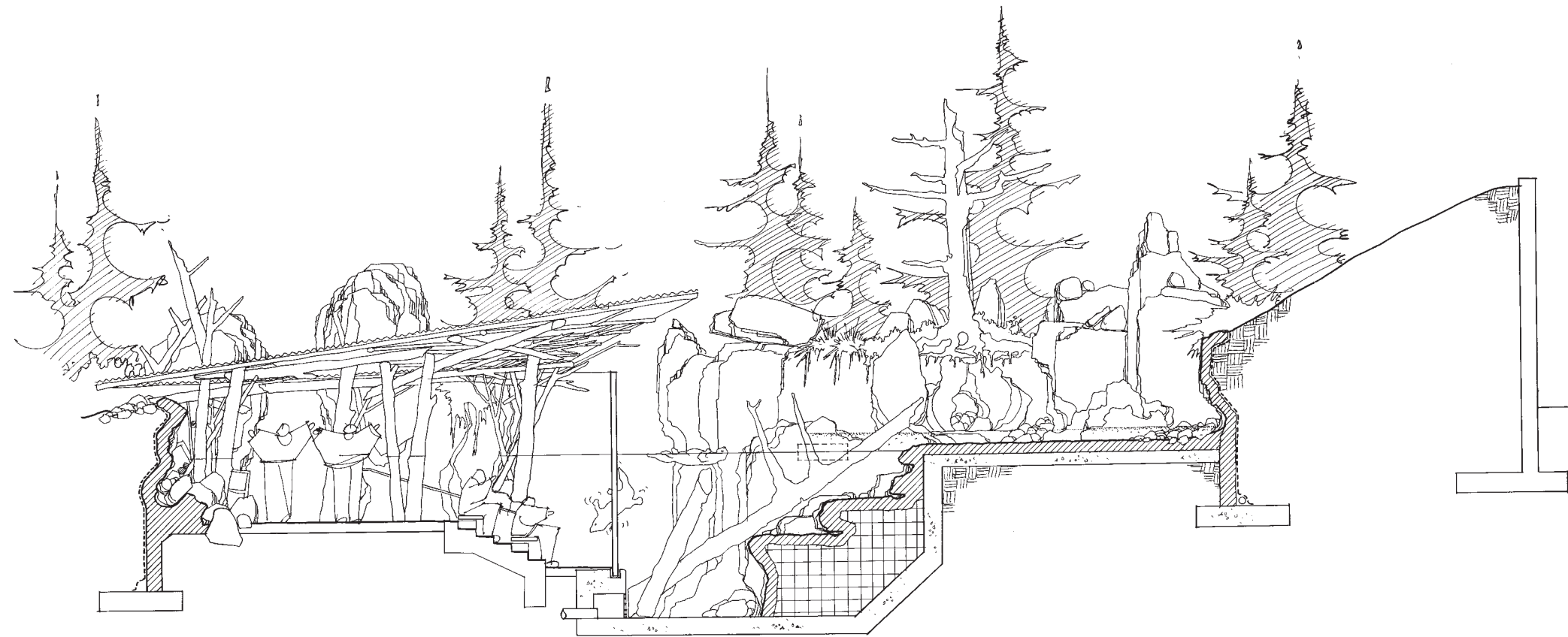


Leopard Holding Plan

- Exhibit Space
- Animal Space
- Keeper Space
- Animal Shift Doors
- Visitor View Angles



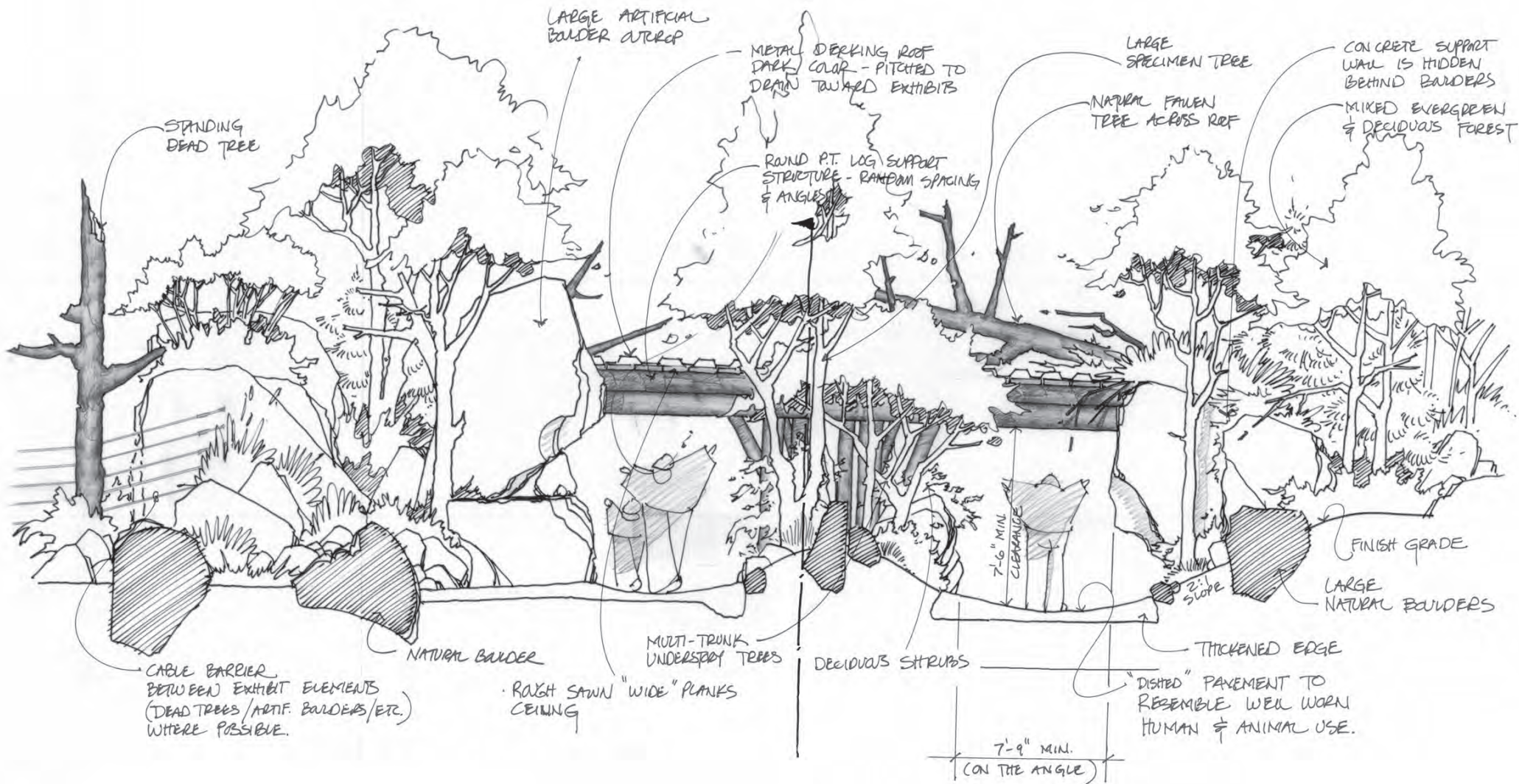
Section through Sea Otter



Section Through Lava Tube



Elevation at Leopard Viewing



Central Plaza



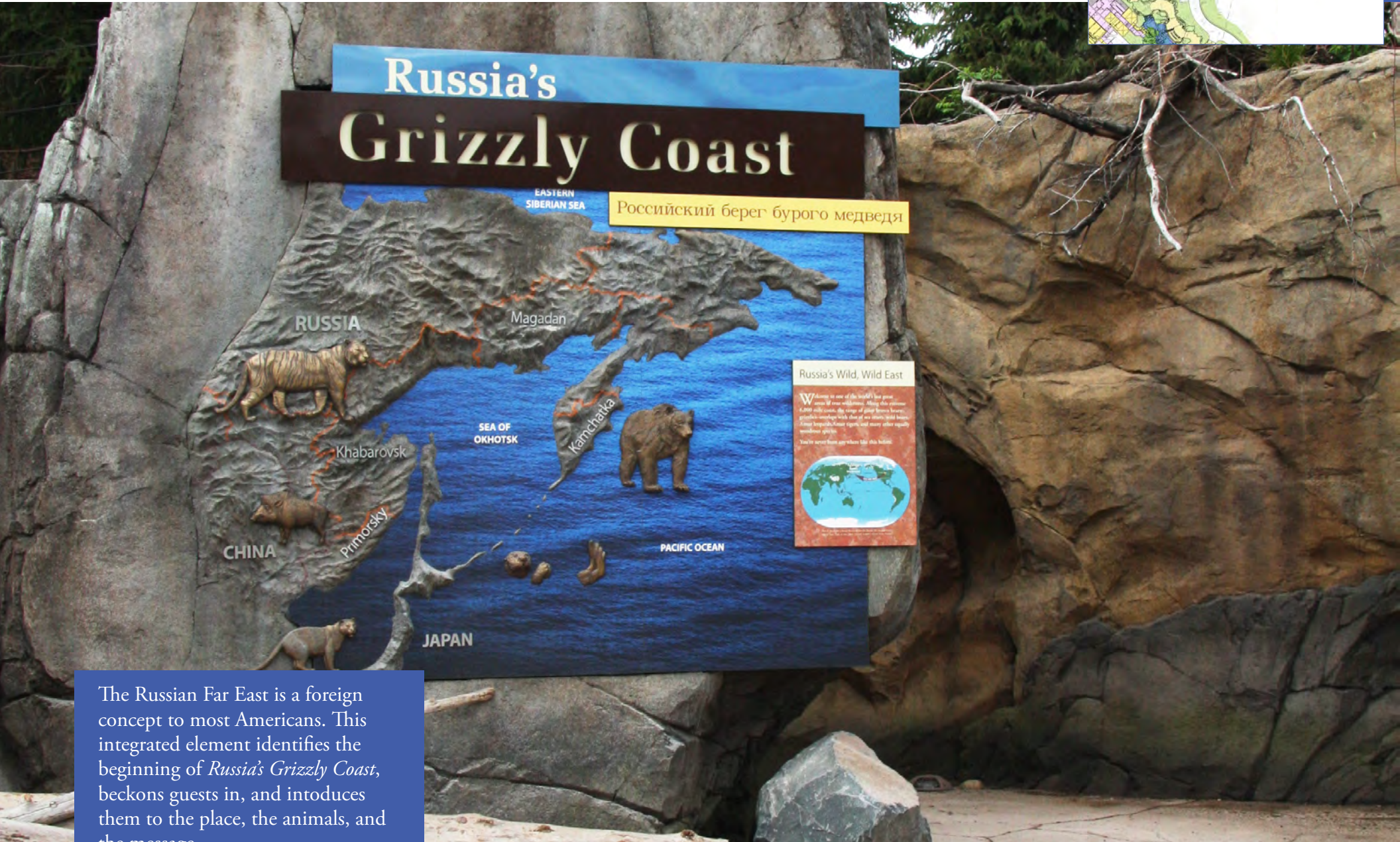
The guest's journey begins from the Zoo's main outdoor decision point: Central Plaza. With new food service (Russian-themed), retail, restrooms, wayfinding elements, amphitheater and a sculptural play fountain, this has become a new outdoor hub for the Zoo's many features.

Central Plaza to RGC



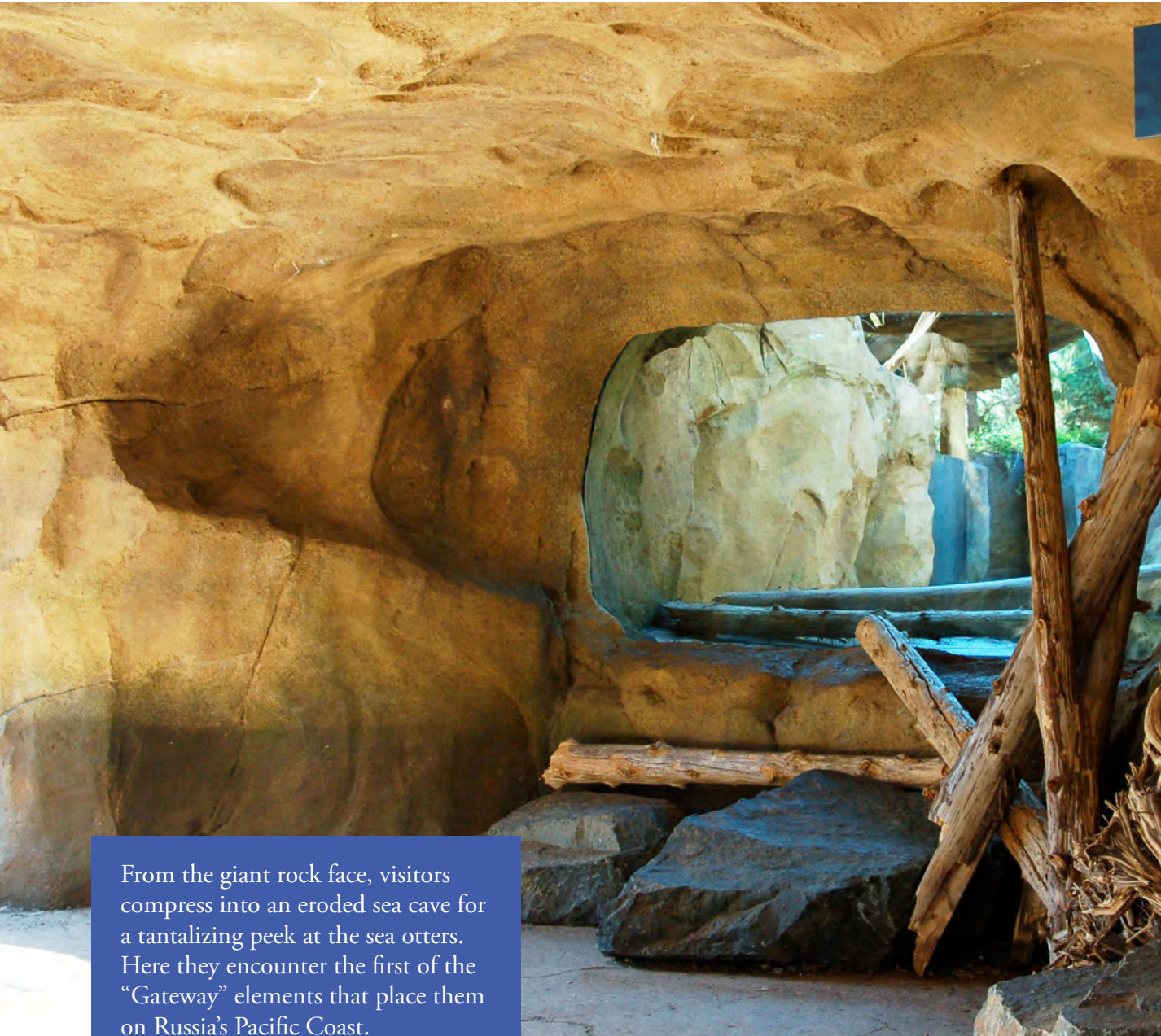
From the Central Plaza visitors' attention is drawn to *Russia's Grizzly Coast*. Amid landscaping and the sounds of Russia's Pacific Coast, they encounter a rock face from which emerges the title, a region map, and the central welcoming and introduction statement.

Central Plaza to RGC



The Russian Far East is a foreign concept to most Americans. This integrated element identifies the beginning of *Russia's Grizzly Coast*, beckons guests in, and introduces them to the place, the animals, and the message.

Pacific Coast Gateway



Russia's Grizzly Coast
Pacific Shore
Российский берег бурого медведя

What catches your eye, what makes you think, Russia's grizzly Pacific coast? About the land border of southern Alaska.

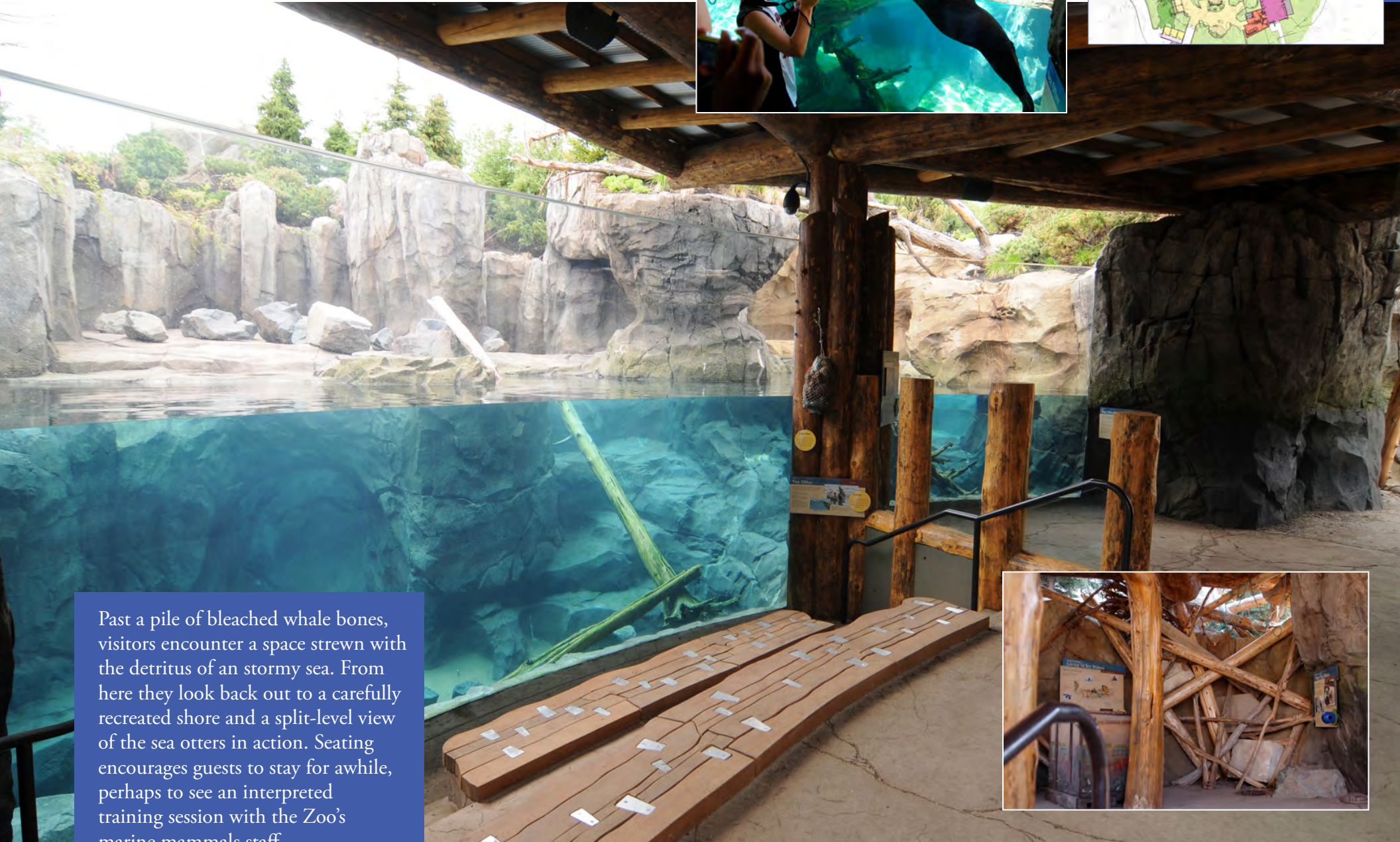
Islands and Coasts:
Cold, wet, and very rich

Sea otters thrive in the frigid waters along Russia's Pacific coast, among some of the world's richest fisheries and the highest seabird diversity in Asia. With a keen eye you might even spot a seafood-loving grizzly.

A circular map showing the Pacific Coast region of North America. A red star and the text "You Are Here" are placed on the coast of Alaska. The map is labeled with "AMERICAN OCEAN", "RUSSIA", "PACIFIC OCEAN", and "NORTH OCEAN".

From the giant rock face, visitors compress into an eroded sea cave for a tantalizing peek at the sea otters. Here they encounter the first of the "Gateway" elements that place them on Russia's Pacific Coast.

Sea Otter Viewing



Past a pile of bleached whale bones, visitors encounter a space strewn with the detritus of a stormy sea. From here they look back out to a carefully recreated shore and a split-level view of the sea otters in action. Seating encourages guests to stay for awhile, perhaps to see an interpreted training session with the Zoo's marine mammals staff.

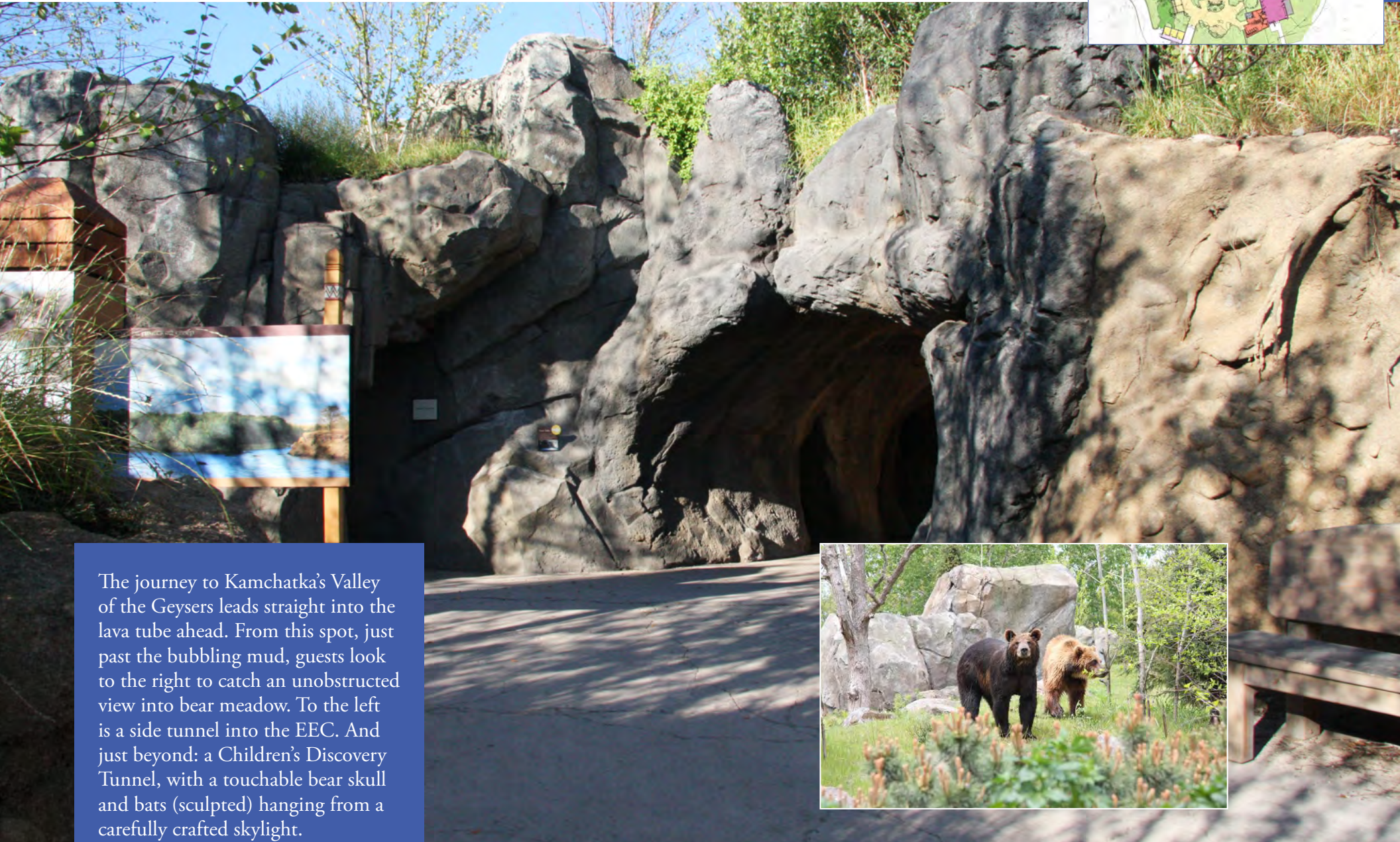


Transition Inland



Beyond otters, we move inland to the “Volcanic North.” A deep rumble, new bird sounds, vivid vegetation, steam rising from volcanic vents, a bubbling mud cauldron, a distant geyser, and occasional glimpses of bears engage and draw us forward.

Lava Tube Entrance



The journey to Kamchatka's Valley of the Geysers leads straight into the lava tube ahead. From this spot, just past the bubbling mud, guests look to the right to catch an unobstructed view into bear meadow. To the left is a side tunnel into the EEC. And just beyond: a Children's Discovery Tunnel, with a touchable bear skull and bats (sculpted) hanging from a carefully crafted skylight.

Column



Each of our three regions includes a Column unit. Like giant coffee-table books combined with original bronze sculptures and rough-hewn vernacular architecture, these unique elements provide big-picture context and little details that give depth to the places. To accomplish this, the Zoo partnered directly with Russian wildlife photographers.

Inside the Lava Tube



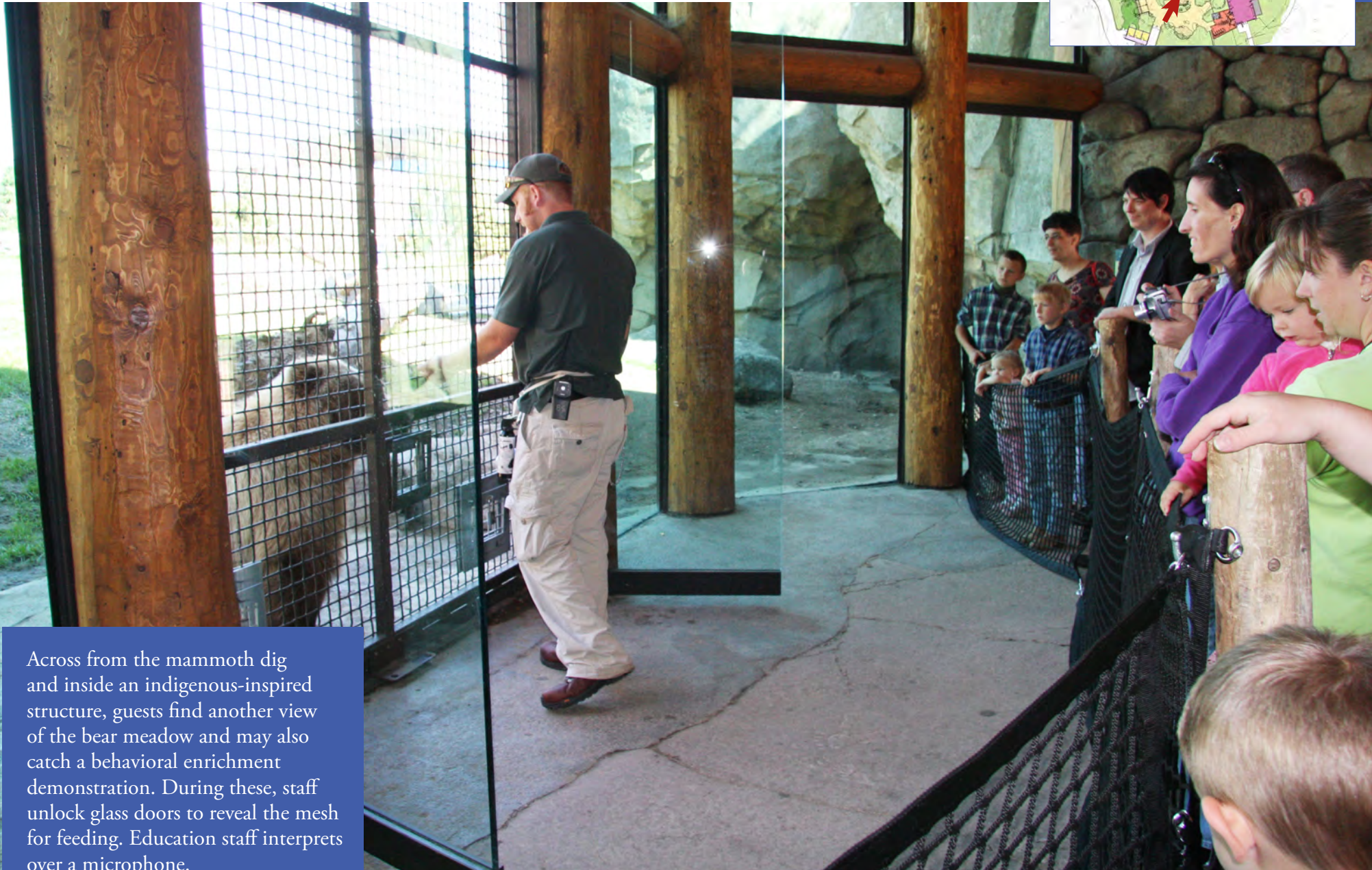
Inside the lava tube, visitors are treated to an above and below-water view of the playing bears. Receding behind is the stream that feeds the pool, a meadow, and a hill up to “bear rock.” The view seems to go on forever.

Mammoth Dig



Past the lava tube, guests often take the opportunity to dig for mammoth bones in the sand pit. Adults rest, watch, and learn about ice-age connections between this region of Russia and Minnesota. All have easy access to restrooms immediately to the left of this view.

Bear Behavior Station



Across from the mammoth dig and inside an indigenous-inspired structure, guests find another view of the bear meadow and may also catch a behavioral enrichment demonstration. During these, staff unlock glass doors to reveal the mesh for feeding. Education staff interprets over a microphone.

Forested South



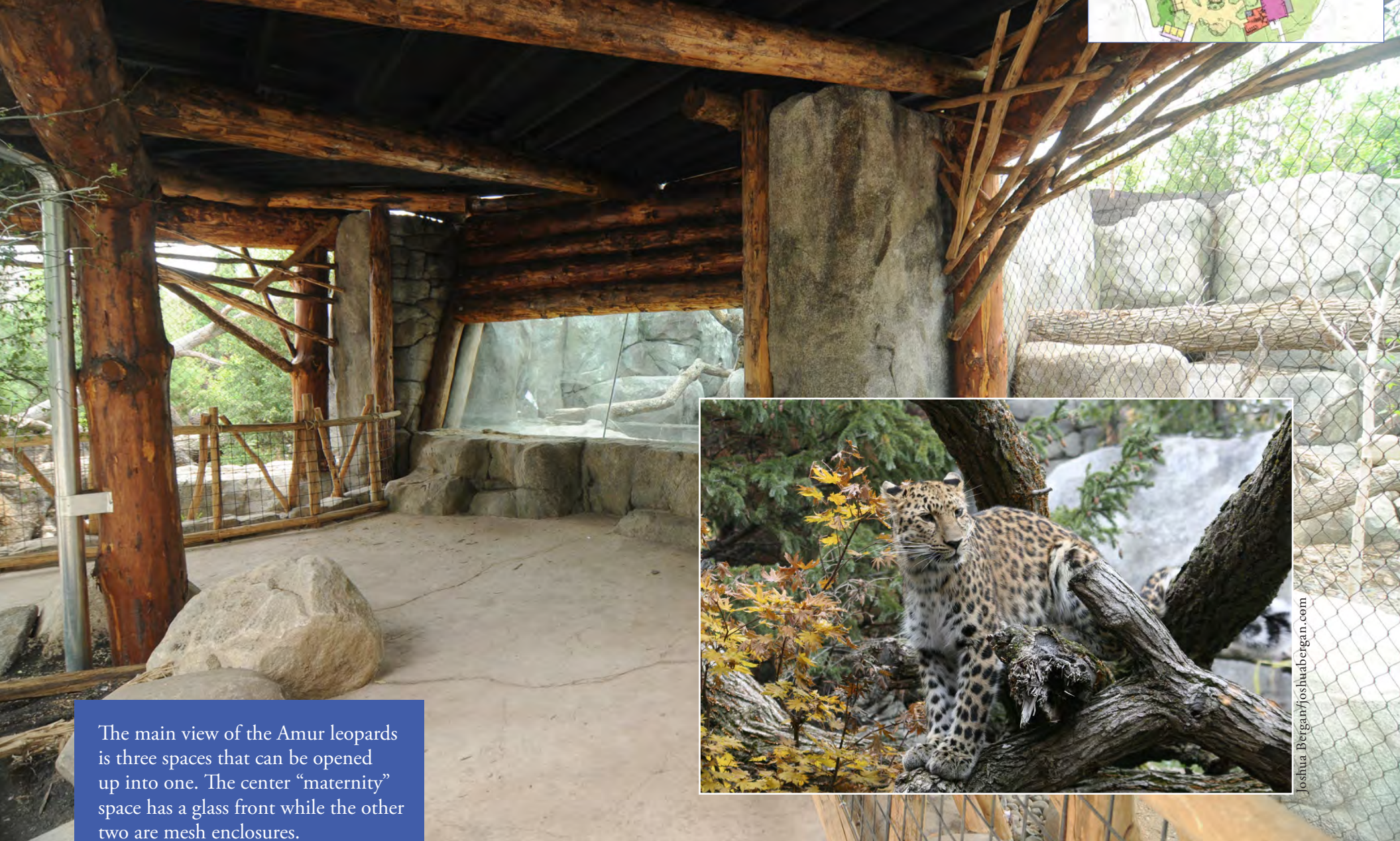
The third region in the exhibit is defined as “Forested South.” Straight across the 45° north latitude line from the Twin Cities, the woods here are remarkably similar to Minnesota’s. We begin to see more evidence of humans in this more populous region, culminating with an authentic Russian cabin that separates views of wild boars and Amur leopards.

Cabin Interior



This traditional log cabin was originally built in Russia. Inside, visitors find the perspectives of people who live in the region, a more in-depth discussion of the threats facing wildlife in Russia and Minnesota, and solutions that are being tried. Tying this together, guests may vote with their dollars for the conservation programs they want to support.

Leopard Exhibit



Joshua Bergan/joshuabergan.com

The main view of the Amur leopards is three spaces that can be opened up into one. The center “maternity” space has a glass front while the other two are mesh enclosures.

Amur Tiger Base Camp



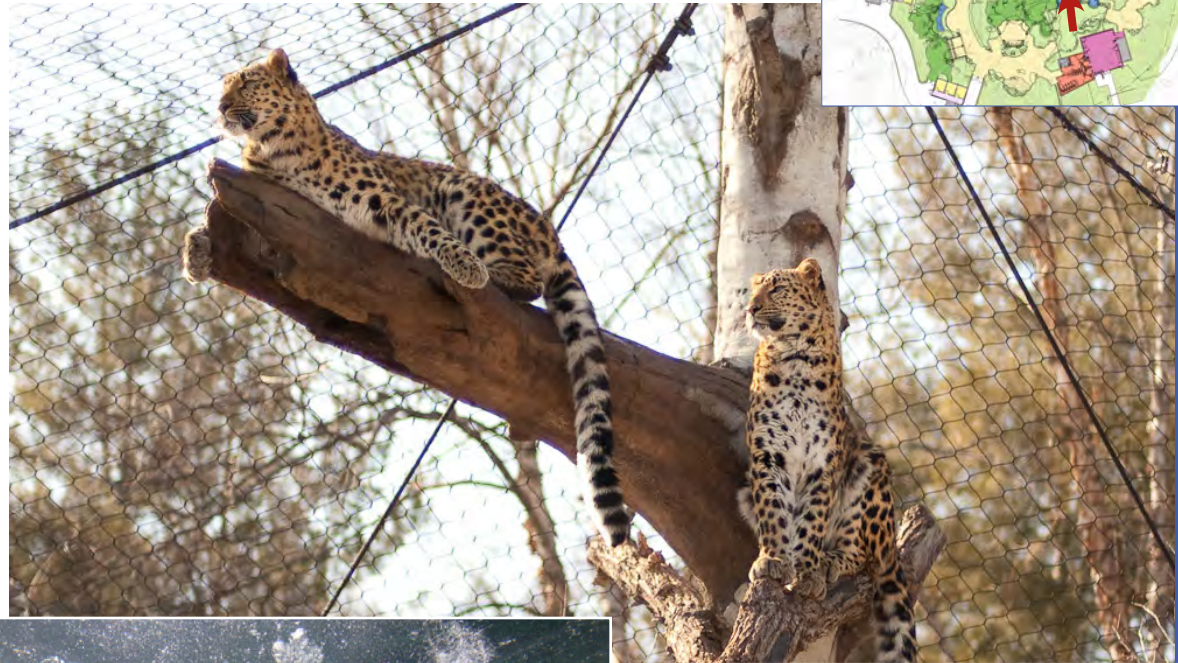
The exhibit ends at the pre-existing Amur Tiger Base Camp. Graphics were changed to match the styles and tone of RGC. This is the transition point between RGC and the rest of the Northern Trail. Over time, we expect to carry some elements from RGC through the Trail, including Gateways and the "Cool Fact" Circles.

An All-Season Exhibit



Minnesota and Russia's Far East share similar climates, to which the animals in the exhibit are well-adapted. *Russia's Grizzly Coast* therefore plays well even during the winter.

Built-in Enrichment



Colin Smith



Jenna Workman



Eric Hanson/Flickr

Whether climbing a deadfall tree, fishing, tussling amidst underwater deadfall, digging in the sand, or seeking the view from up high, the exhibit has been carefully planned to give the animals opportunities to stay active and challenged.

Click to view a video of the active bears at vimeo.com/4420527

Graphic Types

Species ID with “Cool Fact” Circle.

Sus scrofa
Wild Boar Кабан

Ranging around the world, boars are very adaptable and successful. In Russia's Far East, they're also a critical food for predators: when the boars decline, so do the cats. This region's boars grow especially big, mostly because of the availability of large and nutritious pine nuts.

What they eat:
They eat almost anything they come across, including nuts, berries, carrion, roots, and trash. Such a wide range of food sources has enabled wild boars to thrive in a variety of environments.

What they do:
The animals usually forage from dusk until dawn, resting for periods during both night and day.

How they're doing:
Wild boars are so successful that in many places they're considered pests. In the southern forests of Russia's Far East, numbers have declined as people have altered the forests.

Where they live
Wild boars adapt well to a variety of habitats but are most often found in forests and woods. Beyond their native range, they have also done well in other parts of the world where they have been introduced by humans.

Original Pigs
Wild boars are the ancestors of every pig in the world! They're adaptable, reproduce quickly, and have been bred by humans into countless varieties.




Conservation Panel with “Zoo in Action” Circle.

Russia's Grizzly Coast
How They're Doing Ситуация в настоящее время

Two visitors of the Exxon Valdez oil spill response in a school looking to a remote Kachemak Bay area in July 1989. Only small remnants of oil bars the beach today, a long way from the spill from the Exxon Valdez killed several thousand bears in its immediate aftermath.



Sea otter populations have gone down then up again. In some areas they remain at low levels. Off the Russian coast, poaching, overfishing, and spill of oil from the coast. Populations in California continue to just struggle, and populations in southeast Alaska are doing the same, but about 80% between the mid-1990s and 2011.

Recovery, Threatened
Perhaps 300,000 sea otters once ranged along 6,000 miles of northern Pacific coastline. After being pushed to the brink of extinction, their populations have recovered somewhat.

Black Gold of the Pacific
Russian explorers discovered the value of sea otters' soft, thick pelts almost 300 years ago. The Russian International fur trade moved relentlessly along the Russian Pacific coast, past Alaska, and down past California, wiping otters out along the way. When an international treaty banned furs in 1911, fewer than 2,000 sea otters remained.

Coming Back
Since the 1911 treaty, sea otters have rebounded to about 100,000. But otters are fragile and large numbers can die quickly. Disease, oil spills, overfishing, and poaching still threaten sea otters.

The Zoo In Action
The Minnesota Zoo has helped researchers why some sea otter populations are failing. Understanding the causes is the first step to a solution.

Adaptations Panel Typical

What's this?

Korean pine nuts are called "bread of the forest" because the large seeds provide such critical nutrition to many animals, including bears and boars.



These graphic typicals have proven successful and have begun to inform the design of other elements throughout the Zoo.

Russia's Grizzly Coast
Stealth in the Snow Хитрость на снегу

Eking Out A Living
Amur leopards are smaller than the tigers that share the same land. And all other leopards live in much warmer climates. So how do Amur leopards survive? They specialize.

Roamers
They open help leopards kill strong hares and rooks. Amur has particularly large rooks and their size helps in the snowy winter.

Quiet
Leopards move with astounding stealth. They often sneak close to prey before surprising it with a lightning dash.

Compact bodies
With smaller bodies in fact, leopards can get by on smaller catches than tigers.

Climbing
Leopards get above the competition with strong tree legs and climbing skills. An Amur can fit in a 100-pound deer in its jaws in a branch 15 feet up.

Senses
Excellent nighttime vision and acute hearing and smell help leopards function at night. During the day they often conserve energy by sleeping.



Long fur
They are warm with extra long winter fur. Summer coats are almost as long, but in winter they grow to almost three inches.

Leopard vs. Tiger
The last remaining habitat for Amur leopards overlaps with that of Amur tigers. The larger tiger would be at a disadvantage in a fight. Our leopards would have superior sight and climbing skills.

Can you find two leopards?

Long legs
Wild leopards legs that other leopards. Amur can leap through the region's snow.

Cool Fact
A leopard's paw has three pockets, helping it move silently. It's also large, as well as on the snow. The long, sharp claws are critical in climbing and hunting.

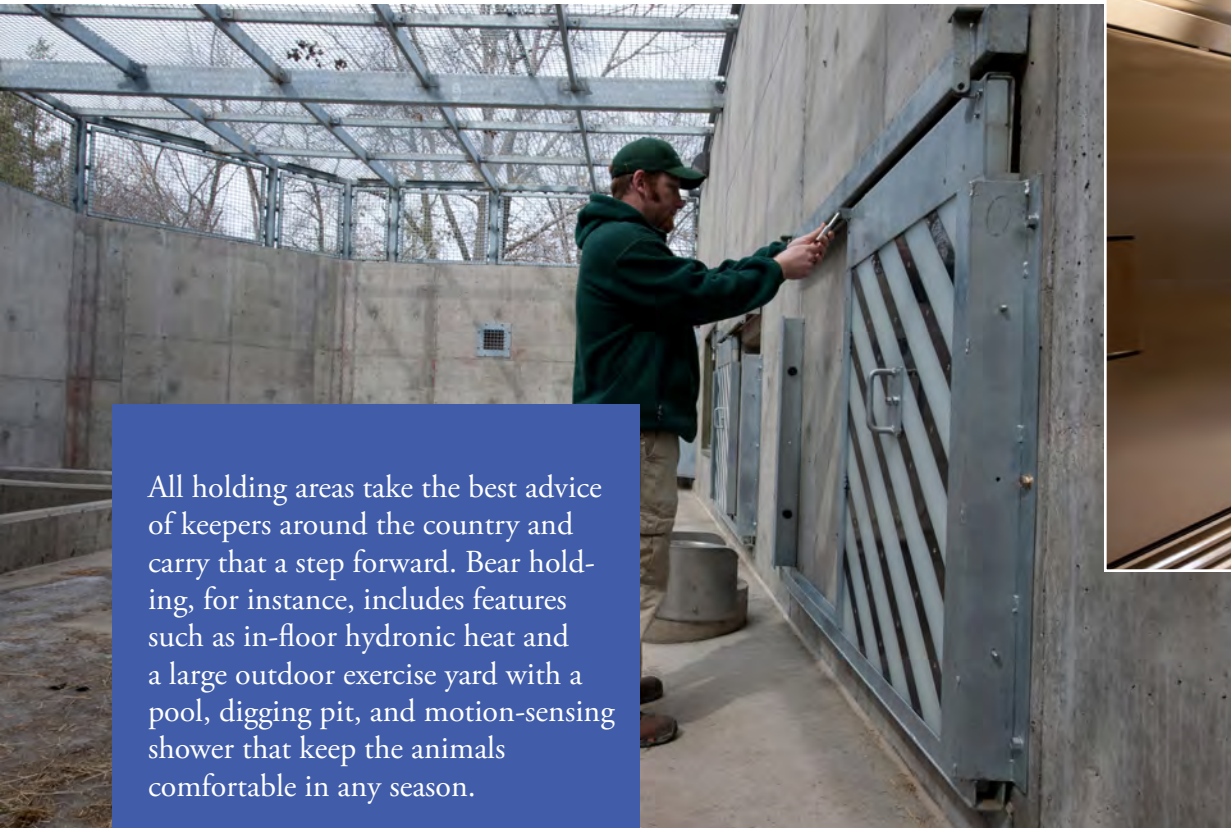



Behind the Scenes: EEC



The Education Event Center is the Zoo's first LEED-planned building. With an intensive green roof, local materials and geothermal heating, this is a model for future Zoo construction and for visitors to the space.

Bear Holding



All holding areas take the best advice of keepers around the country and carry that a step forward. Bear holding, for instance, includes features such as in-floor hydronic heat and a large outdoor exercise yard with a pool, digging pit, and motion-sensing shower that keep the animals comfortable in any season.

Press

Star Tribune

Date: Friday, June 06, 2008
 Location: MINNEAPOLIS, MN
 Circulation (DMA): 345,252 (15)
 Type (Frequency): Newspaper (D)
 Page: A1, A12
 Keyword: Minnesota Zoological Gardens

Responding to critics, new exhibits at the Minnesota Zoo being launched this weekend aim for closer encounters.



JEFFREY THOMPSON • jthompson@startribune.com

Jack Elmquist, 10, of Edina had a close encounter with a grizzly bear Tuesday at the Minnesota Zoo's new "Russia's Grizzly Coast" exhibit in Apple Valley. Come Saturday the general public can check out the \$30 million exhibit, too. Zoo officials hope it will prompt an outpouring of public and private financing.

FACELIFT BRINGS FACE TIME

By DAVID PETERSON
 dapeterson@startribune.com

"Oh-my-gosh-there's-one-right-THERE!" a woman cried out, flinching a bit when a grizzly bear materialized right beside her, her safety hanging by a three-quarter-inch wall of glass so clean it didn't seem to exist.

A few feet away, Mary Reed of Eden Prairie stood mesmerized as another furry giant swam past. "Don't you just want to touch 'em?" she asked a friend. "I want to touch that fuzzy little ear!"

The interaction, at one of a series of special previews, is just the sort of response the designers of the new \$30 mil-

lion addition to the Minnesota Zoo were hoping for.

"I liked it when the grizzlies pawed at the glass, like they wanted to get at you," said Andrew Nelson, age 12, of Eden Prairie.

Saturday's public unveiling of "Russia's Grizzly Coast" amounts to a re-launch of the 30-year-old zoo in Apple Valley, signaling a future closer to theme-park showmanship than the approach the zoo began with: drab concrete surrounded by a vast acreage stocked with sometimes hard-to-see animals.

Zoo continues: Oooohs and ahhhs. **A12**▶

A new exhibit at the Minnesota Zoo

The 3.5-acre exhibit representing Russia's Far East opens Saturday, showcasing the diversity of animals and rugged terrain of that part of the world. Because of similar latitudes, this little-known area is home to animals that fit into our variable Minnesota climate: sea otters, brown bears, wild boars and Amur leopards.

Immersing the visitor
 The sounds, environmental design and landscaping replicate the habitat of Russia, right down to the rumble of distant volcanoes and the look of rock formations and vegetation.

Amur leopards
 The zoo recently acquired two female Amur leopards from Audubon Nature Institute in New Orleans. Fewer than 30 of this type of leopard remain in the wild.

Grizzly Bears/Bear Meadow
 The rugged and actively volcanic Kamchatka Peninsula is home to the giant brown bears of Russia. Three orphaned brown bears from Alaska — Sadie, Haines and Kenai — are in the largest portion of the exhibit.

Wild boars
 Wild boars are most often found in forests and woodlands and are often the food source for the large cats. The exhibit includes the pair Boris and Natasha and their eight offspring.

Sea Otter Cove
 Along the coast, visitors will experience sea otters playing among coastal rock formations.

A bold new approach
 The details of the new exhibit emphasize the dramatic way in which zoos have borrowed from theme parks and even film sets to set new standards in zoo design.

See an interactive graphic of the new exhibit at startribune.com/projects.

MARK BOEWILL and KRISTINA PRAST • Star Tribune

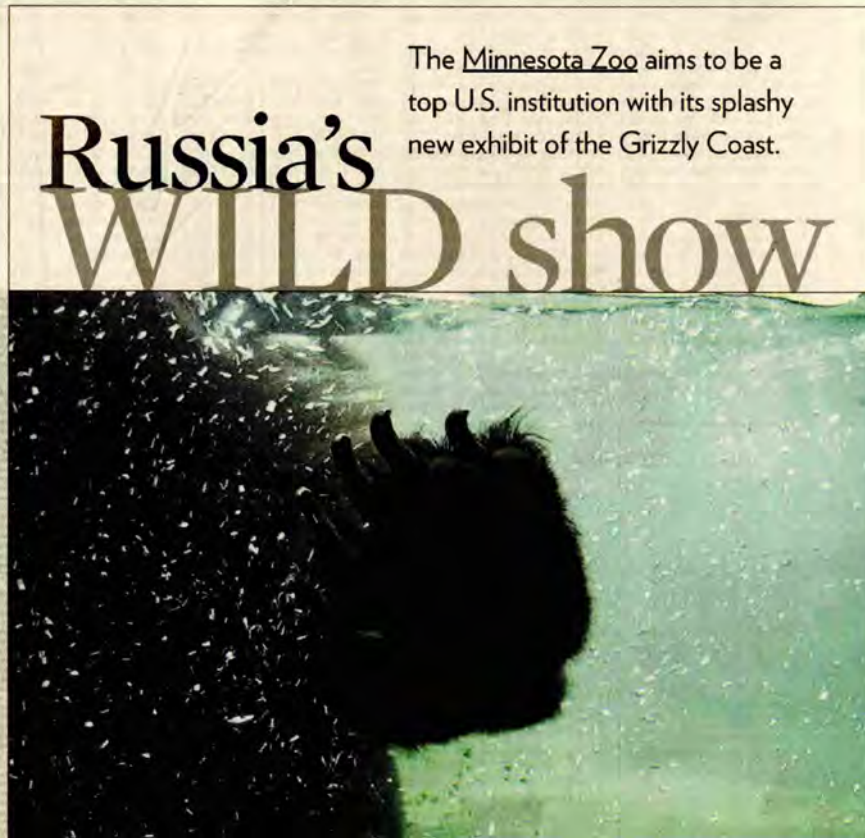


Crowds were wowed by grizzly bears Tuesday and whipped out their cell phones to capture images at the Minnesota Zoo. Feeding zones draw the animals close to people.

Press

SAINT PAUL
PIONEER PRESS

Date: Friday, June 06, 2008
 Location: ST. PAUL, MN
 Circulation (DMA): 191,591 (15)
 Type (Frequency): Newspaper (D)
 Page: 1,5
 Keyword: Minnesota Zoological Gardens



The Minnesota Zoo aims to be a top U.S. institution with its splashy new exhibit of the Grizzly Coast.

Russia's WILD show

PIONEER PRESS PHOTOS: MARICELLA MIRANDA

By **Maricella Miranda**
mmiranda@pioneerpress.com

A geyser erupts from the earth as giant grizzlies harangue each other on a nearby grassy hill. The bears climb barren trees and scoop up trout from a pool. On the tallest rock, they watch sea otters swim through tunnels of cave formations.

Online
 Use our interactive

This is the wild, wild East — and it's closer than you think. The Minnesota Zoo on Sat-

map to watch video of the exhibit's animals at twincities.com

urday will unveil "Russia's Grizzly Coast," its most significant exhibit since it opened and most expensive in more than a decade. The \$24 million permanent exhibit — two years in the making — showcases the Russian Far East with grizzly bears, sea otters, rare Amur leopards and wild boars living on a landscape covered with

RUSSIA'S WILD SHOW, 5A >

new research center, where another window displays a forest — home to the Amur leopards. But it can be difficult to see the spotted cats.

The journey can either continue to the Amur tiger den or circle back to the Central Plaza.

"We really think we developed one of the great zoo exhibits on earth here in Minnesota with 'Russia's Grizzly Coast,'" Ehmke said.

Maricella Miranda can be reached at 651-228-5421.

IF YOU GO

The new \$24 million "Russia's Grizzly Coast" exhibit opens Saturday at the Minnesota Zoo, 13000 Zoo Boulevard in Apple Valley. Zoo hours are 9 a.m. to 6 p.m. Tickets are free for children under 2, \$8 for those age 3 to 12, \$14 for those 13 to 64, and \$9 for those 65 and older. More information is available by calling 952-431-9200 or visiting mnzoo.com.

Grizzly bears

Sadie, Haines and Kenai came from the Alaska Wildlife Conservation Center, where they lived for two years after being rescued as cubs. The grizzlies tip the scales between 200 to 500 pounds but may reach 1,300 pounds and top 10 feet in height when fully grown. In the wild, they feast on salmon found in coastal waters and streams.



Wild boars

Boris and Natasha, who are 5 to 7 years old, came from a private facility in Tennessee. The couple had eight piglets — known at the Minnesota Zoo as boarlettes — two months ago. The babies also will be on exhibit with their parents.

Minnesota Zoo over 30 years

New exhibits expand the zoo from 1,200 animals and 238 species when it opened to 2,449 animals and 445 species today.



Russia in Minnesota

A new \$24 million exhibit at the Minnesota Zoo in Apple Valley highlights animals from their Russian Far East environment. For an interactive version of this map, go to twincities.com.



“I think it’s fabulous. I love every part of it. The fountain, the sculptures. It’s great for kids of all ages and for me. They tried to make a good view. The bears are always right there.”

- Quoted in Summative Evaluation

“

”

Recognition

Section



Section F - Recognition



Design

The Portico Group
Architectural Alliance
PBS&J
Zoo Horticulture Consulting and Design

Project Management

Sterns & Associates

Construction

Mortenson Construction
Cemrock Naturalistic Environments
Aloha Landscaping
Split Rock Studios

Minnesota Zoo Team

Lee Ehmke, Director and CEO
Connie Braziel, Deputy Director and COO
Melissa Lindsay, Director, Minnesota Zoo Foundation
Peggy Adelman, Chief Financial Officer
Lars Erdahl, Education Director
Dr. Ron Tilson, Conservation Director
Kevin Willis, Biological Programs Director
Tony Fisher, Collections Manager
Steve Boyd-Smith, Interpretive Projects
Diane Fusco, Marine Mammals Supervisor
Diana Weinhardt, Northern Trail Supervisor

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The Watchmaker Family

Conservation Partners

Amur Leopard and Tiger Alliance
Zoological Society of London
Wildlife Conservation Society
Phoenix Fund
Tigris Foundation
US Fish and Wildlife Service
Alaska Game and Fish Department

“... very natural, very lifelike, very inviting and informative. I really enjoyed it. It’s such a natural environment. It’s not fake.”

- Quoted in Summative Evaluation



Media Release

Section



Section G - Media Release

Institution Name

Minnesota Zoo

Award Category

Exhibit

Program or Exhibit Title:

Russia's Grizzly Coast and Central Plaza

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952.431.9217
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Public Relations Department Head:

Bill Von Bank, Director of Sales and Marketing

Construction/Consultation Companies:

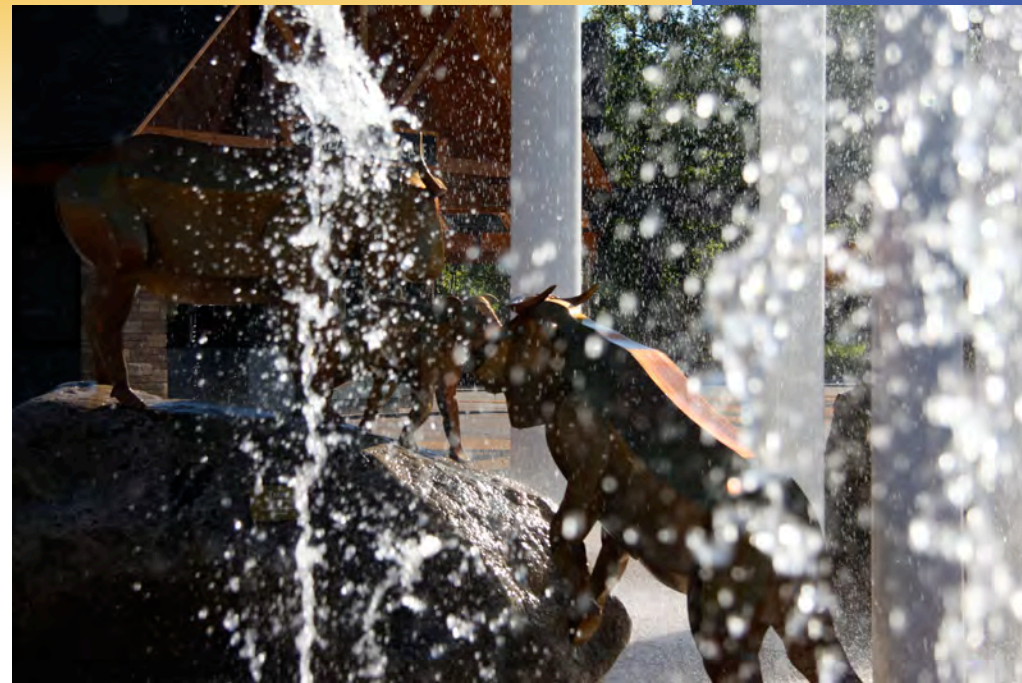
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PBS&J
Zoo Horticulture Consulting and Design

Project Management

Sterns & Associates

Construction

Mortenson Construction
Cemrock Naturalistic Environments
Aloha Landscaping
Split Rock Studios




Quote from the institution's Director:

"*Russia's Grizzly Coast* and the Central Plaza have transformed the Minnesota Zoo," said Minnesota Zoo Director/CEO Lee Ehmke. "Not only is it the first major exhibit ever developed with a specific focus on the Russian Far East--one of the world's least-known, most spectacular and threatened wilderness areas--but it has set a new bar for our Zoo in terms of drama, beauty, educational impact and conservation relevance. We are pleased that our professional peers have recognized this project's excellence, further evidence of the success of *Russia's Grizzly Coast*, which has led to record-setting attendance and positive 'buzz' surrounding the Zoo since it opened last year."

Summary (to be utilized in developing press release):

Russia's Grizzly Coast is the Minnesota Zoo's largest exhibit initiative since the Zoo's opening in 1978. The \$24 million exhibit features state-of-the-art technology that creates an authentically immersive experience, one reflective of the Russian Far East region with grizzly bears, sea otters, Amur leopards and wild boars. The opening of *Russia's Grizzly Coast* was a significant initiative within the Zoo's five-year plan in support of the overall initiative of becoming one of America's top 10 zoos. *Russia's Grizzly Coast* is the catalyst for increased visibility, attendance and momentum for the Minnesota Zoo.



*“Amazing.
[Bears] can be playful.
[They] like to swim. One was showing off.
Amazing to see them up close.”*

- Quoted in Summative Evaluation

Summative Evaluation

Executive Summary

Russia's Grizzly Coast Summative Evaluation

- Guests had very positive affective responses to the exhibition. *Russia's Grizzly Coast* had a Net Promoter Score of 96%, which was higher than any of the Zoo's other exhibitions.
- Post-visit guests expressed more awe (18%) about the animals and habitat of Russia's Far East than baseline visitors (8%).
- Post-visit guests were significantly more likely to mention habitat in their descriptions of animals than guests in the baseline study. This is a strong impact of the exhibition's emphasis on habitat.
- Baseline and post-visit guests shared similarly strong understandings of conservation. (This is consistent with other studies at zoos that show that guests tend to come with strong, pre-existing knowledge and attitudes about conservation.) However, a comparison of their explanations shows that post-visit guests related conservation more strongly with habitat and prey than baseline guests.
- Guests exited the exhibition knowing more about the animals of Russia's Far East.
- About a third (30%) of post-visit guests were able to describe the environment of Russia's Far East in extensive detail

This report presents findings from an external evaluation of the Minnesota Zoo's exhibition, *Russia's Grizzly Coast*. This is the first exhibition of its kind featuring the landscapes and animals of Russia's Far East. The exhibition has been designed to connect guests with nature and encourage affective, cognitive, behavioral, and institutional changes that support conservation. The summative evaluation of *Russia's Grizzly Coast* was a study of guests' experiences with both the animals and the environment of this exhibition, and included a focus on conservation learning. The study was designed and implemented by Kirsten Ellenbogen in consultation with project staff from the Zoo, Steve Boyd-Smith and Grant Spickelmier (see pre- and post-instruments in Appendix III).

Methods

The summative evaluation of *Russia's Grizzly Coast* was split into a baseline and post-visit study. For the baseline study interviews, 204 adult guests were randomly recruited in the Minnesota Zoo lobby and in the space between the *Minnesota Trail* and the *Tropics Trail*. These interviews took place in April and May of 2008, before the press for the new exhibit took off. For the post-visit study interviews, 197 adult guests were randomly recruited as they left *Russia's Grizzly Coast*. These interviews took place in September and October 2008, 3-4 months after opening. The post-interviews were conducted as summer crowds tapered off in order to avoid overlapping with the August 2008 Visitor Survey by Morey Group. Data was collected by Kirsten Ellenbogen, Patrick Smith, and Kisha Delain. Data was analyzed by Kirsten Ellenbogen and Sarah Cohn. Initial findings were discussed with project staff and revised to respond to critical questions that emerged from the draft report.

Findings

The demographics of the baseline and post survey guests were very similar. There are only statistically insignificant differences between the baseline and post-visit guests (see Appendix 1, Tables 4-6). The largest adult age groups were 31-40 and 21-30 year olds. Most guests were White, and more than three-quarters came to the Zoo in adult-child groups.

Affective Impacts

The visitor experience goal for this exhibition includes an affective impact: "The visitor will feel awe as they explore the Russian Far East, observe animals behaving naturally — as they would in the wild — and learn about the challenges to their survival." The project staff was particularly interested in whether guests expressed awe and how guests' responses compared to marketing studies conducted in the past.

Responses to the exhibition were analyzed in two primary ways to measure affect. First was the net promoter score, which measures customer loyalty (see more about this measure, developed by Satmetrix, Bain & Company, and Fred Reichheld at

www.netpromoter.com). Second, guests' responses to the questions about the animals and the overall exhibition were examined for affective expressions (such as "cool" and "fabulous").

For the net promoter score, guests were asked if they would recommend this exhibit to others. Almost all (96%) of the post visit survey participants gave it one of the highest two ratings (6 or 7, on a 7-point scale). These respondents fall in the promoter category: loyal enthusiasts who will refer others. The remaining 4% of respondents fall in the passive promoter category (4 or 5, on a 7-point scale). These respondents are satisfied, but unenthusiastic supporters. There were no detractors, so the overall net promoter score for *Russia's Grizzly Coast* is 96%. Guests' enthusiastic comments about the exhibition support this strong net promoter score:

- "Fantastic. [*Russia's Grizzly Coast*] greatly improved what the Minnesota Zoo was. It was a great zoo and now it's even better,"
- "We love [*Russia's Grizzly Coast*]. We came back in after the movie just to see it. It's our new favorite since the dolphin show is cancelled."

In the 2008 Visitor Survey Report, the Zoo's overall net promoter score was 71%. *Russia's Grizzly Coast's* had a net promoter score of 96% in this study and 80% in the Zoo's 2008 Visitor Survey. Both scores are higher than any other exhibition or show.

Guests' responses to requests to describe the animals and comment on the overall exhibition did include expressions of awe (see the complete list of affective responses in Appendix II). In the baseline interviews, before the exhibition opened, 8% of the responses included a spontaneous affective description of the animals. Questions asked to get these responses Guest comments in these baseline interviews include:

- "I love the way [that sea otters] are playful and energetic."
- "[Grizzly Bears] are awesome, just cool to see."

In the post visit interviews, the spontaneous affective responses about the animals more than doubled to 18%. These post-visit affective descriptions are also more descriptive:

- "I loved watching [the sea otter] swim. Very graceful, so big. It seemed to be sleek."
- "Amazing. [Grizzly Bears] can be playful. [They] like to swim. One was showing off. Amazing to see them up close."

When asked directly, guests expressed a strong enthusiasm for *Russia's Grizzly Coast*. This enthusiasm was echoed in guests' open-ended responses to questions about the animals and exhibitions. This project has an institutional goal of increasing attendance by 10% in the exhibition's first two years. The strength of the net promoter score for *Russia's Grizzly Coast* indicates that the Zoo may be able to leverage the exhibition to meet this goal.

Cognitive & Attitude Impacts

Toward the end of the post-visit interview, guests were asked to describe the most interesting thing they learned during their experience in *Russia's Grizzly Coast*. Responses tended to fall into five primary categories: Animal Characteristics; Animal Activities Observed; Habitat; Conservation; and, Learned Nothing.

1. Animal Characteristics (32%): "How many game animals it takes to keep tigers going." Guests' comments related to animal characteristics tended to fall into two sub-categories: the animal's food and the animal's habitat.
2. Animal Activities Observed (23%): "Thrilling to see the bear swim"
3. Habitat (16%): "The landscape, the vents, volcanoes, the environment there. The link with MN and it's sorta similar to here too."
4. Conservation (9%): "Man has to start protecting wildlife or there will be no wildlife for generations to come." Of the conservation-related responses, 9 mentioned leopard, 1 specifically mentioned Amur Leopard, and, 1 said Cat. One individual highlighted "the perspectives inside the cabin structure and the vote to save the species." Only 1 mentioned the loss of environment and one said poaching information was interesting. There were no responses in this category that focused specifically on the loss of prey.
5. Learned Nothing (14%): These guests reported that they did not learn anything. Some of these responses included a comment about a lack of time to read labels, suggesting these guests have a content-focused view of learning that is more consistent with school-based education.

Only a very small number of guests (6%) gave a response that did not fall into one of the five primary categories. These other responses included comments such as "it was more visual" or "we couldn't stay long with the kids."

Knowledge about the Animals. In the post-visit interview, guests were asked to name the animals that live in Russia's Far East. The exhibition focuses on four animals: brown bears, sea otters, Amur leopards, and wild boars. Fully 41% of the guests were able to name all four of these animals. Another 28% named three of them. Only 4% of the guests could not name any of these animals.

Half of the guests (52%) named the grizzly bear or brown bear first. The wild boar was left off the listing of animals most frequently, but was mentioned in 60% of the responses. Below is a list of the other animals named and the number of guests who mentioned them:

Leopard (baby, spotted, snow) – 9	Beavers/Otters – 4
Tigers – 84	Caribou – 4
Salmon – 32	Moose – 3
Deer – 13	Fox – 2
Birds (Pelicans, Ducks, Geese,) – 10	Seals – 2
Amur Tigers – 9	Birds of Prey (Eagle) – 2
Elk – 9	Horses – 2
Wolf – 9	Puffins – 1
Small mammals (Ferret, Lemur) – 5	Owl – 1
Other (Carnivores, Yaks, Mammoths) - 5	Hares – 1

Knowledge about the Region. In the baseline interview, respondents were asked if they had ever heard of the area called Russia’s Far East. More than a third (37%) said they had, so were asked to describe what they knew. About half (58%) of the baseline study guests who said they were familiar with the region were able to provide at least a minimal description (e.g., cold, vast, near Siberia). Most of these responses focused on the location of the region. Only two of the guests in the baseline study were able to provide a detailed description of the region and its environment.

Post-visit descriptions of the Russian Far East environment tended to fall into four categories:

- Minimal Detail (43%): Provided a brief, general, description; “Cold, vast,” or “barren and cold.”
- Extensive Detail (30%): Provided a highly specific description or multiple details. “Very forested and cold; very diverse area; lots of different types, trees, coastline, mud pots.”
- Other (11%): Provided a description that accurately depicted the environment, but it was specific to the exhibition rather than the Russian Far East.
- Don’t Know (16%): Reported that they did not know or could not provide a description.

Overall, more than three quarters (84%) of the guests were able to describe the environment of Russia’s Far East after experiencing the exhibition. Before the exhibition opened, only 1% of visitors had a demonstrable awareness of the Russian Far East (though about 18% claimed some vague awareness). Afterwards, 30% could describe the region in great detail (and 84% indicated some level of knowledge).

Knowledge about Conservation. Guests were asked to rate the strength of the link between taking care of an animal and taking care of its habitat. The majority of guests, both baseline and post-visit, rated the strength of the link a 7, on a scale of 1-7. Guests at the Zoo had a very strong understanding of the link between animals and habitats before visiting *Russia's Grizzly Coast*.

Table 1: Strength of the Link between Animals and Habitat

Strength of Link	Baseline	Post Visit
1	0%	0%
2	0%	0%
3	0%	0%
4	0%	1%
5	6%	5%
6	14%	12%
7	79%	82%
Average	6.71	6.75
Standard Deviation	0.66	0.59

There are significant differences among the examples guests gave to explain the connection between animals and habitats. (See Table 2 and sample examples below.) Both baseline and post-visit guests were significantly more likely to mention habitat in their explanation or to provide a specific example if they rated the link between caring for an animal and its habitat at the highest level (i.e., a 7). Additionally, post-visit guests were twice as likely to mention habitat in explaining the link between caring for an animal and its habitat. Post-visit guests were more than four times as likely to mention prey in their explanation.

Table 2: Attention to Poaching, Habitat, and Prey

Rating of Link: Habitat-Animal	Baseline Guests			Post-Visit Guests		
	Mentioned Poaching	Mentioned Habitat	Mentioned Prey	Mentioned Poaching	Mentioned Habitat	Mentioned Prey
4	0	0	0	0	0	0
5	0	<1%	0	0	3%	0
6	<1%	1%	2%	<1%	5%	2%
7	2%	13%	4%	2%	26%	17%

Baseline Study - Examples related to Poaching, Habitat, and Prey

Poaching – The grey wolf in Wyoming, because of cattle ranchers perceiving them to be predatory on cattle. They are killing them off but you've got to give them some place to live.; I'm pissed about the timberwolves being delisted and over fishing.; So the animals move to new areas in search of shelter but they get hunted or just go extinct.; Also over fishing in the sea.;

Loss of Habitat – Rainforest destruction; Farmers are plowing up the land so there is less of it for the animals.; If there is no environment for them to live in they don't have a home.; Wild hogs in Arizona, where they are encroaching on their habitat. If they (hogs) don't have a place to live away from domestic animals and humans they won't survive; People building up in their environments.;

Loss of Prey – If you take away its habitat you take away the animal. If you take away its food you kill the animal.; If it doesn't have habitat it can't get food and it's natural survival instincts are all thrown off.;

Post-Visit Study - Examples related to Poaching, Habitat, and Prey

Poaching - If you leave them alone they'll be fine. Keeping people out, laws to enforce that.; Can't have poaching, can't grade down their land, building.; Stop hunting animals in general.; The extinction of the buffalo, or the near extinction of the buffalo.; The fish are, I just read recently, the fishermen are taking all the fish.

Loss of Habitat - Just saw the tiger. You don't have enough area preserved for them to live.; They need their habitat in order to live. If you don't take care of their habitat they can't live; they just need space. Tigers need a major amount of land to be happy.

Loss of Prey - The amount these tigers consume in a year. It talks about needing the size of the Twin Cities area to support the amount of prey they eat to survive.

Guests were also asked how important the Minnesota Zoo is for wildlife conservation. About three quarters of the guests, both baseline and post-visit, rated the level of importance a 6 or 7, on a scale of 1-7. Guests at the Zoo, in general, had a very positive attitude about the Zoo's conservation work before visiting *Russia's Grizzly Coast*. There is no difference between the responses of the baseline and post-visit guests

Table 3: Importance of Zoo for Wildlife Conservation

Conservation Importance of MN Zoo	Baseline	Post-Visit
1	1%	0%
2	0%	1%
3	2%	3%
4	7%	7%
5	24%	17%
6	25%	30%
7	40%	42%
Average	5.86	5.98
Standard Deviation	1.24	1.14

These findings are consistent with the Multi-Institution Research Project (MIRP) study conducted at zoos across the country (Falk et. al., 2007). That study that showed, across multiple institutions and thousands of guests, there was no significant cognitive gains about general conservation issues. This was due in part to the fact that guests tend to come to the zoo with a high level of knowledge about ecology and conservation.

Conclusions

Guests were almost unanimous in recommending *Russia's Grizzly Coast* to their colleagues. Post visit guests were able to name the animals in the exhibition and describe animal characteristics in detail. More critically, post-visit guests' descriptions are highly likely to mention the animal's habitat.


Comments from post-visit guests include significant amounts of content and vocabulary that matches the exhibition labels. Guests *are* reading the labels and are quick to integrate that information into their experience. Further research on this could more clearly identify knowledge learned through observation and through reading graphics.

This summative study found that there is not a significant difference between incoming and outgoing attitudes about the Zoo's role in conservation. This finding is consistent with national studies of zoo experiences (Falk et.al., 2007). Although that may initially seem like a negative finding, it is important to reinforce previously held knowledge, attitudes, skills, and beliefs – often derided as “preaching to the choir (Storksdieck, Heimlich, & Ellenbogen, 2005).” Affirmation is a necessary part of identity-building and the overall learning experience. A person's identity is not fixed or static; it is in a constant process of development. People tell others who they are but more importantly, they draw on available resources to try and act as though they are who they say they are. It is not only valid, but also important for conservation education experiences to consider identity building as a positive learning outcome.

References

Falk, et. al., (2007). *Why zoos and aquariums matter: Assessing the impact of a visit to a Zoo or economy*. Internal Report. Available at:
<http://www.aza.org/ConEd/MIRP/index.html>

Storksdieck, M., Heimlich, J., & Ellenbogen, K.M. (2005). Factors that influence free-choice learning about environmental conservation. *Environmental Education Research*, 11(3), 353-370.

A photograph of a concrete drainage area. In the center, there is a circular drain cover with a textured, embossed design. To the left, a shadow of a person is cast onto the concrete. The background shows a rough, weathered concrete surface with some debris. The lighting is bright, creating strong shadows.

“I think it’s beautiful. It’s visually stimulating for the kids, there’s lots of things to climb on. There’s lots of space to see even when it’s crowded. I like the underwater viewing for otters, bears.... The kids’ favorite part is the bubbling mud when it’s not so cold out.”

- Anonymous Visitor Comment

Appendix 2

Construction Conservation Facts

Education Event Center:

1. The building has a vegetative roof with native plantings over white roof membrane.
2. A geothermal heat pump system utilizes earth temperatures for heating and cooling.
3. The building has a cast-in-place concrete structure with 25% recycled content admixtures.
4. The majority of products used in construction were manufactured within 500 miles.
5. Carpet tiles were made with recycled content.
6. The building has operable low E, argon-filled wood windows and high-efficiency, low-energy prismatic lighting.
7. The building has natural and non-mechanical ventilation systems.
8. In-floor hydronic heating throughout the building produces even thermal comfort at occupant level.
9. Forest Stewardship Council-certified agrifiber wainscot paneling covers the inside walls.
10. Doors are made of certified wood and have domestic hardwood veneers.
11. High-efficiency hand dryers in the bathrooms eliminate towel waste.
12. Resource efficient plumbing fixtures were utilized.
13. Wall tiles are made of recycled glass.
14. Furnishings include recycled content furniture, as well as wall and floor porcelain tiles and countertops.
15. Water-based penetrating wood finishes were utilized.
16. The building's paperless gypsum wall panels resist mold/mildew growth.
17. A bio-infiltration basin collects surface rainwater runoff.
18. Design and construction met the standards set forth in the Minnesota Sustainable Building Guidelines. The Zoo has also applied for LEED certification.



Russia's Grizzly Coast, general:

1. All concrete used for construction contained fly ash, an industry waste product that would have ended up in the landfill.
2. Much of the granular fill that serves as a base for concrete throughout the *Russia's Grizzly Coast* exhibit consists of recycled and reground debris.
3. Floors and walls in all off-exhibit animal areas were coated with low volatile organic chemical (VOC), water-borne epoxies – a more eco-friendly alternative to traditional coatings.
4. All construction and demolition waste was sent to a local company that sorted and recycled as much as possible. All concrete and steel materials were recycled and 55% of the remaining materials were recycled.
5. Many buildings are earth sheltered, providing natural insulation.
6. In addition to the Education Event Center, the Life Support Building has a partial “green,” or vegetative, roof.
7. All off-exhibit animal and keeper areas were built with skylights to reduce the need for artificial lighting.
8. The new *Russia's Grizzly Coast* exhibit has incorporated bio-swales for rainwater instead of directing the water directly to the sewer.
9. The new *Russia's Grizzly Coast* exhibit utilizes drip irrigation throughout the exhibit to reduce the loss of water due to over-spray and transpiration.



Russia's Grizzly Coast
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