



Alive

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CEO's Letter



Current research indicates that modern-day humans can be traced back genetically to the continent of Africa. That means we're ultimately a warm-climate species, even though we have adapted to cold regions. Perhaps this is why our hearts soar during those first warm days of spring. Great apes - our close relatives and similar in so many peculiar yet amazing ways to humans - are also warm-climate animals. It's fun to watch apes like the bonobos sunning in their new outdoor exhibit. In this issue (page 8) you can find out how the Milwaukee County Zoo's bonobos have enjoyed their first year in this exhibit among the trees. Better yet, please come to the Zoo and go to the outdoor deck where you can view the bonobos and their gorilla neighbors. Watch for Naku, the new female gorilla (page 6). She's the smallest of her family group of three gorillas, including Femelle and Cassius, the silverback.



Exploring the new bonobo exhibit in spring 2011 were Zoo Director Chuck Wikenhauser (left), ZSM Board Chairman Rich Tennessen, and Dr. Robert Davis, ZSM CEO.

Whether you're visiting an animal indoors or out, take time to consider the design of its exhibit. Modern zoo exhibits strive to meet not only animals' physical needs, but also their mental needs. Intelligent species such as great apes require significant mental stimulation. That's one of the reasons why researchers have been visiting our Zoo to study how bonobos think and use tools (page 10). Indeed, the impressive cognitive ability of great apes and their puzzle-solving abilities must be taken into account when exhibits are designed, to make them "orangutan proof" (page 22).

We share so much with great apes, especially bonobos. We mourn the passing of Lody the bonobo (page 25), who suffered from a condition that too many humans can relate to: heart disease. His death leaves a hole in many hearts, but we can take consolation in the fact that his willingness to participate in his own heart healthcare during exams here at the Zoo means that other great apes will benefit from what we learned from him, a truly "great" ape.

Scientists aren't the only people who come to the Zoo to learn. Each year thousands of children learn about wildlife and conservation in Zoological Society of Milwaukee (ZSM) education classes and summer camps. Discover how ZSM instructors create "a thousand pieces of fun" daily (page 18). Even more fun was made possible by the generosity of Jeff Anderson, a Milwaukee Public Schools educator who donated 67 Folkmanis animal puppets to us as educational aids (page 21). Teaching about animals - even those that have been extinct for millions of years - is one of the missions of the Zoo and the ZSM. That's why this summer you'll find new dinos in the return of the popular Adventure Dinosaur!, sponsored by Sendik's Food Markets (page 4).

Seeing our Zoo from a different perspective is another way to learn. You can view the Zoo from a new angle by taking a ride (page 12) or getting a guided tour (page 15) or taking a train through the woods (page 14). If you're a real train aficionado, get the inside story on how two talented men maintain two operating steam engines, a rare breed in Wisconsin (page 14). There is truly something of interest for everybody at the Zoo. We look forward to seeing you soon.

Robert Davis

Dr. Robert (Bert) Davis
 Chief Executive Officer

Alive



*Tyrannosaurus
rex baby*

4 *Dinoscience!*

Dinosaurs are back at the Milwaukee County Zoo in May for Adventure Dinosaur!, sponsored by Sendik's Food Markets. What's the science behind these life-size animatronic animals, and what's new about *T. rex*?

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Lody the bonobo was known for his heart. He leaves a legacy of scientific data about ape heart health.

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ZSM-trained guards use GPS units in one of the world's largest jungles to help protect bonobos.

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An African black-footed cat, a golden-breasted starling, two bongos and a polar bear.

Contributors

See the insert packaged with this *Alive* that includes a list of Platypus Circle members, Serengeti Circle members and Simba Circle members.

Annual Report

The Zoological Society's 2010-2011 Annual Report will be published online in May.



Bonobos Deidre and her mom, Kosana, who's deceased.



DINOSCIENCE!

In the face of a life-size, roaring *Tyrannosaurus rex* model, you might be too busy looking for an escape route – just in case – to think about why it's so realistic. The truth is, it's taken scientists decades of research to construct what these so-called "terrible lizards" really looked like. Then commercial companies combined engineering with scientific research to create life-size robotic models. Billings Productions is one such company and is bringing years of experience and dino-building to the Milwaukee County Zoo this May with Adventure Dinosaur!, sponsored by Sendik's Food Markets.

Billings has been creating life-size robotic dinosaurs since 2003 to educate and awe the public. This year Billings is bringing to our Zoo these seven "new" dinosaurs, ones that you haven't seen here in the past:

- The herbivore *Edmontonia* at 4 tons tries hard to measure up to *Tyrannosaurus rex*, but falls short of the dino king's size. Still, our Canadian neighbor (its fossils were found in Alberta, Canada) looks cool with its spiky armor.
- *Acrocanthosaurus* will awe you with its spiny back and serrated teeth (for eating meat). This 2.4-ton predator used to roam the U.S. Southwest.
- *Stegoceras* will rear its thick, horned skull, but don't be scared of his curved teeth. He's an herbivore!
- *Coelophysis* had a head like a stork and a curved neck like a swan, but his sharp teeth and swift speed ensured he was no sitting duck.
- You could probably guess *Carnotaurus* is a carnivore; this "meat-eating bull" had horns above its forward-facing eyes.
- *Chasmosaurus* has three horns like a rhino, but the giant frill on its head might remind you of fellow herbivore *Triceratops*, who is from the same subfamily of dinosaurs.
- *Massospondylus* and its baby are one of three dino families that zoogoers will see this year. Did you know *Massospondylus* hatchlings were born without teeth, just like humans? They had to rely a lot on adults for help!

Meanwhile, some favorite dinos from past years will return. *Tyrannosaurus rex* will still roar and tower over zoogoers with its fearsome teeth to protect baby *T. rex* and the rest of the nest. *Stegosaurus* will swish its spiky tale once again. *Dilophosaurus* and its baby will be here, too, to squirt you with their dino spit (it's just water)! *Brachiosaurus*, with its nearly 19-foot-long neck, will be back, searching for leaves. There are more – 17 types of dinosaurs in all.

Many of us "know" what dinosaurs look like, since we've seen pictures in books, on television, and at museum exhibits. How do dino experts know what dinosaurs looked like just from analyzing their bones? Paleontologists follow marks on dinosaur bones to see where muscles would have been connected. This allows a basic shape of the dinosaur to emerge. Besides bones, there are also fossils of armor that dinosaurs had, like *Edmontonia*. Fossilized imprints of dinosaur skin also helped determine that many dinosaurs had scaly skin like reptiles. Not all dinosaurs had scales, however. We know some dinosaurs had feathers because of well-preserved fossils found in the 1990s. In 2007, paleontologists discovered that *Velociraptor* had feathers, proven by quill knobs found on its bones. It kind of changes how you view those "Jurassic Park" movie predators now, right?

Beyond fossils of actual body parts, footprints and tracks can show how fast a dinosaur was going, whether it walked on two or four legs, and how it carried its tail while walking and resting. The size of footprints can also help

T. rex

determine a dinosaur's weight and size, since its feet had to support its whole body. Last fall scientists announced yet a new way to scan dinosaur skeletons and create computer models to estimate weight. As a result, they increased the estimated weight of Sue, the largest *T. rex* skeleton ever found, to more than 9 tons. Previous models put the *T. rex* as weighing only 4½ to 6½ tons. (One of the scientists conducting the research, which was published in the journal "PLoS ONE," is from the Field Museum of Natural History in Chicago, which exhibits Sue's skeleton, shown at right.) At the same time, scientists said that *T. rex* was not as fast as once thought. Instead of running at 30-40 miles per hour, *T. rex*, with all that weight, probably had peak speeds of 10-25 miles per hour. The Zoo has a tradition of painting *T. rex* footprints on the pathways leading from the entrance atrium all the way to the west end of the Zoo, where the dinosaurs are on display. In the past, those footprints were spaced as if *T. rex* were running at about 27 miles per hour. That's probably faster than the giant carnivore could go.

Despite what scientists have discovered, we still can't be sure what dinosaurs sounded like, or what colors they were. For Billings Productions, it takes a little bit of audio mixing and a lot of imagination to create the colorful, roaring dinosaurs that will tower over zoogoers' heads. The thunderous bellowing and low-pitched grunts you'll hear are actually created from mixing and distorting combinations of real-life animal sounds. Deciding what colors to make the dinosaurs is also a creative venture for the company. "Our artists select something that would seem feasible," says Trey Billings, vice president of operation at Billings Productions, explaining that "while there are hints of some colors on dinosaurs from fossil records, for the most part it's the imagination of our artists." Billings says his company strives to make their dinosaurs seem as real as possible to create the most exciting experience for our Zoo. "For me, it's about the reactions of the kids when they see the exhibit; that's what I enjoy most," says Billings.

Baby *T. rex* will be on the prowl in the Zoo's entrance atrium, the U.S. Bank Gathering Place, in April to remind you to gather up your courage and follow the adult *T. rex* footprints to a new adventure, starting Memorial Day Weekend.

By Liz Mauritz



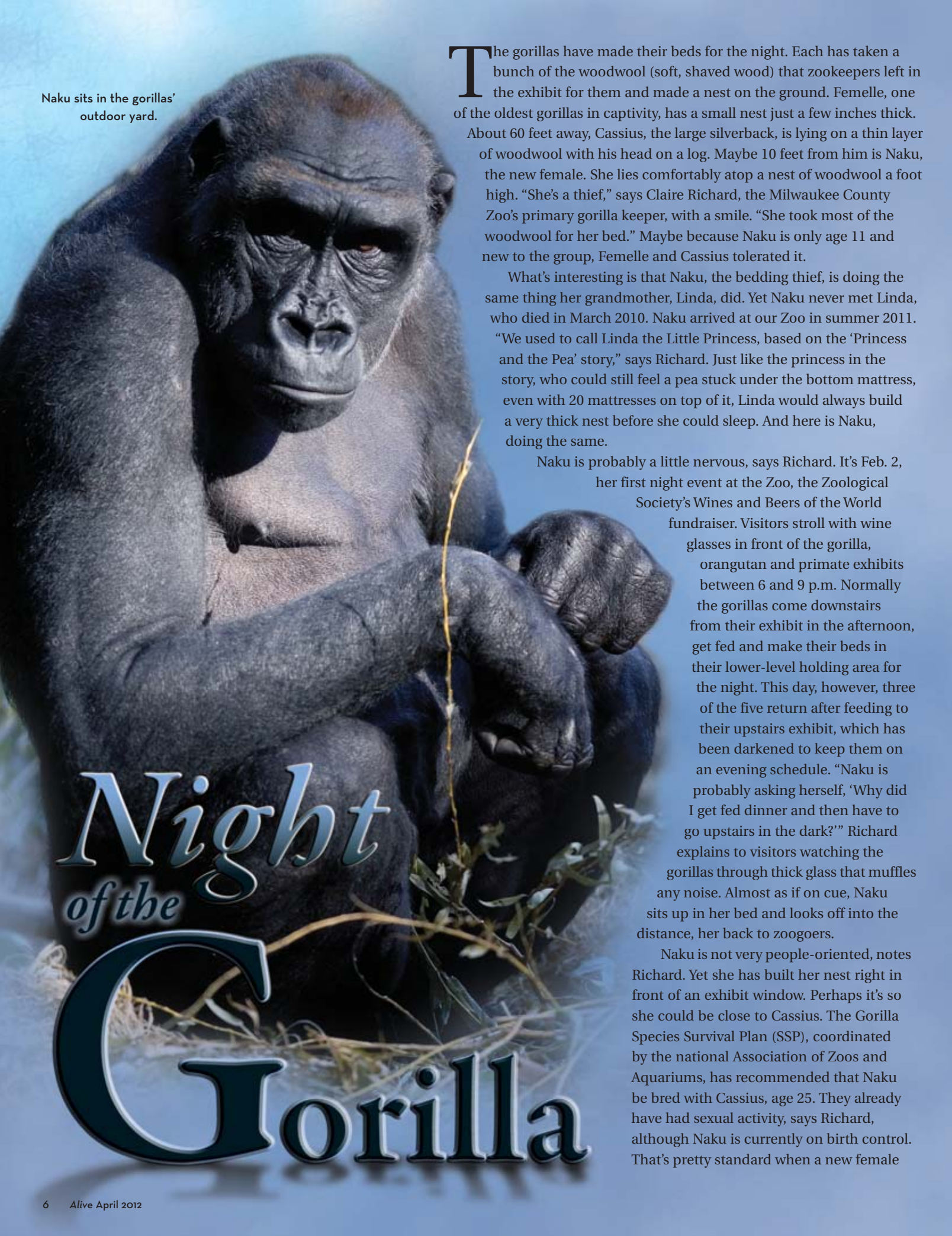
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ADVENTURE DINOSAUR!

sponsored by Sendik's Food Markets

MAY 26 - SEPT 3

Exhibit cost: \$2.50 in addition to Zoo admission



Naku sits in the gorillas' outdoor yard.

The gorillas have made their beds for the night. Each has taken a bunch of the woodwool (soft, shaved wood) that zookeepers left in the exhibit for them and made a nest on the ground. Femelle, one of the oldest gorillas in captivity, has a small nest just a few inches thick. About 60 feet away, Cassius, the large silverback, is lying on a thin layer of woodwool with his head on a log. Maybe 10 feet from him is Naku, the new female. She lies comfortably atop a nest of woodwool a foot high. "She's a thief," says Claire Richard, the Milwaukee County Zoo's primary gorilla keeper, with a smile. "She took most of the woodwool for her bed." Maybe because Naku is only age 11 and new to the group, Femelle and Cassius tolerated it.

What's interesting is that Naku, the bedding thief, is doing the same thing her grandmother, Linda, did. Yet Naku never met Linda, who died in March 2010. Naku arrived at our Zoo in summer 2011. "We used to call Linda the Little Princess, based on the 'Princess and the Pea' story," says Richard. Just like the princess in the story, who could still feel a pea stuck under the bottom mattress, even with 20 mattresses on top of it, Linda would always build a very thick nest before she could sleep. And here is Naku, doing the same.

Naku is probably a little nervous, says Richard. It's Feb. 2, her first night event at the Zoo, the Zoological Society's Wines and Beers of the World fundraiser. Visitors stroll with wine glasses in front of the gorilla, orangutan and primate exhibits between 6 and 9 p.m. Normally the gorillas come downstairs from their exhibit in the afternoon, get fed and make their beds in their lower-level holding area for the night. This day, however, three of the five return after feeding to their upstairs exhibit, which has been darkened to keep them on an evening schedule. "Naku is probably asking herself, 'Why did I get fed dinner and then have to go upstairs in the dark?'" Richard explains to visitors watching the gorillas through thick glass that muffles any noise. Almost as if on cue, Naku sits up in her bed and looks off into the distance, her back to zoogoers.

Naku is not very people-oriented, notes Richard. Yet she has built her nest right in front of an exhibit window. Perhaps it's so she could be close to Cassius. The Gorilla Species Survival Plan (SSP), coordinated by the national Association of Zoos and Aquariums, has recommended that Naku be bred with Cassius, age 25. They already have had sexual activity, says Richard, although Naku is currently on birth control. That's pretty standard when a new female

Night of the Gorilla

joins the group. “They want us to build up a rapport so that the keepers can get close to her. And she has to be trained to help in her own health care,” says Richard. “We will keep her on birth control at least a year so that if she does have a baby and there is a problem, she will be trained to present the baby so the veterinarians can examine it.”

The possibility of having a baby gorilla is exciting to staff and zoogoers alike. The Zoo has not had a successful gorilla birth in 20 years, although we’ve had baby gorillas (such as the famous Mandara) come here from other zoos. In 1992 Femelle gave birth to Mgbali, who lived almost six years but died in 1998. The reason for no births since then is that our three female gorillas were all older. In 2010, two of them died within 3½ months of each other: Linda (Naku’s grandmother) was 47 and Ngajji was 45. “Chances are Femelle, nearly 50, won’t hang around much longer,” says Richard, “because the longest lived gorilla in captivity is 55.” Now the Zoo will have two young, female gorillas. In addition to Naku, a 10-year-old from Toronto named Shalia is due to arrive this spring. Both will breed with Cassius.

What about our young males, Hodari, 17, and Maji Maji, 20? Just as in their wild habitat in the jungles of equatorial Africa, these western lowland gorilla males may not get mates. “They’re too genetically overrepresented in the captive-gorilla population,” says Richard, meaning that their mothers had many offspring. “Most likely they’ll be a bachelor group.” Making sure that gorillas are not “in-bred” with relatives, so that the captive population remains genetically healthy, is one of the goals of the Gorilla SSP. All of the great apes (gorillas, bonobos, orangutans and chimpanzees) are endangered. Almost all live in countries full of unrest, corruption, poaching, disease and habitat destruction. So zoos and other institutions are doing all they can to save these apes. Zoos also support research in the wild, and many zoo exhibits, like the gorilla and bonobo exhibits at our zoo, are designed to resemble an animal’s wild habitat (see page 22).

Even though all gorillas in captivity in the United States are western lowland gorillas, research on the western lowland gorilla has been limited compared to the mountain gorilla, writes Paul Raffaele, author of the 2010 book “Among the Great Apes: Adventures on the Trail of Our Closest Relatives.” This is partly because western lowland gorillas avoid humans, who have hunted them. Habitat also makes it hard for researchers to find these gorillas, writes Raffaele. “They live in dense forests where the visibility can be just a few yards and are semi-arboreal, spending part of each day high up in the trees out of researchers’ sight, snacking and snoozing. As a consequence, the western lowland gorillas are far harder to study than the mountain gorillas, who live most of their life on the ground and range each day over significantly smaller distances.”

At night, however, most gorillas nest on the ground. That’s why this Feb. 2 evening at the Zoo is such a treat, to watch three western lowland gorillas at rest. At first you think they’re sleeping,

but then Cassius, who at 400 pounds is about twice the size of the females, turns from his back to his side, with an eye on the exhibit window. Naku lies on her right side but then sits up. And Femelle is curled in a ball shape, but “every once in a while you’ll see the whites of her eyes and you know she’s not asleep,” says Richard.

In the morning, it will be back to work for Naku. Part of her training is getting used to new things. This night will help her prepare for the Zoo’s summer season, when animals are on exhibit



Naku snacks in a hammock made of fire hose.

for many evening events. “I have a whole basket of objects just to get her used to new things,” says Richard. “There’s a hairbrush, a toothbrush, a flashlight and a small PVC pipe with a shoestring tied to it so it looks like an ultrasound probe.” The other gorillas have been trained to sit still voluntarily for ultrasounds, both to check on their hearts and to check for pregnancies. Our Zoo is a pioneer in training gorillas to accept ultrasounds without anesthesia, which can be dangerous for them. So the training that Naku gets will be invaluable to monitoring that hoped-for pregnancy.

Meanwhile, says Richard, “she has just started to settle in and get comfortable with her new home and family.” Just like gorillas in the wild, which leave their natal groups to find mates once they become sexually mature, Naku left her birth family at Seattle’s Woodland Park Zoo to come to Milwaukee. With Shalia arriving soon, she’ll have another family member to adjust to. Given that both new females need a year on birth control and given that gorilla gestation is 8½ months, it will be at least two years before we might have that new gorilla baby.

By Paula Brookmire

Gateway to a New World

Imagine kids discovering a whole new play world outdoors. They can climb and run and explore...and still go back to the safety of their indoor home. That's what it was like last year for the Milwaukee County Zoo's bonobos. These endangered great apes act a lot like human children. So last April, when they discovered they could go outside into a new exhibit of mesh chutes, towers and playrooms, many of the bonobos were out in a flash. "Deidre, Viaje, Lody and Claudine bounded right out," says Barbara Bell, the primary bonobo keeper.

Of course, they had to go with their buddies. "They always went in groups of five to nine," notes Bell. "And every five minutes they would send someone back inside to make sure their home – their indoor area – was still there. They wanted to get reassurance from the zookeepers. So they did a lot of checking, running back and forth at first. They were like kids, venturing away from parents but always looking back to make sure they were there."

The new outdoor exhibit, made possible by a generous gift from an anonymous donor, ranges from 4 feet to 26 feet off the ground. Built in an old section of the Zoo's forest next to the Stearns Family Apes of Africa pavilion, the green mesh chutes give the bonobos the feel of being in the trees. High in the trees

is where they live most of the time in their native habitat, the African forests of the Congo River Basin in the Democratic Republic of Congo. Because the photos on these pages are close-ups of the bonobos in the chutes, the mesh enclosures may look like cages to some people. But the multiple units actually give the apes towers to climb, lots of space and a long runway. "They thoroughly enjoyed being able to flat out run and to have enough space to go almost into a full gallop," says Bell. "The other thing they really grooved on is...the higher the better. They loved the 26-foot-high towers."

Up in the towers, the bonobos could see children at about the same height in the Zoo's new ropes-climbing area nearby (see page 12). "They could see the Zoo's train from above. Of course, our guys love the train," says Bell. "They love to run with it. And the children on the train could wave at them from below." The bonobos' high-pitched squeals of delight were as loud as the train whistle (which they love).

In any group, however, some are more timid. Bell says that Ricky the bonobo was one of the last to venture into the new environment in the first few weeks. "He hasn't been here at the Zoo as long as the other bonobos, and he's a subordinate animal. He worries a lot," she explains. "The farther you get away from the building and into the chutes, the more different the building looks. You're kind of lost. And being lost is frightening. I think that's what happened to Ricky a few times. So we kept him close to home (his indoor area) or with a buddy."

The new bonobo outdoor mesh playground puts the apes up into tree level.



Now, though, the bonobos have had a year to get acquainted with their new playground. Zookeepers let them out in every season, winter included, unless it's so cold that keeping open a door to the outside would drain all the heat from their indoor area. "They'll go out even in snow," says Bell, despite the fact that their native habitat is one of sweltering heat. "They love snow and love to play with it."

In general, the bonobos can go outside or return back inside as they please. The chutes, which can be divided into smaller units, give keepers ways to "mix and match" bonobos as needed. "Every day we reconfigure the bonobo groupings into various sections of the chutes and playrooms," says Bell. "We might section off a pair for breeding. We have to deal with disabilities, such as age and cardiac problems. So we might keep an older bonobo away from the younger males, who often get into conflicts. We have 17 bonobos now. On any given day somebody's mad at somebody. Sometimes the males are incompatible. Sometimes the girls are bickering. The chutes system has been very user-friendly to us because we can cater to the animals' physical and psychological needs."

Bell especially likes the outdoor exhibit for the new experiences it provides the bonobos. "Climbing those towers had to be mind-blowing for some of them. You know, it's like when you get to the top of the mountain and see that there's something on the other side. You could see the sense of wonder. They would lie on their backs in the towers and just stare. They spent a lot of time just looking, looking."

By Paula Brookmire



K2, a bonobo baby boy, can now see human children climbing ropes at the Zoo.

Laura the bonobo lies flat looking up at her new world in the outdoor exhibit.



Bonobos Deidre (left) and Claudine play among the trees.

How Apes Think



Dr. Stephanie Bogart, Barbara Bell and Jennifer Schaeffer discuss bonobo research at the Milwaukee County Zoo.

Do you think human 2-year-olds are smarter than great apes? Some scientists do. They believe young human children are smarter in every way than apes. Other scientists are challenging that idea.

The Milwaukee County Zoo has become a hot research site for this topic, thanks to its 17-member bonobo group and smaller groups of gorillas and orangutans. One researcher called the Zoo a “gold mine” because it has a large group of bonobos that have been trained to interact with keepers and help in their own healthcare. Bonobos are closer to humans genetically than gorillas and orangutans.

The bigger question behind the research is: How do we think? Or, how do we – apes and humans – develop thinking (cognition)? Dr. Sally Boysen, a psychology professor at Ohio State University in Columbus, Ohio, has been studying great apes for a quarter-century to answer these questions: “What were the reasons that humans developed language and tool use and higher cognition? No one knows. So we have to do this backward detective work to get the answers. The closest species that we see having humanlike cognitive ability are the great apes.” She and other ape-cognition researchers, such as Jennifer Schaeffer and Dr. Stephanie Bogart from Emory University in Atlanta, are studying great apes at our Zoo and other locations.

“Part of the model is to try to replicate the early studies done with young children,” says Dr. Boysen. “These are non-verbal and non-linguistically based studies. For example, human infants, before they’re 1 year old or so, you can cover a toy with a blanket,



Dr. Sally Boysen

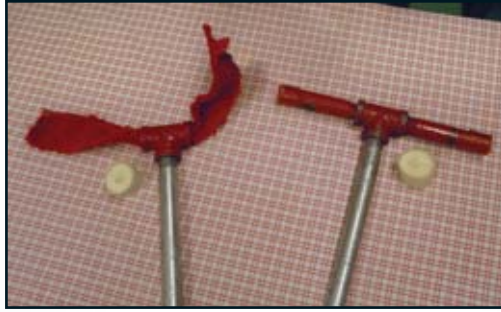
and it’s gone. In their mind, it’s gone.” This is called not having a concept of “object permanence.” In human children, starting about age 1, they begin to recognize that an object is there even if it is covered up. So the question is: Do other animals have the notion of object permanence?

One experiment to test for this involves three cups and a food treat such as a grape. Researchers start with getting the apes used to the idea of looking for food under the cups. Then researchers put three cups on a flat board that can be moved. A grape goes under one of the three cups. Then the whole board, with cups, is rotated. “Then we ask a bonobo to pick a cup. The bonobo is always looking for the food treat,” says Schaeffer, a research specialist in the laboratory of Dr. William D. Hopkins at Yerkes National Primate Research Center at Emory University. “Some are fabulous at it,” says Schaeffer. “Some are terrible.” The next part of the test, called a transposition test, looks a little bit like the old shell game where you put a coin under one of three shells, or cups, and move the shells around to see if the viewer can recall which shell the coin is under. “We put food under one cup. Then we switch placement of the cups without the bonobo seeing the food moving,” says Schaeffer. The bonobo then tries to pick the cup with the food.

In a 2007 paper published in “Science” magazine, researchers did the same battery of cognition tests on human children at about age 2½, on orangutans, and on chimpanzees, which are about as close genetically to humans as bonobos are. If humans are just smarter overall, you’d think they would do better on all the tests. The surprise? Although children did better than chimpanzees at the object-permanence test, chimps outperformed children on the switch-the-cups test (transposition). In fact, that large study tested for the idea that there are two types of thinking, or cognition: physical, which deals with objects that don’t move (such as fruit in a forest), and social cognition, which deals with creatures that move and the social interactions among them. Guess what? When researchers averaged all the physical-thinking tests, humans and chimps did equally well (orangutans scored lower). In the social-thinking area, however, “the humans were more skillful than either of the two ape species,” say the authors, led by Dr. Esther Herrmann of the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany.



When you hide a grape under a cup and move the cups, can a bonobo pick the cup with the grape?



Which will work as a rake? Bonobos must decide.



Which side of the "rake" will get the ape a banana treat?

Since 2007 Dr. Boysen has been doing some of these same tests at our Zoo, and the Emory University researchers have been coming here since summer 2010.

Things don't always go smoothly when working with smart apes. Take one example from the tool-use test, with a "rake." Based on some other experiments, Dr. Boysen designed a T-shaped rake made from 1-inch-diameter wooden dowels. The goal was to try different tests to see if the bonobos could figure out how to use the rake to get a piece of banana. In her first try last October with Viaje the bonobo, she says, "He took the wooden rake, stomped on it, broke it in half and then demolished it." So off to the store went Dr. Boysen to get stronger stuff: metal pipes. "I spent \$100 on pipe to remake the tool to be Viaje-proof. I have to be a jack of all trades," she adds. The pipe rake worked fine with other bonobos. But Viaje pulled the T-shaped pipe rake up next to the wire mesh of his enclosure and held onto it so tight that Dr. Boysen could not get it back. So she left him alone for 20 minutes.

"Bonobos really like attention," says the Zoo's primary bonobo keeper Barbara Bell. It's completely voluntary for them to participate in the research. "They like to learn, and they're always excited to see the researchers. So it's a disappointment to withdraw your presence." Finally, when Dr. Boysen came back to Viaje, he wanted to participate. So he left the pipe free for her to take back and repeat the experiment.

The next step was to give each animal a choice of two rakes: the T-shaped rake with a red pipe at the end *and* a pipe with just a red cloth at the end (see photo). Each animal got to touch the cloth to see that it was not hard. "The goal," says Dr. Boysen, "is to see if the animal understands that the cloth-topped pipe can't be used to rake in the banana treat." Step No. 3 was to use a hybrid rake, with one side of the T-bar a hard red pipe and the other side a soft red cloth. The animal has to choose the correct side to use as a rake or it will not get the banana treat. "About 90% of bonobos understood that the hard side of the rake was the side to use in getting the banana," says Dr. Boysen.

The cognition tests that the researchers perform get more complicated as they progress. For example, with the food-under-the-cup test, an advanced version is to have one researcher put a banana piece under a cup, out of reach of the bonobo, and then leave the room. Then a different researcher enters the room.

The second researcher does not know which cup has the food. "The bonobo has to gesture or make some other indication toward the right cup to get the food," says Jennifer Schaeffer. "Frankly, Zoo animals are not as good at this as primate research animals are." Even though our Zoo's bonobos are more "schooling," they are also more socialized, and more polite, explains zookeeper Bell. "It's rude to beg. We don't reinforce it. So our bonobos just sit politely [and don't always point to the banana]."

The research on ape thinking has more than one goal, notes Dr. Boysen. "I think the more we demonstrate ape intelligence, the more likely the public will become aware of what we need to do to save apes in their natural habitats."

Note: For more information about ape-cognition research at our Zoo, go to www.zoosociety.org/aperearch.

By Paula Brookmire



Viaje the bonobo



Before the train ride starts, Nathan Inyang (left), 4, of Bayside and Kalena Dorgan, 5, of Brown Deer, peek out the back. Once the North Shore Bank Safari Train starts, riders need to keep hands and heads inside.

The Penzeys Spices Carousel at the Zoo lets children ride their favorite animals.

Take a Ride at the Zoo

As you count down – 3, 2, 1 – and push off from the wooden platform, you feel your heart stop for just a second. But it's a long second. You're hanging in midair. The fear passes as you feel the tug of your harness and continue zipping above the Milwaukee County Zoo landscape. Below, faces stare up at you in both envy and awe. You're on the Zoo's zip line, one of the most exhilarating Zoo amusements. These "added attractions," whether you're clinging to a harness or to the hair of a camel, provide a view of the Zoo and its animals from a whole new angle. So, when the Zoo's warm-weather season starts next month, take a ride.*

Zip 'n Glide

With 500 feet of zipping line, you can coast your way from the Humboldt penguins to the picnic area and back. The thrill is part

of the Zoo's new Sky Trail® Wisconsin Adventure Zone, which also includes a rock-climbing wall and ropes course, all sponsored by Tri City National Bank. "It felt like I was flying," says zoogoer Luke Haines, 7, who took his first zip line ride in October 2011. His dad, Ryan, was right behind him. "It's an experience you can't get in too many places," Ryan says. "It's adventurous, but you don't go too fast." And don't let a fear of heights or flying stop you. "The staff clearly knows what they're doing," Ryan says. "The equipment is new (the zip line opened last August). You're very safe in the harness." Looking for a tamer ride? Take in the beauty of the Zoo from a bird's-eye view as you float in midair on the Zoo's Sky Safari. This sky glider propels you above the camels, rhinos and moose. Keep an eye out for their humps, horns and antlers as you sail over each exhibit.



Zoom 'n Scoot

For a Zoo safari much closer to the ground, hop aboard the Zoomobile, sponsored by PNC Bank (see page 15). This 25-minute guided tour steers zoogoers right alongside Zoo exhibits, offering a front-row seat to see animals in action. And with interesting animal facts woven into the tour, the open-air tram trek provides an efficient and educational overview of the Zoo. If you

Seeing the Zoo from above are Kat Mazang, of Milwaukee, and daughters Sara (left), 5, and Kat, 8, as they ride the Sky Safari glider.

prefer traveling by train, ride the rails of the North Shore Bank Safari Train into the back country of the Zoo (see page 14 for more on trains). Look for wild birds and squirrels, swans and caribou. Then wave to the Alaskan brown bears, kangaroos and emus as you push full steam ahead past their exhibits.

Saddle up 'n Giddyap

Experience the Zoo right with the animals. Ride Charlie, a kid-friendly Bactrian camel who likes to cuddle. See the world through his eyes as you tower more than 7 feet off the ground sandwiched between his two humps. Soft in both nature and texture, Charlie will gently lead you and your little ones along the camel ride trail. Young zoogoers can also grab the reins of a Zoo pony. The children's pony ride, located near the Sky Safari entrance, introduces kids to new four-legged friends as they parade around the pony ring. Parents can walk beside the child on the pony or stand back to see the smiles and listen to the laughs. If your child isn't quite ready for real Zoo animals, take a spin on the carousel, sponsored by Penzeys Spices. From tigers to zebras and swans to ostriches, you can take a milder ride on your favorite wild animal figures.

By Erica Breunlin

*Rides are seasonal: The Sky Safari, North Shore Bank Safari Train, Penzeys Spices Carousel, PNC Bank Zoomobile, and Tri City National Bank zip line (which is part of the Sky Trail® Wisconsin Adventure Zone) are open May-October, weather permitting. Zoogoers can take camel rides or pony rides Memorial Day Weekend through Labor Day. Prices: See the Zoo's information guide and map.

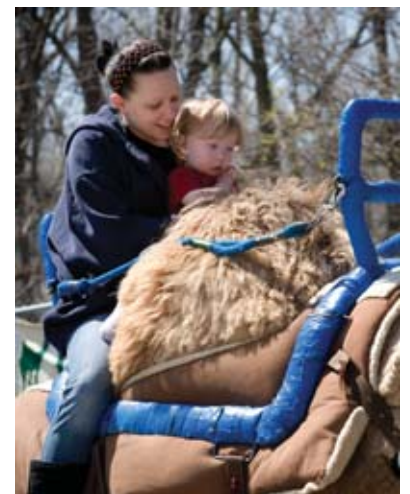


Luke Haines, 7, of Menomonee Falls, tried the zip line in fall 2011.



Mike Nepper photo

A zoogoer takes off from the landing platform with the help of an attendant and spreads her wings on the Zoo's zip line ride.



Jessica Boling of Fox Lake, Ill., and her son, Nolan, ride Charlie the friendly camel.

Take a relaxing ride on the PNC Bank Zoomobile for a guided Zoo tour featuring animals such as elephants Brittany and Ruth.

RARE TRAINS, RARE TALENTS

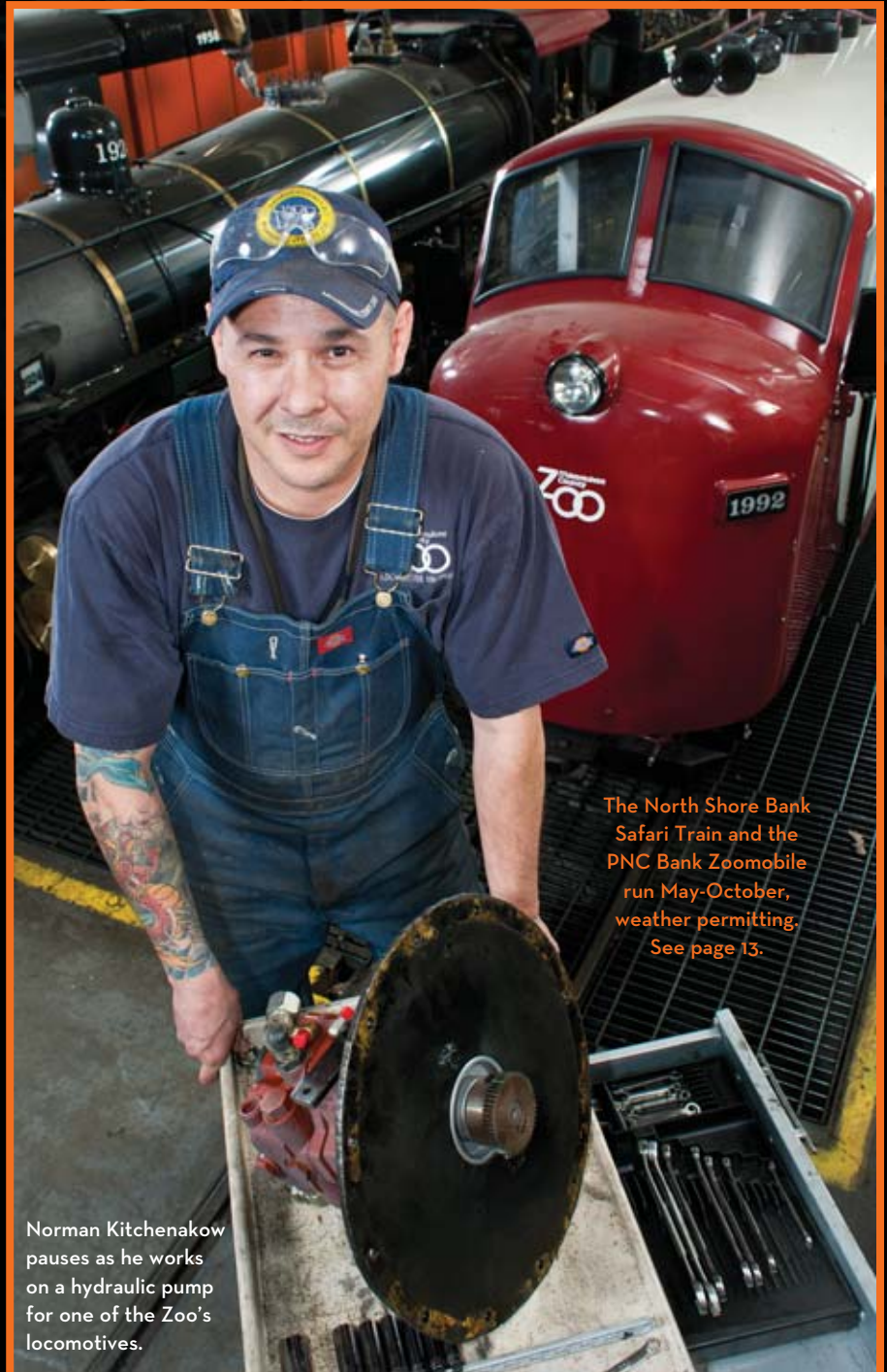
What do whooping cranes and steam locomotive trains have in common? Not much, except that in the early 1900s both were easy to locate in Wisconsin and today both are exceedingly rare. Yet just as the Milwaukee County Zoo is home to two endangered whooping cranes, it's also home to two fully functional steam locomotives. In fact, the Zoo is one of only a few places in Wisconsin that has operating steam trains.

And the reason they're still in operation is a testament to the rare talents and skills of Ken Ristow and Norman Kitchenakow, the Zoo's locomotive engineers. "I love the smell of coal smoke. I love the smell of steam," says Ristow, who has worked on all four of the Zoo's trains (including two diesel-powered engines) for 13 years. "I love the steams because they're historically significant." Kitchenakow also operates and appreciates the steam locomotives, but he calls himself "more of a diesel guy." Both Ristow, 40, and Kitchenakow, 38, have fond memories of riding the Zoo's trains as children – as so many people do. The train was the Zoo's first attraction on its current campus; it was operating with a diesel engine in 1958, while animal buildings were still under construction and before the Zoo officially opened in 1961. Since then, it has had an estimated 17.4 million riders.

As kids, neither Kitchenakow nor Ristow imagined he'd be in the engineer's seat decades later. Yet Ristow always liked trains. "It was something my dad got me into. As I got older I became fascinated with the technology behind them." His interest drew him to volunteer at the Mid-Century Railway Museum in North Freedom, Wis. There, he learned about steam locomotive technology and eventually became an instructor. He also applied for and received a train engineer's license. This in turn allowed him to operate the Soo Line 1003, a restored steam locomotive used for tourist excursions and now housed in the Wisconsin Auto Museum in Hartford, where it is being rebuilt for future operation. Ristow also operated the Nickel Plate 765, which still runs and is based in Fort Wayne, Ind. When a full-time position for a locomotive engineer opened up at the Milwaukee County Zoo, Ristow applied and was hired in 1999. Kitchenakow's passion is not so much for locomotives as for "tinkering." An all-around handyman, Kitchenakow does everything from snow removal to fixing exhibits. He worked at the Zoo from 1989 to 1994 and returned in 2007, always operating and maintaining the trains along with other tasks. In 2009 he got the official title of locomotive engineer.

Although they are one-quarter the size of a regular train engine, the Zoo's four locomotives

operate under the same mechanical principles as their full-size counterparts. The difference between diesel engines and steam engines, however, is like night and day. "Steam is a lot more difficult to operate than diesel," says Kitchenakow. "Operating the diesels is like running a lawn mower." But operating a steam engine requires precise balance of heat and water to maintain steam pressure. It starts with a fire in the engine's firebox, which then boils water and creates steam. "The expansive force of the steam pressure is what powers the piston," says Ristow. The piston transmits power through a main rod to a crank on the driving wheel, and that's



The North Shore Bank Safari Train and the PNC Bank Zoomobile run May-October, weather permitting. See page 13.

Norman Kitchenakow pauses as he works on a hydraulic pump for one of the Zoo's locomotives.



Clockwise from top: **1.** Ken Ristow tightens a sand pipe on the 1924 Pacific Class locomotive, which arrived at the Zoo in 1977. **2.** Ken Ristow's knee sticks out the side of the 1916 Atlantic Class locomotive at the Zoo. The locomotive engineer is 6-foot-5. **3.** Norman Kitchenakow (not in view) operates the 1916 Atlantic Class locomotive on a nice summer's day.

Rick Heinlein photo

what makes the train move. The coal-fed fire must be kept at the correct temperature and there must always be enough water in the locomotive's boiler. In the Zoo's summer season, steam locomotives use, on average, 250 gallons of water a day and burn about 200 pounds of coal. A full-size steam engine needs two people to operate it: the engineer to drive and the fireman to shovel coal into the fire. A Zoo train engineer has to do both jobs simultaneously.

When you enter the Train Shop at the Zoo, your nose is immediately filled with the familiar scent of a garage: a mixture of grease, oil, shaved metal parts, lubricants and other industrial materials. Although checklists, tools and various materials are neatly organized, maintaining the Zoo's trains is a messy job. And not many things are messier than cleaning a steam engine. "The first thing we do is clean the ashes out of the engine from the previous day's use," says Ristow. "We get pretty dirty." The coal, which is shipped in from West Virginia, also ensures that hands and clothes won't remain clean for long.

Three of the Zoo's locomotives were manufactured by the now-defunct Sandley Light Railway Equipment Works, Inc. That means Ristow and Kitchenakow have to fabricate a lot of the parts they need. The first steam engine arrived in late 1961 or early 1962 (called the 1916 Atlantic Class locomotive), followed by another one in 1977 (the 1924 Pacific Class locomotive). A private individual

built the fourth engine (a diesel), which arrived in 1992. Despite the old age of three of the trains, Kitchenakow says they run better now than when they were originally manufactured, thanks to his and Ristow's handiwork. These priceless trains have to be in top condition because a particular engine can travel an estimated 2,000 to 6,000 miles per year. And it would take at least three-quarters of a million dollars to replace them, notes Karl Hackbarth, Zoo operations coordinator. But working on them is not easy because the components are so small and can be hard to reach. Ristow is 6-foot-5. The toughest part of the job for him is squeezing into the trains' smaller cabs (with his bent leg sticking out) for hours on end. The job is physically demanding in other ways. "You have to lift a lot of coal and you're out in the elements," says Kitchenakow. "The heat can be a huge factor during the summer if you're running a steam engine."

But Ristow and Kitchenakow love their jobs. "I'm lucky that my train hobby is also my livelihood," says Ristow. Both enjoy working with each other in the Train Shop and with other Zoo employees. Kitchenakow says he also likes the attention he gets from his excited, youthful passengers. "The kids act like we're heroes," he says. One time, Kitchenakow really was a hero, at least for a turtle. "I spotted a turtle on the train tracks. I hit the brakes and stopped the train. I got out, took the turtle off the tracks and put it in a safe place. The kids started cheering."

By Zak Mazur

Cleaner & Greener Zoomobiles

Electric-gas hybrid autos are impressive, but when it comes to being "green," they can't touch the 100 percent-battery-powered Zoomobiles, sponsored by PNC Bank. Phased into full-time operation near the end of the Milwaukee County Zoo's 2010 summer season, the new tour vehicles (see photo) are "clean, quiet and powerful" says Mike Garcia, the Zoo's admissions and transportation supervisor. "I pushed to replace the old Zoomobiles for years," he adds. The reasons: maintenance costs ranged from \$25,000 to \$35,000 annually, it became difficult to find spare parts, and newer technologies promised cleaner, quieter and more cost-effective alternatives.

The original Zoomobiles were built specifically for the Zoo by Allis-Chalmers Manufacturing Co. in 1964. "They ran on gasoline," says Karl Hackbarth, Zoo operations manager. "They operated at low speeds and carbon built up in the engines, creating smoke and requiring constant cleaning." They were also loud, making it difficult for riders to hear the driver. By the early 1980s the engines were modified to run on clean-burning propane, but propane lacked the horsepower to get up the hill near the Small Mammals Building.

Garcia researched the pros and cons of diesel, gasoline, propane and electric power. He determined that electric would be the most efficient. Once funds were obtained, Garcia contracted with Yes Equipment & Services in Menomonee Falls to build three battery-powered engines and three "strings" (a line of three passenger coaches) for \$320,000. The new Zoomobiles outperform the old ones in every category: annual maintenance is between \$1,500 and \$2,000, they're ultra-quiet and clean, they offer plenty of horsepower and an overnight charge can power the vehicle for three days. "Drivers and passengers say the new Zoomobiles are better," says Garcia.



By Zak Mazur

Kids Alive

Animal Parts

How do animals use their bodies?

Could an elephant drink water without its trunk? Could a red panda climb trees without its claws? Could a penguin swim without its flippers? Do these animals really need special parts on their bodies to do things? The answer is yes. Animals use their body parts to help them survive in the world. Imagine if an elephant didn't have its long trunk to help with day-to-day tasks. How would it put food or water into its mouth without the special moveable parts at the end of its trunk that help it pick things up? Learn about different animal body parts by doing the activities on these pages. Then visit our Web site, zoosociety.org/funstuff, for answers and more activities.

F	Q	H	K	V	S	H	N	T	Z	F
L	E	O	E	H	C	G	A	Q	E	E
I	A	R	O	U	B	I	N	A	W	L
P	R	N	O	A	L	B	T	Z	T	O
P	T	P	C	X	A	H	L	S	R	U
E	C	V	T	G	E	O	A	P	U	S
R	S	X	K	R	B	T	G	O	X	G
S	P	Y	S	J	L	E	N	T	B	N
Z	K	N	U	R	T	G	A	N	M	I
U	C	L	A	W	S	C	F	K	I	W

Anatomy Word Search

Animals have special parts that help them do things like eating, digging and protecting their young. Below is a list of some of these parts. Use your special opposable thumbs and fingers to circle these words in the word search. Words can be found vertically, horizontally, diagonally and backward.

- | | |
|----------|-------|
| BEAK | HORN |
| CLAWS | POUCH |
| EAR | SPOT |
| FANG | TAIL |
| FEATHERS | TRUNK |
| FLIPPERS | WINGS |

Function Fill-in

How do these animals use these body parts? Fill in the blanks with as many answers as possible.

1. A polar bear uses its **front paws and back legs** to _____.
2. A kangaroo uses its **pouch** to _____.
3. A rattlesnake uses its **fangs** to _____.
4. A bonobo uses its **hands and feet** to _____.

Guess Who?

Identify these animals by their body part. Then write down what the close-up body part does for the animal. Answers are at www.zoosociety.org/funstuff.

Note: If the animal is a bird, write the *type* of bird.

1 animal:

body part purpose:

2

3

4

5

8

5

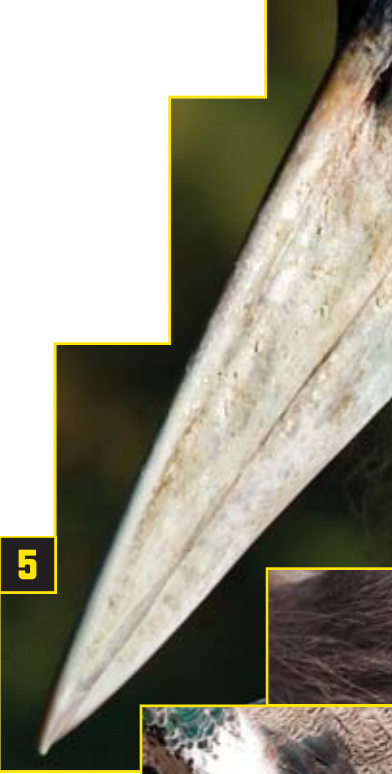
6

7

8

10

8



Ralph Durham

Julie Cheng

Ralph Durham

Ralph Durham

Ralph Durham



Why We Love

Teaching at the Zoo



Kristin Ziarnik leads a Little Love Bugs class.

“Where else can you talk about a jaguar and then actually see one?” says Heather Thomack. Her enthusiasm for teaching at the Milwaukee County Zoo reflects that of all the Zoological Society of Milwaukee (ZSM) instructors. They love it here. The animals are close by, sometimes even in the classroom. Instructors write curriculum and create colorful classrooms that immerse children in topics from rabbits to animal healthcare. They don’t have to issue grades. They let children choose some of their own activities and learn at their own pace. Parents or grandparents can come to classes for younger children. “The parents often are surprised,” says James Mills, director of the ZSM’s Conservation Education Department. “Our classes surpass their expectations. They say they would have started taking classes earlier, if they had only known. Parent and grandparents can’t wait for a younger child to reach age 2 so that they can attend several more years of programming.” ZSM classes range from age 2 to 14. Classes develop a child’s natural curiosity about animals into an “ecological understanding,” says Mills, of how animals, plants and humans are interdependent. Adds instructor Chris Uitz: “Classes at the Zoo put children in a place where their imagination and curiosity come pouring out.” Read on for fun examples of how we teach and how children learn here at the Zoo. **If you want to get in on the fun, check our Web site: zoosociety.education. Zoological Society classes or summer camps are held nearly year-round.**

Fun in learning

I remember overhearing a girl say to her parent after class, “We had a thousand pieces of fun today!” It always reminds me of how important it is to make each educational moment fun. We constantly challenge ourselves to improve our classes and make activities that are hands-on and interactive. The child didn’t even realize she was learning at the same time she was “playing.”

– instructor *MaryLynn Conter Strack*

How kids learn

When teaching nearly 300 children each month, I am lucky to be a part of many “eye-opening” moments. A favorite example: I was teaching the concept of mammals in an Apes and Monkeys class for 3-year-olds. A simple way to classify mammals is to say they are animals that have hair or fur on their body. We identify apes and monkeys as mammals. Then we ask the children: Are you a mammal? We mess up the hair on the top of our head while saying, “I’m a mammal.” One boy said his dad was *not* a mammal. Why not? “Because he is bald,” he said. Taking this opportunity as a teachable moment, we immediately checked to see if he could find hair anywhere else on his dad; there was hair on his legs and arms. So we could classify Dad as a mammal, too! It was great to witness the thought process that went through the boy’s head at only 3 years old, connecting what he learned to his everyday life.

– instructor *Kristin Ziarnik*

How ZSM classes teach problem-solving

We encompass the whole child when teaching classes and writing curricula, and I think that is the reason we make such strong connections to children. One of my favorite experiences has been watching a child work through a difficult moment and seeing how proud he or she was of the achievement. I teach animal-related art classes. When children envision the art they want to create and make a mistake related to their artwork, their first reaction is to be emotional and upset. Before a project, we point out that a mistake is an opportunity to create something new in their artwork. If you make a mistake, we tell them to stop, step back, look at their project and decide how to turn the mistake into a part of their picture.

I have watched children do this hundreds of times, and it is amazing to see them learn how to take an emotion, feel it and then constructively express a way to problem-solve. – *Patty Trinko, assistant director of the ZSM Conservation Education Department*

How ZSM classes teach 2-year-olds

People would ask me, “What can a 2-year-old learn about animals?” It’s actually quite amazing what a young child can learn. She learns what a frog eats because she remembers jumping for “flies” while wearing a frog costume. He learns that milk comes from cows because he “milked” a fake cow. They learn that birds hatch out of eggs because they sat in a giant nest and pretended to do just that. – *MaryLynn Conter Strack*

How ZSM classes inspire

I hire interns to work in our summer camps program. During an interview last year an intern applicant said that she had attended Zoo classes since she was 3 years old, which influenced what she wanted to do for a living. She wanted to be a zookeeper. It was amazing to hear someone who was now in her early 20s remember how inspired she was by something we had taught her years ago. – *Patty Trinko*

How classes “awaken” something within

There is a time during many classes for ages 2 and 3 when the children and their adults make an animal costume together. It is fun to watch them. Afterward, we bring out a special full-length mirror so the children can see themselves as the animal. It’s so interesting to witness their reaction to that first glance at their reflection, everything from smiles and laughter to quiet amazement.

– *instructor Molly Del Vecchio*

Teaching 3-year-olds

A grandmother told me about how her granddaughter taught her Sunday school class everything she had learned in my bat class here at the Zoo for 3-year-olds (with an adult). She picked up Stellaluna (a plush-toy bat from a children’s story) and started to teach about the body

parts of the bat. She explained how bats have four fingers and a thumb (bones in the bat’s wing), along with what they ate, when they hunted for food and that they were mammals. The grandmother said the girl practically repeated my entire introduction about bats. It was at that moment that the grandmother saw how much her granddaughter had learned. The grandmother continued bringing her to class every month for several years. – *Patty Trinko*

Why teaching at the Zoo is different

- A unique difference for me is teaching children alongside their grown-ups. – *Kristin Ziarnik*
- I feel that students who tend to struggle in a school classroom setting tend to excel in our Zoo classroom. – *instructor Rynne Lee*



Heather Thomack shows a live turtle to students.



James Mills

- Classes at the Zoo give a child an opportunity to learn about animals and related science topics in a hands-on environment. If there is something we can't bring to the class, we have the whole Zoo to use as a resource.

– *instructor Michelle Bublitz*

- By working in an informal education setting, I am not required to place the same emphasis on assessment. That allows students to engage in their learning in a different way. – *Kristin Ziarnik*



Chris Uitz leads a Zoo tour.

Challenges of Zoo classes

One of the biggest challenges is breaking through the perception that we can bring any animal in the Zoo to our classrooms or to schools. We have many programs that we take into schools. I often joke with children that I can't bring an elephant to school because an elephant can't buckle its seat belt in the car. We don't have the capability of bringing rare or large animals into schools. For safety reasons, we use only the Zoo's “education animals,” such as hedgehogs, chinchillas, rabbits, fruit bats, snakes and small owls. Children are excited about the animals we bring.

– *instructor Chris Uitz*



Sue Weis with a turtle artifact

Continued on page 20

Favorite Topic to Teach

I like teaching something new or different. Examples: Until people come to turkey class, they have no idea that turkeys can fly at more than 55 miles per hour or that a turkey chick is called a “poult.” Until they see a bat up close, they may not realize it has fur. Until they touch a turtle, they don’t know it has 13 scutes on its back. – *instructor Emily Artin*

Conquering a fear of animals

One mom was afraid of bats and did not want to pass on her fear to her 3-year-old daughter. So she decided to take the girl to my bats class at the Zoo. She told me in advance that her own mom was afraid of bats and never took her into the Zoo’s Small Mammals Building, which houses bats. When I saw her at the door, I talked to her about what was going to happen in the class and how to handle it so she did not pass on her fear to her daughter. Near the end of class, we went behind the scenes to see a fruit bat close up. I let the mom stand with me at the back. Mom held her composure even though she was terrified. After dismissing the class, I asked the zookeeper if she would let this mom see the bat again so she could work on her fear. The zookeeper agreed and spent some time gently acclimating the mom to the fruit bat. It was impressive to see the mom slowly open herself to this animal. At the end, her daughter thought that bats were “the best animals ever.” The mom thanked me over and over. It was a truly beautiful moment to see a parent care so much for her daughter that she was willing to face her own fear. I loved helping her move through fear into a place of acceptance. – *Patty Trinko*

Conquering fear of class

While teaching the Turtles class to 2-year-olds, I saw a dad and son who were at Zoo class for the first time and were nervous. The boy was hiding behind his father’s legs. Our classes have a variety of learning stations, and I told them they could choose any activity

that interested them. This also gave them the chance to observe what others were doing and to slowly, and on their own terms, warm up to the class. Soon they were at the painting station and then playing with others at the sand/water table. When it was time for the movement portion of the class, I was amazed to see them both *fully* participating with the group, pretending to be turtles tucking in and out of their shells while smiling and laughing at each other! It left quite an impression on me that within an hour’s time this reluctant parent/child duo had not only learned something about turtles, but also had worked through their own doubts together – and were having fun! – *Molly Del Vecchio*

Using animal artifacts

The education department has plenty of animal skulls, fur, mounted fish, bones and other animal artifacts. These make great teaching aids because they show children the structures of an animal. – *instructor Sue Weis*

Bringing life experience

Having traveled to Africa, I am able to add personal experiences to classes. Also, I have worked in several nature-center education programs with a wide array of animals, including wolves and raptors. – *Ryanne Lee*

Unexpected lessons

Sometimes it’s the things we don’t even know we’re teaching that make a big impression. In our child-only classes before going on tour in the Zoo, we always review with the children what to do if they get lost. We tell them to “super-glue” their feet to the ground and stay there until the teacher comes to get them. A parent told us this story about her boy who had attended our classes: On a family vacation to Disney World, the boy got separated from the parents. The frantic parents re-traced their steps and found the boy exactly where they last saw him. They hugged him and asked, “How did you know to stay here?” He said, “I super-glued my feet, like at Zoo class.” – *MaryLynn Conter Strack*



Patty Trinko teaches an art class.

In a class for 2-year-olds, MaryLynn Conter Strack shows a rabbit.

Puppets Lend a Hand

There are 67 new “teachers” at the Milwaukee County Zoo. They’re actually puppets. They probably should be called “teaching aids,” but they’re so lifelike. These animal puppets are bringing to life the science of animals for children in Zoological Society of Milwaukee (ZSM) education classes. “Puppets can be instrumental in introducing students to the big ideas of environmental science: cycles, biomes, predator-prey interactions and much more,” says Jeff Anderson, a Milwaukee Public Schools mentor and educator who has used puppets in his classrooms for 25 years. Last fall he donated to the ZSM 67 Folkmanis-brand animal puppets from his large collection.

Folkmanis puppets are designed to represent animals realistically, using the animal’s natural coloring; no purple elephants or blue tigers here! The hand puppets are constructed of plush fabric and stuffing with fur, velour, and silkscreen details, and range in size from 8 inches to almost 2 feet long. The donated puppets span many species, from a giraffe to an orangutan, a lobster to an owl. Anderson started with his first puppet in 1985, his second year of teaching, to introduce amphibians and metamorphosis to high school students. He used a frog puppet (made by his wife, Melody) that had limbs and a tail that could be attached and detached with Velcro. This allowed him to show how a tadpole, which looks like a fish, changes into a frog, which is an amphibian. His students responded so positively that puppets became a staple in his classes.

Anderson’s high school students at MPS developed literacy and communication skills by writing environmental plays and performing them with puppets. They also used puppets as anatomical models in dissection discussions, and to understand food chains. Anderson notes that puppets may improve social skills as well, “allowing the personalities of students to emerge in non-threatening ways. I remember not recognizing a voice during a puppet performance and glancing behind our stage to see a Hmong student who had never spoken in class before doing a perfectly acceptable chicken voice.”

Various types of puppets have been used in ZSM classes over the years. “Puppets are very useful tools to help us foster a child’s sense of empathy for an animal,” says James Mills, the ZSM’s director of conservation education. Adds assistant director Patty Trinko: “Often a puppet will be used to break the ‘fear’ barrier. For example, using a snake or chameleon puppet to talk to children about animal body parts makes the reptile feel more accessible and less ‘scary.’” Even when a class has a live animal, such as a turtle, in the room, a puppet can help act out animal behavior.

“In the Turtles class for 2-year-olds,” says instructor MaryLynn Conter Strack, “we use a turtle puppet to show how a turtle can hide in its shell. Our live turtle is very used to people and doesn’t ‘hide’ on command. The puppet draws the children’s attention as they watch it intently for the next time it will ‘hide.’”

The Folkmanis puppets made their Zoo debut in March in the Junior Vet class for children ages 4 and 5. “Children and adults could manipulate puppets to blink, open their mouth, rotate the head and so forth, allowing their creativity and imagination to go more in depth when acting out the roles of veterinarians,” says ZSM instructor Kristin Ziarnik. The puppets will play a role in many Zoological Society early childhood classes throughout the year, highlighting anatomy and matching animals to their habitats, says Ziarnik. Adds fellow instructor Sue Weis: Puppets also help communicate rules or ideas. A mouse puppet can remind children to be “quiet as a mouse” when they need to listen. “Puppets bring a subject or story to life,” says Weis. “They are an extremely valuable tool, and I am so thankful we have them.”

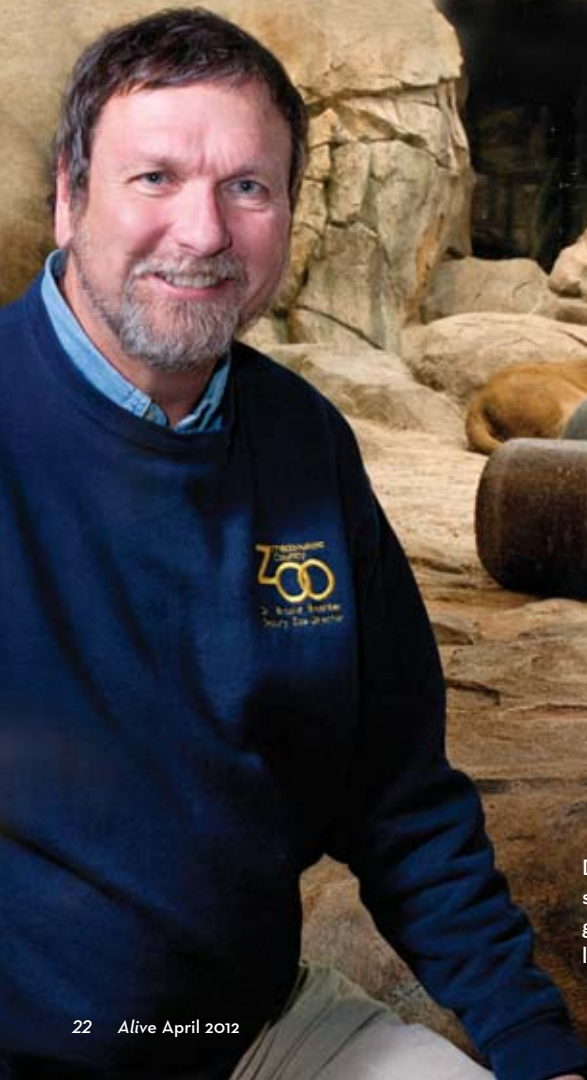
By Liz Mauritz



Above: Jeff Anderson and some of the 67 puppets he donated (clockwise from red lobster): baboon, sea lion, tiger, hippo, orangutan and great horned owl. Zoological Society instructor Kristin Ziarnik animates a moose puppet.

Animal Exhibits

More than Meets the Eye



Dr. Bruce Beehler safely stands in front of exhibit glass with a 400-pound lion on the other side.

Standing within inches of a lion, the only thing between you and hundreds of pounds of muscle, claws and fangs is a pane of glass. *Is that glass lion-proof?* you wonder. It is, indeed, says Dr. Bruce Beehler, a Deputy Director of the Milwaukee County Zoo. “We put the windows through rigorous lab testing. We calculated it would have to withstand the worst-case-scenario force of a 500-pound lion running headfirst into the glass at 30 miles per hour; and we used a steel beam to simulate the force of a full-on Themba charge.” Themba is the Zoo’s adult male lion.

The thickness of glass is an obvious aspect of designing exhibits for Zoo animals and for safety. For Happy, a 5,500-pound hippo, it took five layers of sturdy glass laminated with plastic to create a viewing window, the strongest piece of glass in the Zoo. But a lot of what makes for good exhibit design is outside the public’s view (like lab tests for glass strength). In general, an exhibit’s design should seem so natural that visitors don’t even think about it, says Dr. Beehler. “We want them to pay attention to the animals.”

Yet we thought Zoological Society members might want to go behind the scenes and learn some of the “secrets” to creating a great zoo. So here’s a design tour just for you:

Go natural: The Milwaukee County Zoo was a pioneer in 1961 when it opened on Blue Mound Rd. That’s because it displayed many of the animals outdoors in natural-looking environments instead of in metal-bar cages that were used at the Washington Park Zoo (our Zoo’s predecessor). It was another 15 to 20 years before this idea became the norm for most modern zoos. The goal is to make visitors feel they are in the same natural habitat as the animal. Some people call the idea “immersion.” “The predator-prey exhibits are great examples,” says Dr. Beehler. He’s referring to the Zoo exhibits where predators seem to be in the same area as their prey (but are actually separated by moats that zoogoers often can’t see). The seven main predator-prey exhibits are: lions overlooking antelope and zebra, tigers and camels, cheetahs and impala, jaguars and tapirs, polar bears and seals, Alaskan brown bears and moose, grizzly bears and elk.

Immerse yourself: You can actually be inside an exhibit at the Herb & Nada Mahler Family Aviary. Enter through the aviary’s east door, go past the penguins and you enter the free-flight exhibit. Here you’re surrounded by birds that swoosh through the air, walk on the ground and perch on rocks walls and in trees. And what’s that smell? That’s the natural odor of birds that feed heavily on fish, says Alex Waier, the Zoo’s bird curator. Now here are some secrets of this exhibit’s design:

- Two large pumps circulate water throughout the entire exhibit, even up high to allow for a waterfall. “The waterfall adds to the feng shui of the exhibit,” says Waier. “When it’s not working, you realize something’s missing.”
- All water in the exhibit is drained daily.
- Sticks and grasses are regularly placed throughout the exhibit so birds can naturally forage for nest-building materials.
- Natural sunlight streaming into the exhibit is from skylights.

Power to the penguins: Now head back to the aviary's rockhopper and gentoo penguin exhibit. It might look like a mere penguin aquarium, but it's actually one of the most complex exhibits to operate. Did you know it requires:

- Two powerful chillers (and backups for safety). One keeps the air cold. The other keeps the water cold.
- Lighting that mimics the length of daylight during Antarctic seasonal changes. In spring the days are getting shorter in the exhibit. "This keeps penguins in their molting and breeding cycle," says Waier.
- Two types of water filters: a sand filter and diatomaceous earth filter (commonly found in swimming pools).

Giraffe closeup: One important aspect of exhibit design is economical use of space. A good example of this is the MillerCoors Giraffe Experience. In 2006 the exhibit was nearly doubled in size by using viewer-friendly horizontal cables to separate giraffes from the public. If moats had been used to surround the new space, there would have been little room left for giraffes! The new design also included a 6-foot-high viewing deck to put visitors at eye level with the animals. The indoor quarters that housed the giraffes were expanded to create a public

indoor space. You are now in the same airspace as the giraffes, and instead of glass and metal mesh, the only visual separation between the public and the giraffes are the cables. This provides a much more intimate view. Other design features:

- The indoor exhibit floor is cushioned to give giraffes a comfy place to lie down.

- A moveable wall inside one off-exhibit stall allows animal-care staff to get close to giraffes safely, to provide routine medical care and training.
- Skylights fill the indoor exhibit with natural sunlight.

Watch for flying snakes: While giraffes are the Zoo's tallest animals, small animals like reptiles also require specially designed exhibits that cater to their needs. Consider the ornate flying snake exhibit in the Aquatic & Reptile Center (ARC). "It's an arboreal snake. So we use raised branches to keep them above the ground," says Jessica Munson, ARC area supervisor. "Compare this to the rhinoceros viper exhibit to the right, which is designed for a terrestrial snake. It doesn't need elevated branches. So its exhibit has few climbing places." The ornate flying snake exhibit contains more than meets the eye, such as:

- An ultraviolet light plus a heating light to mimic the sun's full spectrum while keeping the coldblooded reptile warm.
- Eighty-degree drinking water, which the snake prefers.
- Misters installed in the ceiling to maintain appropriate moisture and humidity levels. "All of the reptile exhibits have misters," says Munson.



It took five layers of sturdy glass laminated with plastic to create the viewing window (left) into the hippo quarters. Space in the outdoor giraffe yard was expanded by using a fence with horizontal cables instead of a full moat. Skylights provide natural light for the giraffe indoor exhibit.



An Amur tiger prowls behind two camels in one of the Zoo's pioneering predator-prey exhibits. A hidden moat separates the animals.



Follow the direction of Jessica Munson's snake hook and you'll see an ornate flying tree snake on a branch near the top of the exhibit.

M.J. the orangutan detached a misting hose, took off the nozzle and sprayed zoogoers with water.



- The large aquariums use a special “glass” made of acrylic laminated between two thin pieces of glass. “Acrylic is a good insulator but scratches easily,” says Craig Berg, reptile and aquarium curator. “Glass is difficult to scratch but is a poor insulator and fogs up easily during summer. We are one of the few zoos to use this special type of glass.”

Great-ape geniuses: Some people might call orangutans the geniuses of figuring out how to dismantle an exhibit. These endangered great apes possess three key traits: incredible strength, high intelligence and never-ending patience. It's understood that if a great-ape exhibit is “orang-proof,” it can contain any species of great ape.

Take M.J., the Zoo's female orangutan. “She's very mischievous,” says Trish Khan, Zoo area supervisor for primates. “We can't give M.J. any large branches because she'll immediately strip them of leaves and use them as tools and hook items to bring them closer to her.” M.J. has been known to devise tools from blankets, sticks and leaves. Other great apes can make and use tools, too. But “a chimp will lose patience while an orang will think and think about a problem,” says Khan. Perhaps the most famous example of M.J. outwitting the zookeepers was when she detached a hose from its misting nozzle and began spraying zoogoers with water. “I had put the hose through PVC pipe and covered part of the hose nozzle with it,” says Khan. “But M.J. managed to detach it and started spraying people, even using her fingers to create a more powerful spray of water.” Onlookers thought it was great fun.

Tight is not enough: Here are some secrets to housing the orangutans:

- Each screw inside the exhibit has a special locking nut that makes it harder to loosen. “They can still loosen them,” says Khan, “and when they do, they hang onto them and use them to trade for treats.”
- Orangutans like to swing from fire hoses and in hammocks, but everything has to be industrial-strength. And chains and padlocks are needed to connect hammocks to the fire hoses. If the fire hoses were tied together, the orangutans would untie the knots.
- The floor is heated to keep these hot-climate primates comfortable in winter.

Animals all around you: Immersion doesn't occur only when you view an animal in a natural exhibit. According to Dr. Beehler, a walk through the zoological gardens is an exercise in immersion writ large. “You have flamingos just feet away,” he says. “Peacocks and peahens share the curved walkways. Waterfowl live on placid Lake Evinrude and the ponds. It's a beautiful setting.” Plus, the Zoo's woods include wild hawks, owls, fox, chipmunks, bats, songbirds and more. A zoo, he adds, is more than just a collection of animals and exhibits. “It's people coming to see the animals. It is our job to make visitors feel welcome, safe, comfortable and to give them a sense of wonder, learning and empathy with animals.” The ultimate goal of a zoo, says Dr. Beehler, is to inspire people to want to save the animals in the wild. Thus, zoo exhibits and their myriad designs are a means to that noble end.

By Zak Mazur



Lody in his younger days, in the 1980s

Photo by Richard Brodzeller

Lody is the only bonobo ever to have his blood pressure taken while awake. A finger cuff was used. Photo by Mike Nepper



that its food had too much salt. “Through our efforts, a major producer of primate food biscuits significantly lowered the salt level. So thanks to Lody, all the colonies of primates that get this food are benefiting.”

Kidogo’s case inspired Dr. Clyde, who is veterinary

A Big Heart

Lody the bonobo was a pioneer. He was an original member of the Milwaukee County Zoo’s bonobo group, which now has 17 members. He was a patriarch and leader for a quarter-century. He was so loving that he used to carry his bonobo friend Kidogo up exhibit stairs when Kidogo’s diseased heart left him too weak to walk. Lody set several “firsts” in animal healthcare. In the zoo world, where heart disease is epidemic among great apes, Lody was known as the bonobo who had lived the longest – six years – after being diagnosed with heart disease, specifically an enlarged heart. Lody died Jan. 20, 2012. Yet a week later he was still making news at an international meeting of bonobo specialists. They viewed a video, taken not long before Lody died, of him having his blood pressure measured with a finger cuff – the only bonobo to have this done while awake.

Lody is truly a rare example of success in treating ape heart disease. Most apes hide their illnesses and are not diagnosed with heart problems until they die. It was the Zoo’s primary bonobo keeper, Barbara Bell – who had trained Lody to participate in his own health care – who first noticed that Lody tired quickly and was not himself. She alerted veterinarians. He was diagnosed in 2005 and put on a low-calorie, low-salt diet and on blood-pressure medications. (Blood pressure is connected to heart disease.) Soon Lody had more energy, says Bell. Adds Zoo veterinarian Vickie Clyde: “His appetite was better, his muscle mass came back, and he could function as the alpha male in the troop again, providing discipline and directing some of the bonobo social life. He was once again in the thick of things. After we saw how well he improved, we put all of the bonobos on a low-salt diet,” says Dr. Clyde, who also notified the bonobos’ food supplier

advisor to the North American Bonobo Species Survival Plan (headquartered at the Zoological Society of Milwaukee), to review causes of death in all captive bonobos in Europe and the U.S. She discovered the high level of heart disease – the cause of about 45% of adult bonobo deaths. Lody’s case gave her impetus in 2010 to help form the Great Ape Heart Project, with headquarters in Zoo Atlanta. The project’s goals, she says, are to figure out the cause (and prevention) of heart disease in apes; to detect it early enough to treat it; and to help animals like Lody live longer, healthier lives. The project involves 33 institutions and 52 participants, including veterinarians, cardiologists, geneticists, epidemiologists, nutritionists, animal managers, ape specialists, and research pathologists. In the last year the project’s successes include:

- A Milwaukee County Zoo-led study* of 126 echocardiograms from 34 bonobos and six zoos to compare scans from healthy apes with those from apes with heart disease. This will make it easier to diagnose heart disease. The study also looks at gender and age factors. “We see more males with heart disease, and it seems to affect the males at a younger age,” notes Dr. Clyde. The study recommends that all bonobos have an echocardiogram by age 15.
- Submission of a large grant proposal to sustain the project and development of a computer database to track medical information on great apes with heart disease.
- Engagement with a Mexican zoo and European zoos that exhibit bonobos. In January Dr. Clyde gave a presentation in San Diego on treating ape heart disease to the North American Bonobo Species Survival Plan and its European counterpart, with representatives from six European zoos in Belgium, Germany, the Netherlands, and the United Kingdom. (They viewed the Lody video.) Last August, the Great Ape Heart Project helped form a medical team that did unprecedented health assessments of the entire ape collection at two Mexican zoos. It’s hoped that heart data from apes in Europe and Mexico will go into the project’s database.

So thank you, Lody. And farewell.

By Paula Brookmire

*A manuscript has been prepared for publication by Kelly Schultz, a master’s degree student at the University of Wisconsin-Madison, and co-authors Leann Beehler (ultrasound specialist), Barbara Bell, Dr. Clyde and Dr. Samuel Wann (Milwaukee cardiologist).

Something's Fishy

Michelle Uhlig is a zookeeper. She's also a scientist, a plumber and a scuba diver. That's because she works in the Milwaukee County Zoo's Aquatic & Reptile Center (ARC). This building houses most of the Zoo's fish aquariums plus animals such as turtles, snakes and spiders. Zookeepers in the ARC care not only for the animals, but also for their environment – a job that involves keeping the aquariums running, testing water quality and troubleshooting plumbing problems.

As an aquarist – a zookeeper who specializes in fish and aquariums – Uhlig has lots of experience caring for fish and their habitats. She came to Milwaukee in March 2010 after working at the Suncoast Seabird Sanctuary in Florida, the Florida Aquarium, and Underwater World at the Mall of America in Minnesota. Uhlig is the Zoo's first specialized aquarist since 1989, when aquarist Craig Berg was hired; he's now reptile and aquarium curator. Uhlig once considered becoming a veterinarian, she says, and majored in zoology at the University of Wisconsin-Madison. Fish and aquariums attracted her because she likes scuba diving and enjoys working with a wide variety of marine life. At the Zoo, she certainly gets variety. "The ARC has more species of animals than the rest of the Zoo combined," notes Berg. "Additionally, the ARC has five animal phyla and four classes of vertebrates (amphibians, bony fishes, cartilaginous fishes and reptiles), all with vastly different needs. So the knowledge base that is required of the keepers in the ARC is extensive." In fact,

the majority of the Zoo's 2,583 animals are housed in the ARC or cared for by ARC staff. Uhlig helps care for about 1,011 fish, 120 reptiles and 29 amphibians.



Michelle Uhlig near a male California sheephead (at eye level) in the Pacific aquarium.

She specializes in saltwater fish, which includes as much aquarium upkeep as animal care. "With fish, you have to take care of their water," she says. A typical day could include checking on and feeding the animals, but also cleaning filters that collect debris and dirt in the water, keeping an eye on the oxygen levels in the aquariums, and testing water quality. "There's a lot of chemistry that we have to do," says Uhlig.



California sheephead

Guess the Gallons Answers:
1-c (Total gallons: 173,470, including sumps and filtration systems), 2-c, 3-b (Lake Wisconsin has 57,000 gallons.) The other aquarium exhibits (gallons): African Lakes: 8,000 g; Amazon River: 55,000 g; Australia Bird Reef Exhibit: 450 g; holding tanks: 20,000 g; Octopus: 600 g; off-exhibit holding tanks: 3,600 g; Pacific: 28,000 g; Puget Sound: 520 g).

For example, Uhlig monitors water in all aquariums weekly by checking the pH, the level of acidity or alkalinity. Too much or too little acidity can harm the fish, and rapid changes in acidity can be fatal. Fish native to the freshwater Amazon River, such as piranhas, tend to prefer acidic water, which is lower on the pH scale. Saltwater marine animals, like the octopus, prefer an alkaline water, which is higher on the pH scale.



Behind the scenes, Uhlig feeds herring to the leopard sharks, which live in the ARC's Pacific Coast exhibit.

In addition, Uhlig uses a spectrophotometer to measure the water for chemicals such as ammonia, nitrates, and nitrites. If the water is too high in any of these chemicals, they could burn the gills of the fish, she says.

Another task is making sure that water in the Pacific aquarium has the right amount of salt, mimicking ocean saltwater and its nutrients and minerals. Improper amounts of salt could cause stress or illness in fish. This task requires careful measuring and manually mixing special aquarium salt into the tanks. Uhlig and fellow ARC keepers are also the first to encounter and fix plumbing problems – which can take a bit of creativity. For example, a chiller that keeps the octopus tank cool once malfunctioned. So Uhlig placed blocks of ice in the tank to keep it at the proper temperature until a plumber arrived to help. She deftly handled another crisis last November, says Berg, when he and her other supervisor, Jessica Munson, were out of the country doing research. “A pump died in the Reef Exhibit at the Australia Building. Because of Michelle's expertise with filtration systems, she was able to assist the plumber and curators at the Zoo to locate and install a new pump to get the system up and running, with minimal disruption to the exhibit.”

Though challenging, the job isn't without its fun. Uhlig enjoys feeding the fish – especially the sailfin sculpin, which swim to the top of the aquariums waiting for food to be dropped, and the leopard sharks, which are fed with tongs (see photo top left). Another tricky but fun task is scuba diving in the 28,000-gallon Pacific aquarium to clean it. (ARC keepers are certified scuba divers). From putting on full scuba gear to using power scrubbers and then hand brushes on the walls, this takes several hours and is done in pairs. Two keepers dive while two keep watch to make sure all goes well. For Uhlig, it's all a chance to immerse herself in



On the Job



Uhlig tests the water in marine exhibits weekly with a spectrophotometer to make sure it doesn't contain toxic elements from fish waste.

an underwater environment and swim with favorite fish such as the colorful California sheephead. “I like the sheephead,” she says, “because he seems to exhibit a lot of personality by trying to steal food from other animals and trying to nip at divers' feet while we're cleaning the exhibit.”

The sheephead also has another, rather amazing characteristic. Once in its life it can change its sex – switch gears, so to speak. So it makes sense that Uhlig – who switches from chemist to animal feeder to plumber – would relate to this versatile fish.

By Julia Kolker

Aquarium Quiz

- How many gallons of water are in all the aquariums combined at the Milwaukee County Zoo?
 - 1,000,000
 - 50,000 - 75,000
 - 150,000 - 175,000
- How many gallons of water are in the Moon Jellies Exhibit?
 - 500
 - 400
 - 300
- Which aquarium exhibit holds the most water?
 - Pacific Exhibit
 - Lake Wisconsin Exhibit
 - Amazon River Exhibit



Did you know?
One gallon of water weighs 8.35 pounds.

Finding Their Way to Protect Apes



Steve Seyfert, BCBI program steward



Dr. Gay Reinartz and Salonga National Park guards point to bonobos in trees last November. Bonobos are hard to see, much less photograph. At left is Bosona Etienne, with Djuma Ndombe in the background.

In the state parks and national forests of Wisconsin, getting from one place to another is relatively easy. Trails are usually well-defined and marked with colored signs or posts. You often don't need navigation aids, but maybe you carry a map and/or compass. Your cell phone might even have the latest global positioning system (GPS) technology to help you get from point A to point B.

Using your imagination, transport yourself to Africa's Salonga National Park – a park four times the size of Yellowstone and more remote, in the heart of the Congo River Basin. Here the Zoological Society of Milwaukee (ZSM) has established a research station/park patrol post called Etate. Here the ZSM runs its Bonobo and Congo Biodiversity Initiative (BCBI), a program to survey and protect endangered bonobos. Here, there are no signed trails, few compasses and maps, and forget a cell phone signal. So how can you tell where you are and where to go? You often can't. Even people familiar with the Salonga have difficulty finding their way through this ancient and immense forest.

Soon after we started working at Etate in 2002, we realized that park guards often limited their patrols to the same areas.

They did not venture into unfamiliar parts of the park. This presented a real problem for our bonobo-conservation efforts because we knew poachers were going off the main trails and heading deep into the park in search of elephants, bonobos and other animals. We had to do something. So we began a training program for park guards, who also assist ZSM researchers to survey the bonobo population. We aided park anti-poaching efforts by giving guards tools, training and even literacy classes. The work continues today. In 2011, we held four navigation training sessions at Etate for Salonga park guards.

Our training sessions start with the basics: we show guards how to hold a compass and teach them about the cardinal directions (north, south, east and west) and corresponding degrees. Classroom instruction leads to practice in camp. Guards learn to orient themselves, identify both the direction and degrees a particular object is from where they are standing, and follow a compass line from a starting point to final destination.

Once familiar with the compass, guards move on to handheld GPS units. We teach them how a GPS unit works, about latitude and longitude, and basics such as how to remove and replace



A guard trains with a compass and a map.



Guards learn how to read a rain gauge from Patrick Guislain (left).

batteries, how to handle it properly and how to store the unit. They practice at Etate before heading into the forest. Guards learn how to mark and name their location, or “waypoint.” They also learn to use the GPS in combination with their compass to check and verify their route to a destination.

Patrick Guislain, ZSM’s field-site coordinator and a navigation instructor, says he notices mixed reactions in guards when they start using GPS. “Some guards are in awe that such a tool exists,” he says. “It is almost magical to them that this little machine can show where they are on the Earth.” Others express pride that they not only can use GPS to navigate the Salonga, but also that they can demonstrate this accomplishment to colleagues and supervisors. Still others, he surmises, may view GPS as a burden, for now they can no longer remain close to base camp or the patrol post. When we move the training into the forest, guards practice marking and numbering waypoints, verifying distances and headings, and cutting research transects (straight paths perpendicular to a main trail).

The final elements of training are maps and data recording. We teach guards how to read and use maps when in the forest and at the patrol post; guards learn to identify points and features on a map (i.e., villages, rivers and other landmarks), understand research/patrol grids, use the map scale, and plot a patrol route. They need to record all this data so that we can map where the guards are patrolling and what they are observing. Guards fill out a patrol *fiche*, or paper datasheet, with the date, waypoint numbers, habitat characteristics and any observations pertaining to wildlife and human activity. All the data on the *fiche* is analyzed for verification and then entered into a database and downloaded to a computerized mapping system (GIS). Maps are created showing patrol routes and signs of bonobos, elephants and poaching. These maps are very helpful in identifying poaching “hotspots” where more patrols are needed.

The guards spend many hours practicing and honing their abilities in the forest. During training sessions, our instructors set up mock patrols and evaluate the skill level of each guard. We do follow-up training based on these evaluations. But guards also practice on their own during bonobo surveys with the ZSM research team and when on actual patrol. All this training and practice leads to more effective guard patrols, wider law-enforcement coverage and, ultimately, greater protection of the Salonga’s bonobos, elephants and other wildlife.

By Steve Seyfert, BCBI program steward

Bonobo-Conservation Progress in 2011

Poaching of wildlife is a serious conservation issue in the Democratic Republic of Congo (DRC), where the Zoological Society has a research station. To stem an upsurge in elephant poaching, we directed most of our energy and resources last year toward beefing up anti-poaching in the DRC’s Salonga National Park. The ZSM’s BCBI (see accompanying story) team, led by Dr. Gay Reinartz and Patrick Guislain, completed two field missions to the Salonga in 2011. Dr. Reinartz is the ZSM’s conservation coordinator and head of BCBI.

Fueled by a heightened demand for ivory and meat, elephant hunters camped out for months along the Yenge River, a prime access route into the Salonga and near our station, Etate. So for about 18 months, we were forced to suspend travel on the Yenge and much of our research activity in the area. Beginning early in 2011, we partnered with World Wildlife Fund to support four special anti-poaching operations along the Yenge and Salonga Rivers. This meant outfitting large patrols with equipment and rations for 10-15 people and often ensuring logistical support (dugout canoe, outboard motor and fuel). In October, the guards were joined by a company of Congolese soldiers for “Operation Bonobo” (a two-month-long, systematic search for poachers and illegal military weaponry). In the Etate sector, the combined patrols made more than 15 arrests, confiscated as many automatic weapons, and seized illegal bushmeat.

The anti-poaching operations effectively restored ICCN (Congolese park authority) control to the region. Thus, the ZSM resumed our bonobo surveys in the Salonga-Yenge corridor. By the end of the year, we had nearly doubled our survey area from 2010. The great news is that as we survey new areas, we are finding ample signs of bonobos and no major breaks in the bonobo population between the rivers. We are working with ICCN guards to reinforce these new areas.

The insecurity that plagued the Yenge did not hinder our other activities. We continued to train park guards (see accompanying article), restock Etate with equipment and supplies, and do community outreach. This included support for three primary schools, adult literacy classes, and an area farming cooperative. Thanks to good management by Bokitsi Bunda, chief guard at Etate, the guards kept the research station / patrol post safe, despite the buildup of poachers. In 2011, Bunda received the prestigious Abraham Conservation Award from the Alexander Abraham Foundation, which honors men and women in Africa and Asia for their courageous service and commitment to conservation. The Zoological Society congratulates Bunda for this recognition.



Golden-breasted starling

Arrived: July 7, 2011

Herb & Nada Mahler Family Aviary

These starlings sport startling colors. From their trademark golden breasts to their deep green, blue and purple plumage, they're painted with an exquisite palette. And although many female birds blend into their backgrounds for protection from predators, the golden-breasted starling female flaunts her feathers as freely as her male counterpart. She can get away with bold color because she builds a nest in a closed cavity, a hole often made and abandoned by other closed-cavity birds like woodpeckers. So the female doesn't need camouflage. It can be hard to tell the male from the female. At the Milwaukee County Zoo, Milo, the male, has a plastic yellow band on his right leg while Robyn, the new female who arrived last summer, has a plastic yellow band on her left leg (and a metal band on her right). You'll likely spot the two birds side by side. "If you see one fly, shortly thereafter you'll see the other," says Carol Kagy, area supervisor of the Herb and Nada Mahler Family Aviary. The exception is during the first minutes of mealtime. When keepers refill the birds' food (a soft-bill fruit mix of apple paradise pellets, chopped fruits and vegetables, bugs, and dog chow), Milo glides right down from the trees for a sample. Robyn is more timid, waiting until keepers leave to grab a bite. Kagy hopes for some starling hatchlings. "Anytime we get pairs matched, we're eager to breed," she says. You'll find one pair of these golden-breasted starlings (Sadie and her mate) in the large, free-flight exhibit where birds fly freely over your head. Milo and Robyn are just past that exhibit, in a smaller enclosure called Tropic 8, where they share branches with other colorful birds such as violet turacos and red-billed hornbills.



—E.B.

Polar Bear

Arrived: Sept. 21, 2011

Polar Bear Exhibit

Wilhelm the polar bear, at age 27, is an elderly bear. "He's a slow-moving, easy-going guy. Even at his age, though, he is often playful, especially in fresh-fallen snow," says Dawn Fleuchaus, supervisor of the Milwaukee County Zoo's North America area. Willie's love of snow is natural. Polar bears live in the Arctic regions of the U.S. (Alaska), Canada, Norway, Greenland and Russia. They are superbly adapted to temperatures as cold as 50 degrees below zero. Polar bears have a 4-inch layer of fat covered by two layers of fur to keep them warm, an insulating undercoat topped by guard hairs of various lengths. Each hair shaft is transparent and pigment-free with a hollow core that scatters and reflects visible light. Their skin is black. Compact ears and a small tail also prevent heat loss. Polar bear paws are perfect for roaming the Arctic. At up to 12 inches across, paws help distribute the bear's weight as it walks on thin sea ice. Its feet can grip the ice thanks to 2-inch claws and black footpads covered by small, soft bumps called papillae, which keep the bear from slipping. When the bear swims, front paws act like large paddles and rear paws serve as rudders. In the wild, polar bears eat primarily seals, specifically seal fat, the highest calorie food source possible. Willie has food allergies. So he does not get beef and other foods that Snow Lilly, the female polar, eats. They both are fed lard to maintain their fat layer, but Willie is on a strict diet of ground chicken, fish, chicken-and-rice senior dog food, and fresh produce. Polar bears are mainly carnivores (meat eaters), but Willie enjoys a salad with his entrée, says Fleuchaus. "Romaine lettuce is one of his favorite foods." Willie, who is here on a two-year "sabbatical" while his exhibit at the North Carolina Zoo is renovated, alternates on exhibit with Snow Lilly.



—M.K.

Eastern Bongos

Arrived: Nov. 23, 2011

Bongo Exhibit



Eastern bongos are a secretive bunch. They were such good hiders that few people besides native Africans had seen them until the 1960s! Unfortunately, they didn't hide well enough to stop poachers from tracking them with dogs through dense forests and reducing their numbers to near extinction. "Bongos are one of the most colorful and recognizable antelope," says Tim Wild, large mammals curator at the Milwaukee County Zoo. This spring, when it gets above 50 degrees, zoogoers will be able to spot two new female eastern bongos at the Zoo: Zuri and Sydney. They came from the Jacksonville Zoo and Gardens in Florida to join resident female Meru. Eastern bongos have striking, chestnut-colored coats with white stripes and large horns that tilt back enough so they can travel through their home forests, mainly in the Aberdere Mountains of central Kenya. The deep forests that shelter and conceal eastern bongos from predators also supply most of their vegetarian diet of leaves, vines and roots. Besides hunting, habitat destruction has caused the eastern bongo's population to shrink to fewer than 150 in the wild. However, there is hope for these critically endangered hiders; conservation efforts have been in place for several years. Programs like the Bongo Repatriation Project in Kenya, where our Zoo sent a bongo in 2004, release captive-born bongos on Mount Kenya to help replenish the species in the wild. As of 2009 there were more than 60 bongos in the sanctuary, up from the original 18, according to the Mount Kenya Wildlife Conservancy. Meanwhile, the population of bongos in captivity has increased, says Linda Bachers, our Zoo's registrar, to about 630, up from about 75 a decade ago.

—L.M.



Black-footed cat

Arrived: Oct. 26, 2011
Small Mammals Building

Looking out from the center of a hollow log, Josie the black-footed cat looks a lot like a domestic house cat. Yet this new resident in the Small Mammals Building, at the west end of the Milwaukee County Zoo, is truly a wild cat. Black-footed cats are the smallest wild cats in Africa, standing about 10 inches tall at the shoulder and weighing 3 to 4 pounds. They are nicknamed “anthill tigers” because of their courage and fierceness, and because they often inhabit abandoned termite mounds. Like her wild cousins, Josie, age 3, is “secretive, but not shy or afraid,” says Rhonda Crenshaw, area supervisor in Small Mammals. “She is very feisty. She acts like she’s a bigger cat. And she likes the enrichment items we provide, especially dragging around balls and towels that are bigger than she is.” Black-footed cats are named for the black

soles of their feet. The hair on the bottom of their feet helps protect them from the hot, burning sand in the arid brush lands and semi-deserts of their native habitats in South Africa, Botswana and Namibia. They are solitary (except for mothers with kittens) and strictly nocturnal. They hunt only after sunset and return to abandoned burrows or termite mounds during the day. Their diet in the wild includes rodents and birds. These tiny predators use their small body size, camouflage coloring, and the cover of darkness to conceal themselves from prey and predators. They are rarely seen by humans in the wild. You can see Josie on the nocturnal side of the building, which is kept dark so that animals normally active at night will be somewhat active when zoogoers visit during the day.

—M.K.



Bongo



Candid Cameras

Last year the Zoo's three orangutans were introduced to iPads. In keeping with the high-tech theme, now it's time for candid cameras!

Contribute to the Zoological Society of Milwaukee's 2012 Annual Appeal so we can help install Web cams* in *four* animal areas at the Milwaukee County Zoo:

1 Orangutans:

Watch Tommy, young Mahal and Mom M.J. from your own computer

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Zoological Society of Milwaukee County
10005 W. Blue Mound Rd., Milwaukee, WI 53226
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