ADVANCE YOUR CAREER & CONTINUE YOUR PROFESSIONAL EDUCATION ONLINE!

Our programs in Zoo & Aquarium Science and Wildlife Rehabilitation give you the training you need to grow and advance in your field.

Small class sizes and professional faculty guarantee you a personal education with the individual attention you deserve.

START TODAY AND EARN YOUR CERTIFICATE IN AS LITTLE AS SIX MONTHS!

Visit us at www.AnimalEdu.com
Toll free (866) 755-0448

learning partner

ASSOCIATION OF ZOOS & AQUARIUMS

Animal Behavior Institute

a more personal education
ENRICHMENT OPTIONS
19
Ratite Enrichment Options

TRAINING TALES
20-21
Abdominal Ultrasound Training with 0.3 Angolan Colobus Monkeys

MY AAZK
22-25
Engaging Citizen Scientists to Determine Disease Prevalence at Long Branch Nature Center in Arlington, Virginia

FEATURED ARTICLES
12-15
Naturalistic Enrichment – it can work!
Sheila Wojciechowski

16-17
Public Perception of Zoos
Joshua Sisk

CHAPTER NEWS
18
Akron Zoo Chapter of AAZK
Discover what tens of thousands of customers—including commercial reptile breeding facilities, veterinarians, and some of our country's most respected zoos and aquariums—have already learned: with Rodentpro.com®, you get quality AND value! Guaranteed.

RodentPro.com® offers only the highest quality frozen mice, rats, rabbits, guinea pigs, chicks and quail at prices that are MORE than competitive. We set the industry standards by offering unsurpassed quality, breeder direct pricing and year-round availability.

With RodentPro.com®, you’ll know you’re getting exactly what you order: clean nutritious feeders with exact sizing and superior quality. And with our exclusive shipping methods, your order arrives frozen, not thawed.

We guarantee it.

Order online!

www.RodentPro.com

It’s quick, convenient and guaranteed!

P.O. Box 118
Inglefield, IN 47618-9998
Tel: 812.867.7598
Fax: 812.867.6058
E-mail: info@rodentpro.com

PayPal

©2007 Rodentpro.com, llc.
MISSION STATEMENT
American Association of Zoo Keepers, Inc.

The American Association of Zoo Keepers, Inc. exists to advance excellence in the animal keeping profession, foster effective communication beneficial to animal care, support deserving conservation projects, and promote the preservation of our natural resources and animal life.

About the Cover

This month's cover features Rudi, a Black and White Colobus Monkey (Colobus guereza), submitted by Ashley Arimborgo of Cheyenne Mountain Zoo. Colobus are native to central Africa and are found primarily in forests. Their name is derived from the Greek word for "mutiated", interestingly because they are the only species of monkey with no thumbs. Their long hair creates a "cape" on their back that helps them while leaping through the treetops by creating wind resistance, much like base-jumpers do with their outfits. Rudi is very protective of the females in his troop at the zoo and is always watching over them and keeping the peace between the sisterly rivalry.

His keeper is currently working on crate training with him and he will put himself into the crate and close the door after he enters it! He is also a superstar during the Colobus Training demo that happens daily during the summer, and as one of the most eager members of the troop has been able to help shape the show to showcase many behaviors that his keepers captured through that enthusiasm.

Articles sent to Animal Keepers' Forum will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for AKF. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the Editor. The Editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone, fax or e-mail contributions of late-breaking news or last-minute insertions are accepted as space allows. Phone (330) 483-1104; FAX (330) 483-1444; e-mail is Shane.Good@aazk.org. If you have questions about submission guidelines, please contact the Editor. Submission guidelines are also found at: aazk.org/akf/submission-guidelines/

Deadline for each regular issue is the 3rd of the preceding month. Dedicated issues may have separate deadline dates and will be noted by the Editor.

Articles printed do not necessarily reflect the opinions of the AKF staff or the American Association of Zoo Keepers, Inc. Publication does not indicate endorsement by the Association.

Items in this publication may be reprinted providing credit to this publication is given and a copy of the reprinted material is forwarded to the Editor. If an article is shown to be separately copyrighted by the author(s), then permission must be sought from the author(s). Reprints of material appearing in this journal may be ordered from the Editor. Regular back issues are available for $6.00 each. Special issues may cost more.

MEMBERSHIP SERVICES
Animal Data Transfer Forms available for download at aazk.org. AAZK Publications/Logo Products/Apparel available at AAZK Administrative Office or at aazk.org.
FROM THE PRESIDENT

Happy New Year!

This can apply to all aspects of our lives, including AAZK. Think about what qualities you or your Chapter can bring to AAZK, whether it is a skillset, time commitment or financial donation. All will help AAZK bring membership benefits to you this coming year.

Year in Review

► Last year, AAZK Chapters donated $446,484 to conservation organizations not including BFR (Bowling for Rhinos). I can’t wait to see the totals for 2015! This year to date, we have totaled just under $600,000 ($596,533.95) for BFR. You should be very proud of yourselves! Supporting conservation organizations is just one way zoo keepers show everyone their passion, purpose and professionalism.
► The Communications Committee helped grow our National AAZK Facebook page to over 6000 followers, helped improve the meeting communication practices for the committees and answered zoo keeping profession questions.
► The Conservation Committee has continued to grow The Trees for You and Me Program and will have new ways to participate. They also brought you the very successful and fun Rhino Rally at the conference.
► The Grants and Awards Committees worked to support you. They are in the process of making the nomination forms friendlier. Please nominate someone this year!
► The Professional Development Committee worked together with the St. Louis Chapter all year to help bring you a very successful program at the National Conference.

BFR Changes

In order to be compliant with IRS regulations, we all need to make some changes on how we report our BFR event accounting. Chapters will be receiving instructions with their recharter packets on the new process. Highlights include:

► All events will need to be sanctioned first.
► A BFR event kit will be supplied containing:
  ○ BFR Financial Spreadsheet
  ○ BFR Donation Tracking Spreadsheet
  ○ BFR Personal Donation Thank You
  ○ BFR Business Donation Thank You
  ○ BFR Formal Acknowledgement
  ○ BFR Blank Receipts
  ○ In-Kind Donation Acknowledgement
► All donations need to be tracked and documented with sponsor sheets, cancelled Check/CC Transaction, Thank You Letters, Issuance of Receipt or an E-mail.
► The IRS considers silent auctions, raffles and door prizes as gambling, so each Chapter or event holder will need to check with their state for specific rules and there will be specific information in the BFR kit on how best to document and report.

The new process is just expanding what we already do for our BFR events. We already track our donors and auction winners so we can contact them again. We already record our expenses and how much is donated. The IRS is just adding a couple more steps. The most important thing to remember is, help in understanding this new process is just an e-mail or phone call away to the National AAZK Office – Simply Contact Ed at the National Office!

2016 will be full of challenges and new adventures for us all. Please contact me if I can be of assistance at Penny.Jolly@aazk.org.

Best Regards,

—Vern McLellan

"What the new year brings to you will depend a great deal on what you bring to the new year."

Penny Jolly

American Association of Zoo Keepers, Inc.
PREMIUM NUTRITION FOR YOUR CARNIVORES

Your animals are your zoo. Protect and care for them with the most nutritious carnivore entree in the industry. The first all-pork complete diet formulated specifically for zoo carnivores, Carnivore Essentials is backed by years of extensive field research and testing, and proven to be a safe, nutritious diet for all carnivores. Your animals deserve only the very best. Feed them Carnivore Essentials.

www.CarnivoreEssentials.com  800-890-7039  sales@CarnivoreEssentials.com
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Location</th>
<th>Hosted By</th>
<th>For More Information Go To:</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 19-24, 2016</td>
<td>AZA Mid-Year Conference</td>
<td>Omaha, NE</td>
<td>Hosted by Omaha's Henry Doorly Zoo and Aquarium</td>
<td><a href="http://aza.org/midyearmeeting/">aza.org/midyearmeeting/</a></td>
</tr>
<tr>
<td>April 11-15, 2016</td>
<td>Practical Zoo Nutrition Management Course</td>
<td>Front Royal, VA</td>
<td>Smithsonian Conservation Biology Institute.</td>
<td><a href="http://gmu.edu/programs/graduate-and-professional/professional-training-courses/nutrition/">gmu.edu/programs/graduate-and-professional/professional-training-courses/nutrition/</a></td>
</tr>
<tr>
<td>May 9-12, 2016</td>
<td>The International Giraffid Conference</td>
<td>Chicago, IL</td>
<td>Hosted by Brookfield Zoo</td>
<td><a href="https://www.czs.org/giraffid">https://www.czs.org/giraffid</a></td>
</tr>
<tr>
<td>May 12-17, 2016</td>
<td>Best Practices in Animal Keeping Course</td>
<td>Buffalo, NY</td>
<td>Hosted by AZA and Buffalo Zoo</td>
<td><a href="https://www.aza.org/BPAK.aspx">https://www.aza.org/BPAK.aspx</a></td>
</tr>
<tr>
<td>June 12-16, 2016</td>
<td>24th International Conference on Bear Research &amp; Management</td>
<td>Anchorage, AK</td>
<td>International Association for Bear Research and Management</td>
<td><a href="http://www.iba2016.com">www.iba2016.com</a></td>
</tr>
</tbody>
</table>
The deadline for nominations is 1 May 2016. Information concerning the qualifications, nomination procedure, selection procedure and an explanation of the awards may be obtained at aazk.org under committees/awards.

If you have questions, please contact Janet McCoy at janet.mccoy@aazk.org.

- **Lifetime Achievement Award (LA)**
  This award is given at the end of a keeper's career and recognizes outstanding commitment to professionalism as a zoo keeper over a long period of time, and significant contributions to the community.

- **The Lutz Ruhe Meritorious Achievement - AAZK Professional of the Year Award**
  The award recognizes professional members of AAZK, in good standing in the Association, for their outstanding day-to-day professionalism within their facility.

- **Jean M. Hromadka AAZK Excellence in Animal Care Award**
  The award recognizes outstanding achievement and determination of an individual or team in the animal care field and in fostering professionalism.

- **Lee Houts Excellence in Enrichment Award (LHEE)**
  The award recognizes outstanding keeper-initiated contributions to advance the art and science of environmental enrichment.

- **Certificate of Merit for Zoo Keeper Education (CMZE)**
  The award recognizes individuals, institutions and organizations in the zoological community most actively promoting educational programs for zoo keepers.

- **Certificate of Excellence in Exhibit Design Renovation (CEER)**
  The award recognizes institutions or organizations in the zoological community for the design and renovation of existing animal facilities which involved active keeper participation in the process.

- **Certificate of Merit in Conservation Award (CMC)**
  The award recognizes outstanding keeper-initiated contributions to conservation of wildlife and their habitats.

- **Mazuri® Animal Nutrition Award (MANA)**
  The award recognizes individuals in the zoological community who have been actively involved in projects/studies/research concerning zoo/aquarium nutrition.
Available Grants

So you don’t have enough funding to cover the conference, research or conservation project you would like to do? Well, look no further! AAZK offers three exciting grants to help you grow in your career as a zoo keeper. Applications and guidelines for each grant can be found on the AAZK website. The deadline for all three grants is March 1 so start planning now so you won’t miss your chance to apply. If you have questions, please contact Jessica Munson at jessica.munson@aazk.org.

THE AAZK PROFESSIONAL DEVELOPMENT GRANT

The AAZK Professional Development Grant is designed to assist AAZK members with costs associated with attending professional meetings or workshops, or, participating in field research. There is a total of $2000 for this grant; amount can be divided among applicants. Deadline is March 1.

Qualifications: Full-time keepers/aquarists in zoological parks and aquariums, who are professional members of AAZK, Inc. in good standing, are eligible to receive grants.

THE AAZK RESEARCH GRANT

The purpose of the AAZK Research Committee’s Zoo Keeper Grant in Research is to encourage and support efforts in non-invasive research conducted by AAZK members in zoological parks and aquariums around the world. There is a total of $2000 for this grant; amount can be divided among applicants. Deadline is March 1.

Qualifications: Full-time keepers/aquarists in zoological parks and aquariums, who are professional members of AAZK, Inc. in good standing, are eligible to receive grants. Researchers other than zoo keepers may participate in the funded studies. The principal investigator, however, must be a keeper/aquarist.

THE AAZK CONSERVATION, PRESERVATION AND RESTORATION GRANT

The purpose of the AAZK CPR Committee’s Zoo Keeper Grant in Conservation is to encourage and support efforts in conservation conducted by AAZK members in zoological parks and aquariums around the world. There is a total of $1000 for this grant, amount can be divided among applicants. Deadline is March 1.

Qualifications: Members of the AAZK, Inc. in good standing are eligible to apply and receive grants. The member must have an active role in the conservation effort submitted for consideration. Because of the nature of conservation projects, the scope of the project or number of people involved will not be restricted.
Advanced Felid Husbandry Course (AFHC)

The Felid TAG is proud to offer its first Advanced Felid Husbandry Course (AFHC). The AFHC focus this year will be Safety and this includes all aspects of safety related to the care of captive felids. Sample topics during the course include: mitigating human error, communication, handling emergencies, transports, and training of animals and staff, among others. The format will include guest speakers, lectures, group exercises and discussion panels.

The AFHC is meant to supplement and compliment the three-day Felid Husbandry Course that has previously been offered. Therefore, the target audience for this course is individuals that have previously taken the full three-day course and have a minimum of five years experience working with animals in a zoological setting. The course will run May 15-17, 2016 just prior to the Felid TAG mid-year meeting at the Denver Zoo. Application for attendance and scholarship information can be found at felid-tag.org. **Deadline for the applications is January 31, 2016. Class size will be limited.**

Questions about the course can be directed to fazij@si.edu. Applications can be submitted to AshleighL@sfzoo.org.
Naturalistic Enrichment – it can work!
Sheila Wojciechowski, Senior Keeper
Chicago Zoological Society / Brookfield Zoo
Brookfield, IL

Introduction
Zoological institutions have been moving towards naturalistic exhibits for quite some time now. There seems to be agreement that it is best for the animals and best for guests to see animals in their natural environment. More recently, some zoos have been moving towards the use of naturalistic enrichment. Unlike the natural exhibits, the concept of natural enrichment is more controversial. While some zoological personnel argue that guests need to see animals in a completely natural environment, others feel that this is too restrictive and cannot meet the needs of the animals. This concern over conflicting needs of animals and visitors has been studied from only one perspective - if unnatural enrichment can fulfill visitor needs (Yoder, 2014; Kutska, 2009; MacPhee et al., 1998). In this project, I research the opposite question to examine if naturalistic enrichment can fulfill the animals' needs.

Orangutan demonstrating finger dexterity by picking at dry Kool-Aid powder at front of the exhibit. The animals will be engaged in this “food source” throughout much of the day.

There is no doubt that increased animal activity improves the guests' experience. In fact, guests will spend approximately twice as long viewing active animals vs. inactive animals (Bitgood et al., 1988). It has also been shown that guests viewing active animals are more likely to engage in conversation with each other about the animals (Altman, 1998). This has led some to argue that we should increase animal activity utilizing any method (i.e. naturalistic or unnatural enrichment). Furthermore, many studies try to show that guests “don’t mind” unnatural enrichment. For example, when viewing animals with naturalistic or unnatural enrichment, guests are equally likely to say that they felt connected to the animal and that enrichment is important to the animal (Yoder, 2013). It has also been shown that in some situations,
having an unnatural enrichment item in a naturalistic enclosure does not affect whether or not the guests view the exhibit as being natural (MacPhee et al., 1998). Another author has concluded that naturalistic vs. unnatural enrichment does not adversely alter visitors’ perceptions of the zoo as a whole or the zoo’s mission (Kutska, 2009). While these conclusions may be reasons to argue that unnatural enrichment is acceptable, I investigate if other solutions may also be acceptable or even provide additional benefits.

Nobody will argue with the fact that (unnatural) enrichment rotations benefit the animals in many ways such as increasing activity levels, increasing natural behaviors, and decreasing undesirable behaviors. Can a naturalistic enrichment rotation do the same thing? One study of orangutans within a zoo environment has shown that even a simple enrichment rotation of natural items such as browse and hay increases activity levels by over 50% (Tripp, 1985). Is this less effective than an unnatural enrichment rotation? Do unnatural enrichment items increase activity levels more than naturalistic items? There is already some evidence that may contradict this thought. For example, while studying guests’ reactions to polar bears with naturalistic vs. unnatural enrichment, it was observed that the polar bears actually interact more with naturalistic enrichment and display less stereotypical behaviors when they have naturalistic enrichment vs. unnatural enrichment (Kutska, 2009). This area needs further research.

With the Chicago Zoological Society’s mission including inspiring conservation leadership and connecting people with nature, an emphasis is placed on providing the animals with natural opportunities to be viewed by the guests. Upon removing unnatural items from our exhibit enrichment rotations, keepers did feel this was restricting our animals’ opportunities at first. Instead of arguing against it, we decided to work with it and see if we could create better welfare for our animals with the guidelines given to us. This paper discusses one example of how we keepers empowered ourselves to create the best enrichment rotation for our animals. The methods we used to develop the new rotation and how we documented the results are discussed. Furthermore, a project like this provides additional benefits of team-building and professional growth opportunities, which are beneficial in continuing to improve the welfare of other animals in our care.

Methods:
Subjects: Brookfield Zoo houses two groups of orangutans, rotated on exhibit in the morning and afternoon. The focus of this study is the adult male in each group. Ben is a 36-year-old Bornean orangutan (*Pongo pygmaeus*), housed with a 33-year-old female and their 5-year-old daughter. Brunei is a 23-year-old Bornean/Sumatran hybrid orangutan, housed with a 52-year-old female Bornean orangutan.

Procedure:
Working as a team was important to us throughout this project. We started off by picking a goal together. Keepers noticed that each of our male orangutans spent a good amount of time completely out of view of the public in a small cave-like structure of the exhibit that conceals the shift doors. This may be due to the males wanting to see each other or the animals wanting to see the keeper working in the holding area. Regardless of the reason, we thought that potential welfare improvements could be made if we encourage them to utilize more of their exhibit space and decrease the amount of time they spent inactive in this confined space. Therefore, we agreed on the goal to increase animal welfare by using male orangutan visibility on exhibit as a proxy for activity levels. We also chose to document this behavior ourselves, using a very simple method that would easily fit into the keepers’ busy day. There are multiple keepers working daily that routinely check on their exhibit animals throughout the day. We developed a very simple, monthly check-sheet. The dates were listed down the side, with the time of day (in half-hour increments) listed across the top. Whenever we walked through our exhibit, we simply note an “X” on the check sheet if the male was visible on exhibit or an “0” if the male was not visible inside the cave. We ended up with many data points every day and an average of 155 data points throughout the month. At the end of every month, we calculated the percent of time animals were visible on exhibit and recorded this in the animals’ permanent records. We did this for six months before we implemented our new enrichment rotation.

By doing this project ourselves, the six months of baseline data collection gave keepers the opportunity to think about our goal, notice what animals were doing, and brainstorm on ways to make changes. We posted a blank sheet of paper next to the check-sheet, so keepers could write down ANY thoughts they had. While it can sometimes be challenging for experienced keepers to develop new ideas, having a specific goal in mind really seems to help keepers focus on something and lead even “old” keepers to come up with “new” ideas. Some of the topics we thought about in our brainstorming included: What are the orangutans doing when they are visible, which led to brainstorming of how we could increase that. Which of our current enrichment items are producing a greater effect than other enrichment items? Where are the
animals spending time on exhibit? This could lead to brainstorming on placement of enrichment items, diet items, or nesting materials. Social interactions between the animals give ideas on quantity or distribution of enrichment items. All keepers added ideas to the brainstorming list, which led all keepers to further expand on the thoughts of each other. The teamwork and sharing thoughts with everyone on the team allowed us to further expand on each other's ideas and continue to generate more.

Next, the keepers sat down together and verbally brainstormed enrichment items and strategies. We noted several current enrichment items that worked better than others. We also noted that placement of items was important. For example, a large frozen juice block can easily be broken and depleted quickly if hung from a tree. Whereas if we hung it from a vine, the animals could not break it as easily and it lasted much longer. There are places on the exhibit where our female doesn't prefer to spend time. Even though she is the dominant animal, by placing enrichment in these areas the male has a greater chance of getting to them before she does. We also noted that how we prepare an item makes a difference in the animals' use of the item. For example, we have a puzzle feeder made with PVC and disguised to look like a branch. It has small holes in it. We originally put dry treats, such as cereals, in it for the animals to turn and shake out. This didn't take them very long. We decided instead to put a liquid treat in it (such as applesauce) and give them small sticks to fish the stuff out. This proved to be more effective in meeting our goal. Another method we used for brainstorming was to think about a behavior we want and brainstorm on ways to achieve that behavior. For example, we know orangutans are good "tool-users." How can we get them to utilize tools on exhibit? This led to the idea of smearing peanut butter up high on the wall utilizing a scraper attached to the end of a pole. The orangutans are given real logs with holes. We originally put dry treats, such as Peanut butter smeared up high with sticks provided to animals.

<table>
<thead>
<tr>
<th>Morning enrichment items</th>
<th>Mid-day enrichment items tossed on to exhibit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Shavings forage pile with any dry treat (e.g. cereals or seeds)</td>
<td>Shavings pile with forage item tossed to the animals in paper bags</td>
</tr>
<tr>
<td>2. Peanut butter smeared up high with sticks provided to animals</td>
<td>Peanut butter smeared on small branches, tossed to the animals</td>
</tr>
<tr>
<td>3. Real foraging logs with holes for animals to pick items out</td>
<td>Toss &quot;bimples&quot; to the animals. (A commercially available dog chew-toy, made from cornstarch.)</td>
</tr>
<tr>
<td>4. Large frozen juice block, hung where animals can't break it</td>
<td>Small frozen juice blocks</td>
</tr>
<tr>
<td>5. Naturalistic-looking PVC puzzle feeder</td>
<td>Toss hard-shelled nuts or coconuts to the animals.</td>
</tr>
<tr>
<td>6. Puzzle feeders hung in door-way (people can't see items, but can see animals using them)</td>
<td>Re-fill puzzle feeders</td>
</tr>
<tr>
<td>7. Dry Kool-Aid or Jell-O® powder sprinkled along the front ledge of the exhibit</td>
<td>Toss frozen fruit to the animals.</td>
</tr>
</tbody>
</table>

Figure 1: New naturalistic enrichment rotation created.

Discussion:
While keepers may sometimes have limited options, often the best thing to do is move forward with whatever is within your realm of control. We were given limited options for what we can utilize on our exhibits as enrichment. We chose to see if we can make this work for the animals. With enrichment becoming such a common practice, keepers have brainstormed more and more items, and many more options are available to purchase. During my time as a zoo keeper, I have witnessed enrichment rotations go from three items rotated around twice per week, to hundreds of items rotated more on a monthly basis. While it may seem detrimental to go back to a seven item enrichment rotation on a weekly schedule, it proved not to be the case in this project. With so many different items, there is no guarantee that each item is effective. In this study, we chose to focus on quality rather than quantity. We believe that effectiveness is more important than variety. There actually are additional items that we could have used in our new naturalistic rotation, but we selected for the items that had the greatest impact on our animals' behavior to see if this can be maintained long-term. The best advice given to me about creating enrichment for our animals is "Let's not try to create a good five minutes for the animals. Let's create a good day for the animals!" Many enrichment studies look at how much an animal utilizes an enrichment item for a short period of time right after it is provided. In this study, we strove for an increase in desirable behaviors (i.e. utilizing entire exhibit space) over the course of the whole day. This is more challenging than increasing visibility on exhibit right after the item is provided and is a better indicator of the positive effects of enhanced exhibit engagement. While variety is important, it is not necessary to provide all your enrichment items equally. The items not

Results:
Keepers continued using the exact same check-sheet, noting whether the males were visible on exhibit or not visible inside the cave whenever we walked through the exhibit. We also continued to record total percentage of time visible each month in our records. It was apparent right away that we were increasing the amount of time our male orangutans are visible on the exhibit. Still, the question was if we provided enough variety to increase exhibit use and activity that might produce long-term, positive welfare implications. After an additional six months, we were very pleased to see the final results of an increase in time spent in view on the exhibit from 39% during the baseline condition to 62% with our new enrichment rotation!
They witnessed an orangutan utilizing a stick to get honey out of a deep crevice. It would be that limiting to the animals. Our orangutans spend part of their day on exhibit and part of their day in the holding area. Our original enrichment rotation had the animals receiving the same enrichment whether they were on exhibit or in holding. For the most part, they are receiving the same enrichment items, just at different frequencies in different locations with unnatural items provided in off-exhibit areas.

Further investigation is needed to understand the benefits to the guests when using naturalistic enrichment rotations. A few studies have shown that guests do not have negative impressions of unnatural enrichment. However, can we provide a better learning experience with naturalistic enrichment? While guests might not notice a Rubbermaid® container when using naturalistic enrichment, they are more likely to notice a Rubbermaid® container if they witnessed an orangutan utilizing a stick to get honey out of a deep crevice of a log. Indeed, even Kutska points out that guests exposed to naturalistic enrichment have more questions related to general polar bear knowledge, and suggests that "perhaps an entirely naturalistic approach may stir an interest in guests to find out more about the species" (pg 303). Zoos provide a source of passive learning that can be effective if presented correctly. Do we want guests to learn that even big animals like polar bears enjoy playing with "toys"? Or do we want guests to witness and learn that despite their large size, orangutans spend a lot of time in trees and can hang from thin vines to get at a food patch (frozen fruit block) that is suspended there? How does this type of educational experience (witnessing natural or unnatural behaviors) affect guests' conservation action? Miller (2012) documented the negative side of this. Guests are less likely to support zoological facilities if they witness negative behavior (such as a tiger pacing). It is unknown if witnessing something like an orangutan retrieving a natural tree branch, breaking off the twigs to create a straight stick, and utilizing it to reach for a food source (i.e., peanut butter), will help guests connect orangutans to rainforests and our graphics about the palm oil crisis, and encourage guests to make better choices about the products they buy.

Acknowledgements:
The keepers of Tropic World Asia are AMAZING in how they welcomed me onto their team, taught me so much about orangutan husbandry, and worked together on a project like this. Ben, Brunei, Sophia, Maggie, Kekash, and I thank Alisha Benavides, J. Megan Ferguson, and Amy Coons for their dedication to the animals in their care. We are all grateful for the encouragement and support of our supervisors, Nava Greenblatt and Craig Demitros, who instilled these values in their team and facilitated a project like this. The skills I learned through Tim Sullivan and the Brookfield Zoo Enrichment Team are invaluable to me.

Photos courtesy of Chicago Zoological Society photographer, Jim Schulz

References:
Introduction:
Zoos accredited by the Association of Zoos and Aquariums (AZA) promote themselves as venues for education and conservation. They are living museums where visitors can learn about the world’s biodiversity (Marino et al., 2010). One of the most universal elements of a zoo’s mission is to foster connections between humans and wildlife in hope of promoting pro-conservation behaviors within visitors. Zoos also contribute to important breeding programs that help sustain endangered animal populations while contributing to conservation fieldwork (Skibins & Powell, 2013).

With over 134 million visitors a year, AZA zoos have the capability to reach a large audience, and inevitably with such a large audience comes a large volume of scrutiny regarding how animals are cared for within AZA institutions (Patrick et al., 2007). Animal welfare is a controversial topic with critics calling into question the legitimacy of keeping animals in captivity at all. Negative accusations from animal activist groups and even the general public can be counterproductive to the work zoos wish to accomplish and waste resources that must be spent in the defense of an institution (Cochrane, 2009). So where does this animosity come from? Most zoo visitors associate wild animals with the emotional attachment they have for a pet, especially dogs. This emotionally driven perspective often leads to a misunderstanding of what constitutes sound animal welfare practices for particular species (Kawata, 2013). For example, visitors may often question why the polar bear is alone in an exhibit or become frustrated with the fact that the lions are always asleep. Looking at this from an anthropomorphic perspective, those same visitors would logically assume that the polar bear is lonely and that the lions are depressed. However, from an objective, biological perspective it is understood that polar bears in the wild live a solitary lifestyle, and introducing a companion could actually be detrimental to the polar bear’s overall health and well-being. Similarly, wild lions spend the majority of the day resting in the shade of acacia trees, storing energy for when it is time to hunt. These are the types of animal welfare discrepancies and challenges that zoos strive to overcome: they must connect humans with wildlife and provide opportunities for visitors to engage with the truth and wonder of it all.

Research
The purpose of this study was to identify how the general public perceives animal welfare within zoos; is there a difference between the views of those classified as zoo visitors versus non-zoo visitors? A survey was distributed to randomly selected individuals in Central Park in New York City, and of those who were approached, a total of 186 participants elected to take the survey. By choosing to survey visitors outside of a zoo environment, the chances that participants would be influenced by the happenings of a particular zoo visit were decreased. The survey questions were constructed using a standard Likert scale with 1 being “no” and 5 being “yes”. The first survey question was used to assign participants to either the zoo visitor or non-zoo visitor group. It was hypothesized that zoo visitors will have a more positive perception than non-zoo visitors. This hypothesis was based on the fact that zoo visitors indirectly support zoos by paying admission.

The survey contained six questions, including whether or not the participant routinely visits zoos. The other five questions referred to how zoos and animals are perceived. There were two questions that focused on the level of anthropomorphism that is attributed to animals in captivity. Whether or not people compare human traits and emotions to those of animals is a significant part of determining the perceptions people have of animals in captivity. Participants were asked if they feel animal intelligence and feelings can be compared to those of humans, and whether or not the animal behaviors witnessed at a zoo were congruent with that animal’s natural behavior when forming opinions about zoo animal welfare.

Analysis of the data showed no significant difference between the reported perception of non-zoo visitors and zoo visitors. Despite this
finding, over 71% of participants either answered “somewhat” or “yes” in reference to thinking about an animal’s natural behavior prior to forming an opinion on zoo animal welfare. Interestingly, 61% of these same participants also indicated that animal intelligence and feelings can be equated to humans; this is quite the contradiction. To compare animal intelligence and feelings to humans indicates a lack of understanding of natural behavior and animal instinct which affirms the importance of connecting humans with wildlife through educating the public about this type of information. As zoos work to gain public support, research into how zoos are perceived will be essential (Smith, 2013).

The two most important goals accredited zoos attempt to reach are excellence in animal husbandry and the ability to educate and instill a passion for wildlife and conservation in its visitors (Grazian, 2012). Two questions survey participants answered dealt with these two important aspects of the zoo mission. Both questions showed a significant difference in how zoo visitors and non-zoo visitors perceive zoos. Compared to non-zoo visitors, zoo visitors recognize that accredited zoos serve an important role in education and conservation. They also felt animals in zoos receive good care. This supported the hypothesis that zoo visitors will have a more positive perception of zoos. If zoos are able to form positive perceptions for zoo visitors then how can they connect and gain support from the large population of non-zoo visitors? How can zoos promote themselves in order to reach a whole new audience?

**Conclusion:**
Although a major portion of the population visit zoos on a routine basis, there is still a large portion that does not; the non-zoo visitors. However, this does not necessarily mean that non-zoo visitors have a negative perception of zoos. Many people are disconnected from zoos due to a lack of interest. Perhaps they are viewed as recreation for children, rather than living museums for all ages to experience? Perhaps many people have misconceptions of animal welfare and the mission zoos promote? There will always be a portion of the population that disagrees with the purpose of zoos and the idea of animals in captivity and so if zoos are to take advantage of this large pool of potential patronage, strategic planning must take effect. Zoos must reach out into the community and promote the positive work they are doing. In this modern world of animal activists, zoos will have to fight to promote their missions through education. Studies like this will help gauge public perception of zoos. Recognizing how the public perceives animals in captivity is important for zoos to consider when developing educational programming and marketing. There is power in numbers so gaining the support and respect of the local community will help zoos win the fight for establishing themselves as places of education and conservation.

**References:**
Four passionate keepers and one passionate vet tech formed the Akron Zoo Chapter of AAZK in March of 2014. It was because of those five people taking a chance that we became the 100th Chapter of AAZK and we hope to do great things with that honor. Our Chapter members started out as only zoo keepers but we have expanded that to now include almost every department of our zoo. We have members from Food Service, Finance, Collections Managers, Vet Staff, and our volunteers the EdZoos. Through the support of our members and the rest of the zoo staff we have been able to do some really amazing things thus far as a Chapter.

Since we got a late start in 2014 we were only able to do one conservation fundraiser, a Rummage for Rhinos sale to support Bowling for Rhinos. Rummage sales take a lot of work, but even on one of the rainiest days of the year we were able to raise $1,594.30 in a few short hours. In 2015, we continued the Rummage for Rhinos sale because it was successful and due to increased advertising, and nicer weather, we were able to increase that amount to $2,486.57 making our two year total over $4,000. Even though nobody in our Chapter has ever worked with a rhino we know Bowling for Rhinos is a wonderful event helping many endangered species and we are happy to support it each year. In 2016 we are planning a 5k for our BFR fundraiser titled Rush for Rhinos, because it is literally a rush to save the species. Because Akron is a huge running community we feel it will be a great fundraiser.

We also hosted two other conservation fundraisers in 2015, one for the Red Wolf Coalition and one for Cans for Corridors. At the Akron Zoo we have 1.1 Red Wolves and we all know the conservation of this species is under a lot of scrutiny and can use all the help it can get. With the help and support of a local business named Wolf Creek Winery we decided to host an event there called Wine for Wolves. Each person who bought a ticket received a drink of their choice, snacks, desserts, and a tour of the wine cellar. Through ticket sales, raffle tickets, and a percentage of additional drink sales we raised a whopping $3,069.55 for Red Wolves! This is a fundraiser we hope to organize again next year because it was so successful.

The last conservation campaign we have been supporting is Cans for Corridors, a recycling initiative created by the Durrell Wildlife Park in order to establish tree corridors in Brazil. Money from recycled aluminum cans is used to buy, plant, and maintain tree saplings in the Brazilian Rainforest. Cans for Corridors has teamed up with IPE in Brazil to focus on tree corridors that will benefit the endangered Black Lion Tamarin. Their population is very fragmented and there is not a stable population currently in zoos. Our Chapter began collecting cans as members in 2014 and it has now spread to monthly can drives in our zoo parking lot for staff, volunteers, and the general public! It has been slow to pick up steam in the general public but we now have school kids, dance teams, pre-schoolers, and a Cross-Fit gym collecting cans for us. We have currently raised $552 dollars from just simply recycling cans! Cans for Corridors estimates that every $0.75 equals one tree planted meaning we have helped to plant 736 trees thus far! We will continue to grow this fundraiser through advertising because we are not only helping to save the rainforest but we are promoting recycling in our community which is something that everyone can do to help! We feel our first two years were a success and we look forward to the future where we hope to increase our membership and the amount of money we can raise for conservation. If any other AAZK Chapters are interested in starting to help support Cans for Corridors please feel free to e-mail Lauren Starkey at laurens@akronzoo.org for more information!
Ratite Enrichment Options

Dana Urbanski
North Carolina Zoological Park and
Alexandra Zelazo-Kessler
Virginia Zoological Park
Abdominal Ultrasound Training with 0.3 Angolan Colobus Monkeys

Ricca DuCharme, Primate Keeper
Disney’s Animal Kingdom® Orlando, FL

Introduction
The 1.2 Angolan colobus monkey (Colobus angolensis palliates) group at Disney’s Animal Kingdom® (DAK) has presented some unique training challenges for the Primate-Carnivore Team over the past three years. When these individuals first arrived at DAK in 2008, they had very little training experience and were slow to build trust with keepers. Despite the monkeys not having a solid training history, the keepers set out to train abdominal ultrasound with one female due to medical complications from a difficult birth. In this situation, the ultrasound behavior was shaped and utilized as a tool to monitor a vaginal-bladder fistula.

By training this behavior, the number of immobilizations were minimized, which also decreased stress to the animal. Shortly thereafter, ultrasound was also used to identify pregnancies in two other females in the group, as well as to obtain fetal measurements. This allowed veterinary staff to monitor these pregnancies more closely, which was a priority that resulted from the previously mentioned complications from a difficult birth.

Purpose of Training
Abdominal Ultrasound
The abdominal ultrasound behavior was initially identified as a potential goal when one female developed a significant fistula as a result of dystocia during the birth of her second offspring. Prior to the diagnosis, the female was leaking urine and developed serious urine burns to her perineum and ischial callosities. Through the use of cooperative ultrasound imaging, the vet staff was able to identify the cause of the problem and take a targeted surgical approach to treatment and aftercare.

In order to facilitate appropriate body placement for the ultrasound behavior, a plastic wood board, approximately 1.5 inches wide, was attached to the front of the 2x2 inch mesh via zip ties in an area with no other perch or bench. This setup required the monkeys to cling to the mesh with both hands and feet to ensure suitable proximity to the mesh. Keepers quickly found that the monkeys would sit too far back from the mesh if stationed on a bench. The keepers then shaped the proper positioning by having the monkeys target their feet to the keepers’ hands and gradually spreading out their feet. Due to one of the female's tendency to grab during training, the keeper attached small mesh to this area so that she could not reach through. Keepers began desensitizing the monkeys to the ultrasound probe by touching their abdomens with a wooden dowel and then progressing to a Doppler probe with the power turned off to simulate the cord of the ultrasound probe. This helped to minimize the potential of the monkeys damaging the expensive ultrasound probe during the initial shaping stage.

Shaping the Behavior
Although the first two females had little training experience prior to working on the ultrasound behavior, they were comfortable separating and stationing at the mesh in their holding stalls for keepers. All members of the colobus group were stationed at the mesh daily, performing behaviors such as standing at the mesh, hand presentation and foot presentation, as well as taking food by mouth so keepers could assess their health and maintain a positive keeper-animal relationship.

Each female had her own designated trainer who shaped the behavior, adjusting the training plan as needed to maintain animal comfort. It was extremely important that each monkey have a primary trainer she trusted and was comfortable with. Once the behavior was trained to maintenance level, the behavior was passed on to a few other trainers to allow for more flexibility with scheduling ultrasound assessments.
the behavior was shaped, a member of the veterinary and managerial personnel. Initially, training sessions were short and reserved the most space for success. The keepers kept the training sessions short and reserved the most time for success. They worked directly with the animal while the vet staff directed the keeper regarding probe placement on the animal’s abdomen so that the vets could obtain appropriate images and measurements. A primate manager was also present if the ultrasound machine was being used, to aid in communication and to assist the keeper if needed. The team established common terminology for communicating instructions for adjusting the probe placement so that any vet could efficiently communicate with any trainer. Managers also became familiar with the desired images so they could assist new trainers with probe placement prior to a session with a veterinarian.

Conclusion

Although the Angolan colobus group had minimal training experience when they arrived at DAK and the monkeys were slow to adjust to their new training program, keepers were able to successfully train abdominal ultrasound with three females. By establishing positive relationships with the animals and building on a basic training program, a complex husbandry behavior was achieved in a short period of time, thus improving the care of all animals involved.

BHC comments by Beth Stark-Posta

With such a strong focus on promoting excellent animal welfare, many zoos today are turning to positive reinforcement training to promote voluntary participation of the animals in their own care. This project exemplifies the benefits of a strong training program that focuses on a positive keeper-animal relationship. Building mutual trust is an investment that pays off in the long run, as seen in this example. Not only were the animals trained for pregnancy confirming ultrasound, but one was also able to receive a diagnosis without the need for immobilization. This type of training, as well as other training projects that involve the animals in their care, can go a long way to ensuring that we continue to promote excellent welfare in our zoo and aquarium animal residents. Congratulations on a job well done – and thanks for sharing your successes with us!

We want to hear your Training Tales – the good, the bad and the fabulous!

Please submit your “Training Tales” and experiences in operant conditioning to share with Animal Keepers’ Forum readers. This opportunity provides a convenient outlet for you to exhibit your training challenges, methods and milestones with the AAZK member network. Please submit entries based on the following guidelines:

Submit a brief description of a training project at your facility. These can be 500 words or less, in text or bullet points – it can be longer (up to 1000 words); however, short and simple descriptions with a few images are just as perfect. Details should include the following:

► Define the training goal (what did you try to do and for what purpose?)
► List important steps (How did you do it – include plans that changed along the way/what worked and what didn’t work)
► Timeline used (how long did it take)
► Tips you learned along the way
► Include 3-5 digital photos that clearly depict the animal in the learning process or performing the desired goal (provide photo caption and photographer of each image). Photos need to be 300 dpi and at least 1200 x 1800 pixels.

Please send submissions or questions to:
Kim Kezer at kkezer@zoonewengland.com or Shane Good at shane.good@aazk.org
(Use Training Tales Submission as the subject).
Engaging Citizen Scientists to Determine Disease Prevalence at Long Branch Nature Center in Arlington, Virginia

Lauren Augustine and Matthew Neff
Department of Herpetology, Smithsonian National Zoological Park
3001 Connecticut Ave. NW, Washington DC 20008
Augustinel@si.edu
Neffm@si.edu
Citizen science enlists the public in collecting data for scientific purposes and is a tremendous method of expanding the breadth of any project. Developing and implementing projects that utilize public participation can produce both scientific and educational outcomes (Bommey et al., 2009). Citizen science projects are generally designed to provide amateurs a role in science and in return the participant receives an educational benefit (Silvertown, 2009). Data collected by the public has been used to assess population trends, range changes, and shifts in phenologies (Bommey et al., 2009). Data collected has also led to investigations into climate change, invasive species, ecological restoration and water quality (Silvertown, 2009). This project aimed to increase public awareness about the threats of emerging infectious diseases on local herpetofauna. Emerging diseases are responsible for population declines in both reptiles and amphibians worldwide. *Batrachochytrium dendrobatidis* (*Bd*) is a fungus that causes an infectious disease called chytridiomycosis. There is evidence that extinctions and declines in amphibians are linked to the highly transmissible amphibian chytrid fungus, *Bd* (Skerratt et al., 2007). Amphibian chytrid fungus affects the epidermal cells of amphibians (Brem et al., 2007; James et al., 2009) disrupting the cutaneous osmoregulatory function of the infected individual leading to electrolyte imbalance and death (Voyles et al., 2009). The spread of this virulent disease is causing rapid amphibian declines in many parts of the world. *Ranavirus*, when seen in amphibians, causes highly contagious infections. It is usually associated with amphibians that breed in standing water (Harp and Petranka, 2006) and can affect both larval and adult individuals (Gray et al., 2009). *Ranavirus* appears as swelling in the limbs or body, reddening of the skin, and susceptible amphibians usually succumb to chronic cell death (Gray et al., 2009). Transmission of this pathogen occurs through direct contact with infected individuals, ingestion of infected tissue, and indirectly by contact with infected water or soil (Gray et al., 2009). This virus also affects reptiles and has been seen in wild populations of turtles and tortoises in the United States. The effects of this disease are less clear than that of *Bd*, but infections are being identified in new populations and are more geographically spread than previously thought (Johnson et al., 2008).

Amphibian chytrid fungus and *Ranavirus* have been documented in Virginia (Olson, http://www.bd-maps.net/), but Long Branch Nature Center (LBNC) has not been tested for either disease. LBNC is located in urban Arlington, Virginia and is home to an abundance of wildlife, herpetofauna in particular. LBNC sees up to 12,000 visitors walk through their doors annually and the 17 acre park joins up with Glencarlyn Park for a continuous 122 acres. This park has never been surveyed for emerging diseases and acknowledges the value in this type of research. Through collaboration, this project has the potential to reach a wider scope of individuals both at the zoo and nature center. Additionally, being partially funded by the Virginia Herpetological Society will ensure the dissemination of this critical information to their membership.

This study sought to use citizen scientists to determine the presence or absence of amphibian chytrid fungus and *Ranavirus* in as many species as possible at LBNC. We aimed to swab individuals from eight species of amphibian that occur in LBNC: American bullfrog (*Lithobates catesbeianus*), wood frog (*Lithobates sylvaticus*), green frog (*Lithobates clamitans*), spring peeper (*Pseudacris crucifer*), red-backed salamander (*Plethodon cinereus*), northern two-lined salamander (*Eurycea bislineata*), three-lined salamander (*Eurycea guttolineata*), and spotted salamander (*Ambystoma maculatum*). Individuals from the National Capital American Association of Zoo Keepers (NCAAZK) were invited to participate as a part of their local conservation outreach and education program. NCAAZK members are already conservation-minded individuals, but many zoo employees lack the opportunity to get in the field and conduct scientific research. Participants received in-depth information about the threats to local herpetofauna, thus providing an opportunity to conduct disease screening while educating the members of NCAAZK about emerging diseases in reptiles and amphibians.
Long Branch Nature Center was surveyed nine times between August 2014 and June 2015 to maximize the number of species sampled. For example, species such as *A. maculatum*, *L. sylvaticus*, and *P. crucifer* breed in late winter to early spring and usually aren't encountered other times in the year. Out of the 53 *Bd* and *Ranavirus* swabs that were completed, only 2 *E. bislineata* were positive for amphibian chytrid fungus.

Throughout the course of the project, a total of 25 people from the Smithsonian’s National Zoological Park, Long Branch Nature Center, and the Virginia Herpetological Society participated and learned about infectious diseases. The educational scope of this project far exceeded expectations. Not only were we able to conduct important disease screening at Long Branch Nature Center, but also helped educate park guests that were encountered during our field work. An important aspect of research and conservation is educating the general public. By creating a hands-on experience for our citizen scientists, we believe the message about emerging infectious diseases and the conservation of our local herpetofauna was effectively communicated. Furthermore, this project was able to provide valuable disease ecology information to LBNC, aiding in future park management decisions.

**Acknowledgements:**
We would like to thank the American Association of Zoo Keepers, the Virginia Herpetological Society and Long Branch Nature Center for funding this research. We would also like to thank the staff of Long Branch Nature Center, the staff of the Reptile Discovery Center at the Smithsonian’s National Zoo, the National Capital American Association of Zoo Keepers (NCAAZK) and the other individuals who participated in this field work.

**References**


Wildlife Toy Box is a product line created by Desert Plastics to assist professional animal management personnel and professional facility management personnel in their efforts to provide engaging, creative, and cost-effective products. These will range from direct animal contact products, both on and off exhibit, to products intended for use in general public areas.

We are committed to providing quality, high-value products manufactured from a range of materials.

“Helping professionals mold enrichment”
Lyon Technologies Inc. is the official North American Distributor of the Grumbach Incubator GmbH. One of the world's most trusted and innovative incubators. With their low temp variation, automatic humidity controls, and digital thermometer and hygrometer, these units are a precision instrument designed to give you the best hatch rates possible.

For More Information and Free Catalog: www.lyonusa.com 1888-LYON-USA

Lyon Technologies is a leader in the design and manufacture of animal health care equipment including intensive and critical care units, incubation, and anesthesia and oxygen therapy; providing solutions to customers in over 100 countries since 1915.

Follow us on LinkedIn facebook.com/lyonttechnologies
Central Nebraska Packing, Inc. offers:

**Classic** & **Premium** Frozen Carnivore Diets

- Also Available -
HORSE SHORT LOINS / HORSE & BEEF BONES
MEAT COMPLETE WITH Taurine (Raw Meat Supplement for all Carnivores)

Member: AZA | AAZV | AAZK

**NEBRASKA BRAND**

877.900.3003 | 800.445.2881
P.O. Box 560, North Platte, NE 69103-0560
info@nebraskabrand.com • nebraskabrand.com

FELINE & SENIOR FELINE | BIRD OF PREY | CANINE | SPECIAL BEEF FELINE