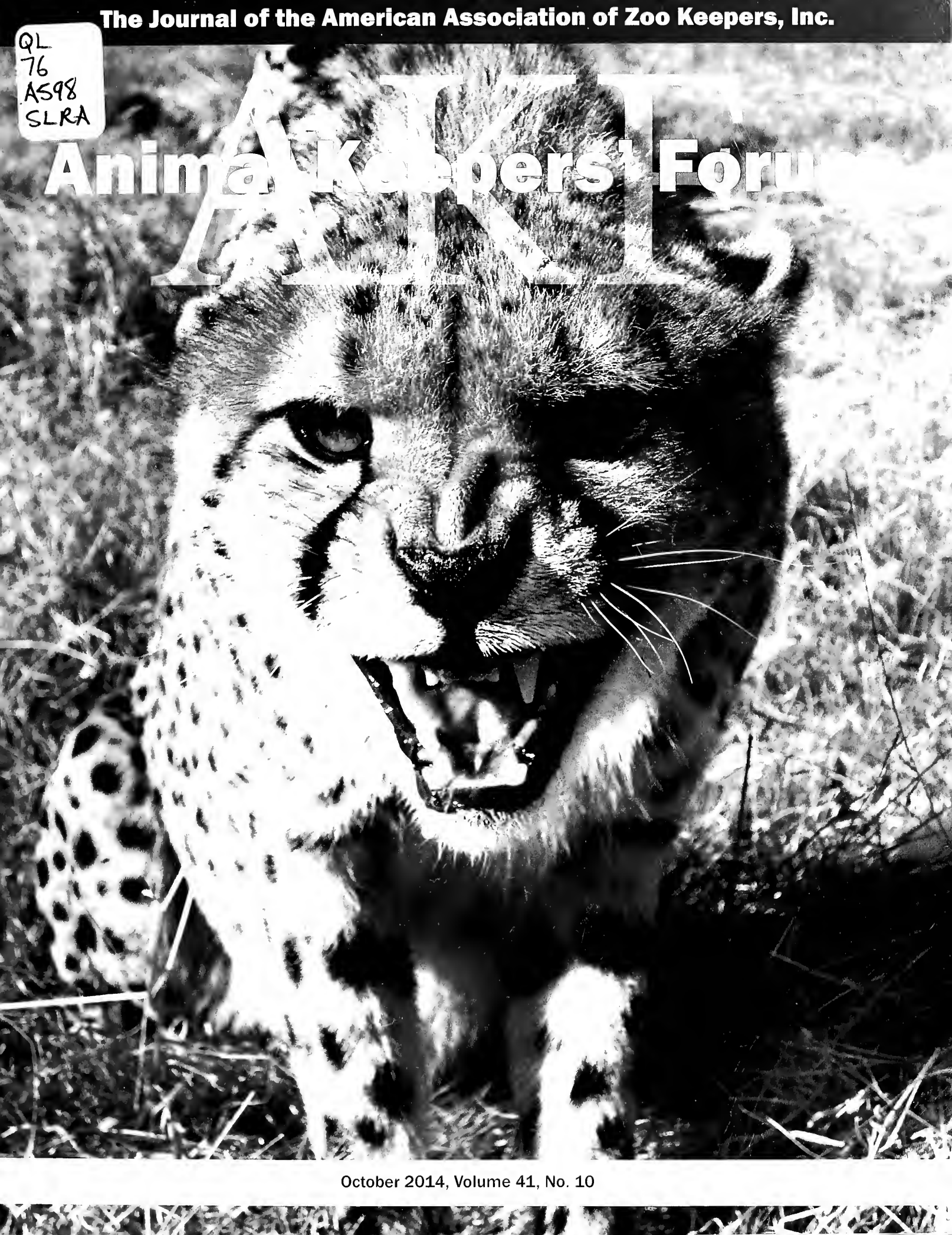


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**269 ABOUT THE COVER**

**270 FROM THE PRESIDENT**

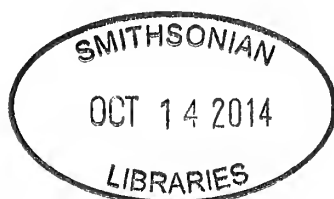
**273 COMING EVENTS**

**FEATURED ARTICLE  
274-276**

*The Growth and Development of Two Hand-reared  
Cheetahs at Wildlife Safari*  
**Beth Benjamin**

**AWARDS  
278-281**  
AAZK Awards

**282-283**  
AKF Awards



**CONSERVATION STATION  
284-287**

*Zoo Keepers Getting Dirty for Conservation:  
It's Not Just in a Day's Work!*  
**Kym Janke**

**TRAINING TALES  
288-290**

*Training Degus (*Octodon degus*) for better  
management; an account of successes and failures*  
**Cheryl Frederick & Kristen Volpi**



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## 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 a cheetah (*Acinonyx jubatus*) by Kym Janke of the San Diego Chapter of AAZK. This photo was taken in Kenya, and her article in this month's AKF, "Zoo Keepers Getting Dirty for Conservation..." was inspired by her time doing volunteer work for the Cheetah Conservation Fund in Namibia. It is always educational and inspiring when zoo keepers can find the opportunity to spend time in the field and work *in situ* with wildlife. Hopefully Kym's article inspires more of you to look for ways to dedicate your time to conservation efforts.

The cheetah is the world's fastest land animal and Africa's most endangered cat. With its long legs and very slender body, the cheetah is quite different from all other cats and is the only member of its genus, *Acinonyx*. Today, cheetahs are found in only 23% of their historic African range and are extinct in their Asian range except for a small population in Iran of about 100 individuals. According to the Cheetah Conservation Fund, most of the reasons for the cheetah's endangerment can be grouped into three overarching categories: A.) Habitat loss, fragmentation and degradation, B.) Human-wildlife conflict, C.) Illegal wildlife trade.

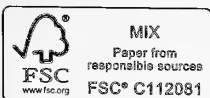
If you are interested in learning more about cheetah conservation, you can visit the Cheetah Conservation Fund's website at [cheetah.org](http://cheetah.org). You can also participate in **Bowling for Rhinos**. Proceeds from BFR directly support our partner Action for Cheetahs in Kenya and their website can be found at [actionforcheetahs.com](http://actionforcheetahs.com).

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@aaazk.org](mailto:shane.good@aaazk.org). If you have questions about submission guidelines, please contact the Editor. Submission guidelines are also found at: [aaazk.org/akf-submission-guidelines/](http://aaazk.org/akf-submission-guidelines/).

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## FROM THE PRESIDENT

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*It's easy to make a buck. It's a lot tougher to make a difference.*

-Tom Brokaw

### **An Organization's Journey of Self-Discovery**

During the 2014 Conference in Orlando, I presented our Board of Directors and Chapter leaders with a very simple question: What is the "bottom line" of our organization in its simplest form? The "bottom line" is our mission and if we could simplify our reason for being, our purpose, and in the end, what we want to be remembered for, it comes down to a very simple phrase: **We change lives**

If you consider the four divisions of our organization, it's not hard to find the many ways that lives are changed through our organization. Consider the following examples:

### **COMMUNICATION**

- *Animal Keepers' Forum* (AKF) provides current articles on improving animal care and bettering our skills as animal care professionals and conservationists.
- The Communication Committee, newly formed this year, is dedicated to providing communication through e-blasts, social media and on-line content
- AAZK Online, our Collaborative Learning Environment, provides an opportunity for Chapter Officers, AAZK Committees and Programs, and Conference attendees to network, create discussions, and share resources. For the first time in our conference history, conference attendees are connected with the conference, workshops, and each other.

### **CONSERVATION**

- *Bowling For Rhinos* (BFR): Since its genesis as a National Program in 1990, BFR has generated over \$5 Million for rhino conservation. Last year AAZK raised over \$481,000 and if our projections for this year are accurate, we will be well over the \$500,000 mark
- Conservation Committee provides updated information regarding opportunities to engage in *in situ* conservation. This committee also selects the winner of the BFR Conservation Resource Grant and the Certificate of Merit in Conservation Award.

### **EDUCATION**

- Both the Professional Development (PDC) and Behavioral Husbandry (BHC) Committees strive to bring our membership resources through AAZK Online and our annual conferences. Dedicated workshops, designed to help you improve your skills as an animal care professional have been in place since the 2011 conference.
- AAZK Online provides learning opportunities through online learning modules through both AAZK and San Diego Zoo Global Academy.
- Certification workshops had their debut recently at the Orlando 2014 Conference. AAZK will continue to provide two 12-hour certification workshops at every conference.
- The AKF is a continuous resource for animal care providers on enrichment, husbandry, and all other aspects of animal care.

### **RECOGNITION**

- Each year, the Awards Committee recognizes excellence in animal care and leadership.
- Over \$5000 in grant funds are awarded each year by the Grants Committee
- National Zoo Keeper Week is a national program. We are still looking for a Program Manager who can lead the Association in helping Chapters and Institutions recognize animal care professionals. Originated by AAZK, National Zoo Keeper Week highlights your profession during the third week in July.

### **Forging ahead to make a difference**

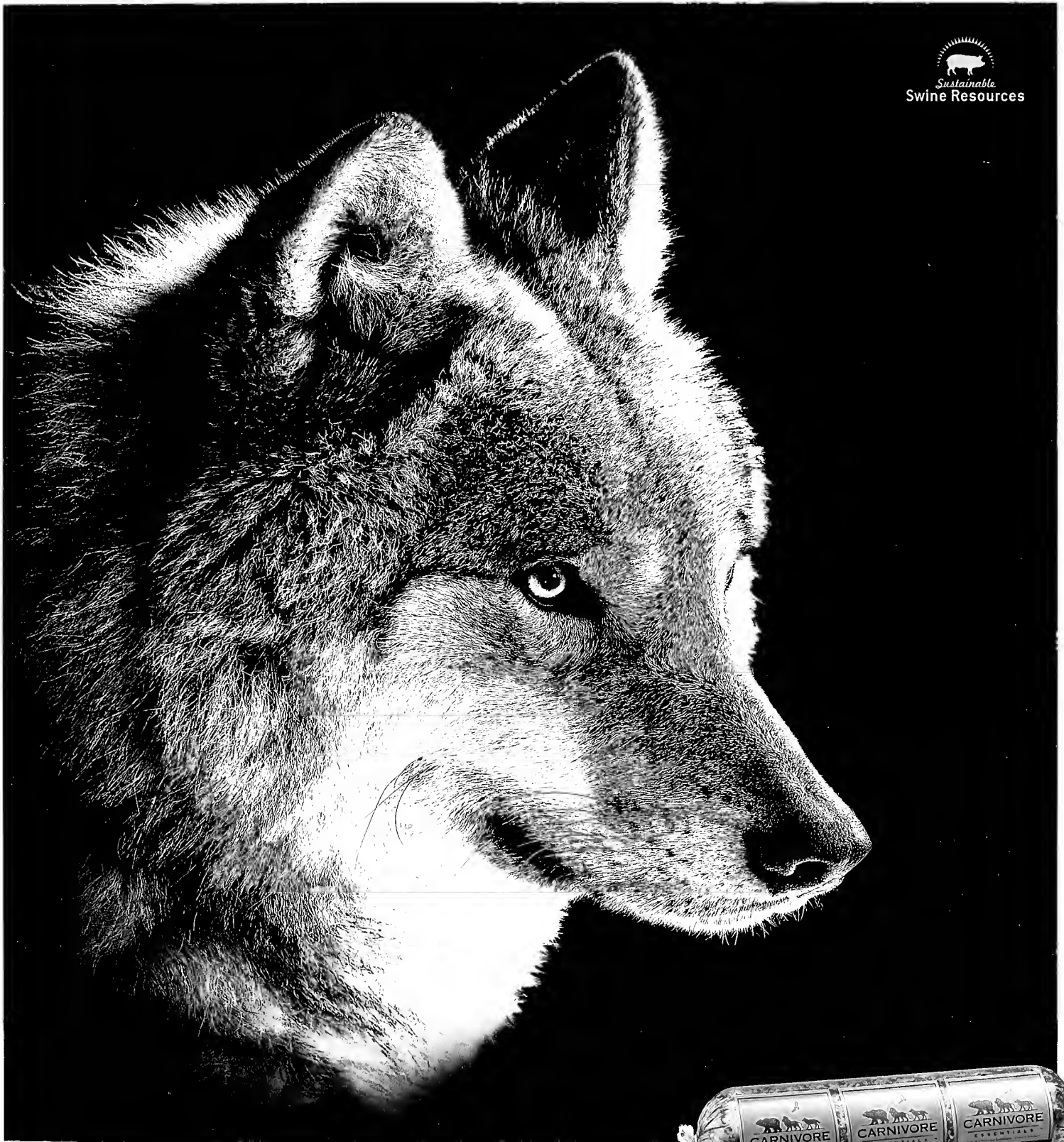
We change lives. That's our bottom line. What we do as an organization centers on helping you in your profession, providing you with opportunities for growth and success. Our vision is to be the leader in the zoo and aquarium industry, fostering professional development and personal connections that advance animal care, animal welfare and conservation. As we work towards that vision, our commitment to our membership will hopefully impact our profession in a profound way. The end result is that we help you change lives.

As animal care professionals, we make a positive impact on both the animals we care for and the guests with whom we interact. On a daily basis, through husbandry, exhibition, enrichment, training, and education, we change lives. As an Association, that's our bottom line. As animal care professionals, it's your bottom line too.

As always, I welcome your thoughts and input. E-mail me at [bob.cisneros@aazk.org](mailto:bob.cisneros@aazk.org) ; I would love to hear from you.

*Bob Cisneros*





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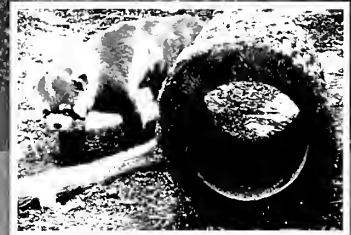
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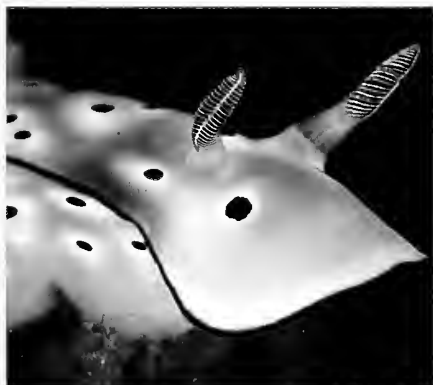
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**April 13-18, 2015**  
**Animal Behavior Management  
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Copenhagen, Denmark  
For more information visit:  
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**September 9-13, 2015**  
**International Congress on  
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Leipzig, Germany  
Hosted by Leipzig Zoo and  
the International Congress of  
Zookeepers (ICZ).

For more information visit:  
[iczoo.org](http://iczoo.org).

**September 17-21, 2015**  
**AZA National Conference**  
Salt Lake City, UT  
Hosted by Utah's Hogle Zoo  
For more information visit:  
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**September 27 - Oct. 1, 2015**  
**AAZK National Conference**  
St. Louis, MO  
Hosted by Saint Louis Zoo and  
St. Louis Chapter of AAZK

More details to come!

# **The Growth and Development of Two Hand-reared Cheetahs at Wildlife Safari**

*Beth Benjamin  
Cheetah Keeper, Wildlife Safari  
Winston, OR*



## CURRENT CASE

On March 1, 2012, 1.1 cheetahs (*Acinonyx jubatus*) born on February 29 were pulled to be hand-reared due to maternal neglect, resulting in low body temperature, weakness, and inability to nurse. The female cub was the stronger of the two, but because maternal instincts were not present, it was deemed necessary to pull both. Wildlife Safari had hand-reared two cheetahs within the past ten years, along with several others in their forty-year history, but there was no set protocol for caring for two at once. A new protocol was developed to specify formula composition, amount, and frequency of feeding, medications/supplements to diets, weights, sleep schedule, keeper bonding, and separation/training time.

## HAND-REARING IN CAPTIVITY

Cheetahs are very difficult to breed in captivity (Wachter et al., 2011), and only a handful of facilities in the U.S. are equipped to do so. Conception rates in captivity are very low due in part to stress induced by human interaction and other improper management techniques (Wielebnowski et al., 2002). Because successful pregnancies are so rare, cubs that are carried to term and are born alive are very valuable. While it is desirable for litters to be mother-raised, it is sometimes necessary for humans to hand-raise them. Reasons for this include maternal neglect, illness, or educational purposes (Bell, 2005). In addition to these factors, hand-rearing may be necessary if the litter consists of only one cub. While the exact reason for abandonment is not known, mothers may reject a single cub due to insufficient production of milk, or to simply become pregnant again and give birth to a larger litter (van Oorschot, 1998).

In looking at the current case, the mother began rejecting the male at one-day-old for unknown reasons. Keepers watched from a surveillance camera as she repeatedly placed him in a corner of the den alone, only allowing the female to nurse. After observing the situation for several hours, it was determined to be in the best interest of the male to be hand-raised. Unfortunately, female cheetahs will not care for a single-cub litter, so the female was pulled as well.

## FEEDING

Because neither cub was able to nurse from their mother for long, they struggled to understand how to take to the bottle. After a few awkward attempts, the female began feeding from the bottle. The male, however, was too weak and was fed with an eye dropper for the first few days before attaching to the bottle's nipple. Both cubs preferred to feed with their bodies at an angle with their front paws off the ground and over time became more enthusiastic about finishing the formula. Throughout the hand-rearing process, each cub received medications, such as Simethicone to reduce excess gas, Metoclopramide to treat nausea, and Laxatone to lubricate the digestive track, as necessary. The initial formula was a mixture of Kitten Replacer Milk (KMR), dextrose water, and tap water. Not much research has been conducted about the nutritional content of a mother's milk (Bell et al., 2011), but KMR is an adequate substitute. Store-bought meat-flavored baby food for humans was introduced at one month of age, which neither cub really enjoyed, and raw meat was offered at 38-days-old. After about a week, each cub was eating the majority of meat offered. At 42-days-old they were exclusively offered meat.

## FORMULA COMPOSITION

Days 2-4: **50% KMR Formula.** 325mL of KMR, 37mL of 50% dextrose water, 288mL of tap water, 2 drops of Simethicone. Keep refrigerated. Fed nine times daily.

Days 5 & 6: **60% KMR Formula.** 325mL of KMR, 25mL of 50% dextrose water, 191mL of tap water, 2 drops Simethicone. Keep refrigerated. Fed nine times daily.

Day 7: **75% KMR Formula.** 325mL of KMR, 12mL of 50% dextrose water, 96mL of tap water, 2 drops Simethicone. Keep refrigerated. Fed nine times daily.

Days 8-10: **85% KMR Formula.** 325mL of KMR, 6mL of 50% dextrose water, 51mL of tap water, 2 drops Simethicone. Keep refrigerated. Fed nine times daily.

Days 11 & 12: **95% KMR Formula.** 325mL of KMR, 2 mL of 50% dextrose water, 15mL of tap water, 2 drops Simethicone. Keep refrigerated. Fed eight times daily.

Days 13-41: **100% KMR Formula.** 325mL of KMR, 2 drops Simethicone. Keep refrigerated. Fed seven times daily. Dropped to 6 feedings/day at 22-days-old, then 5 feedings/day at 29-days-old. Meat-flavored baby food offered (33g) at 29-days. Raw meat offered (60g) at 35-days. Dropped to 3 feedings/day at 43-days.

## AMOUNT FED DAILY

The amount of formula offered each day was based on cub weight. Each cub received 20% of his or her body weight, and this amount was evenly divided between the number of feedings each day. To ensure that the cubs were gaining weight at a healthy rate, "ideal weight" was determined each day by calculating a 5% increase in weight from the previous day.

## WEIGHTS

### Mchumba (0.1)

Day 1 = 540.0g	Day 16 = 1002.0g	<b>WEEKLY</b>	
Day 2 = 520.0g	Day 17 = 1030.0g	Day 37 = 2190.0g	Day 135 = 11.34 kg
Day 3 = 540.0g	Day 18 = 1050.0g	Day 44 = 2410.0g	Day 142 = 11.57 kg
Day 4 = 560.0g	Day 19 = 1060.0g	Day 51 = 2600.0g	Day 149 = 11.79 kg
Day 5 = 580.0g	Day 20 = 1090.0g	Day 58 = 2990.0g	
Day 6 = 620.0g	Day 21 = 1120.0g	Day 65 = 3.40 kg	<b>Monthly</b>
Day 7 = 660.0g	Day 22 = 1140.0g	Day 72 = 3.85 kg	Day 179 = 13.61 kg
Day 8 = 690.0g	Day 23 = 1170.0g	Day 79 = 4.31 kg	Day 215 = 18.37 kg
Day 9 = 720.0g	Day 24 = 1230.0g	Day 86 = 4.99 kg	Day 245 = 21.77 kg
Day 10 = 760.0g	Day 25 = 1280.0g	Day 93 = 6.58 kg	Day 275 = 24.27 kg
Day 11 = 800.0g	Day 26 = 1340.0g	Day 100 = 7.26 kg	Day 305 = 27.67 kg
Day 12 = 850.0g	Day 27 = 1390.0g	Day 107 = 8.62 kg	Day 335 = 29.03 kg
Day 13 = 900.0g	Day 28 = 1470.0g	Day 114 = 9.53 kg	Day 365 = 29.94 kg
Day 14 = 950.0g	Day 29 = 1480.0g	Day 121 = 10.43 kg	
Day 15 = 980.0g	Day 30 = 1580.0g	Day 128 = 10.43 kg	

### Khayam (1.0)

Day 1 = 480.0g	Day 16 = 860.0g	<b>WEEKLY</b>	
Day 2 = 490.0g	Day 17 = 890.0g	Day 37 = 1890.0g	Day 135 = 10.43 kg
Day 3 = 450.0g	Day 18 = 940.0g	Day 44 = 2190.0g	Day 142 = 12.02 kg
Day 4 = 420.0g	Day 19 = 990.0g	Day 51 = 2420.0g	Day 149 = 12.25 kg
Day 5 = 440.0g	Day 20 = 1020.0g	Day 58 = 2730.0g	
Day 6 = 440.0g	Day 21 = 1100.0g	Day 65 = 3.16 kg	<b>Monthly</b>
Day 7 = 470.0g	Day 22 = 1100.0g	Day 72 = 4.08 kg	Day 179 = 15.42 kg
Day 8 = 500.0g	Day 23 = 1130.0g	Day 79 = 4.54 kg	Day 215 = 19.51 kg
Day 9 = 540.0g	Day 24 = 1170.0g	Day 86 = 5.44 kg	Day 245 = 24.95 kg
Day 10 = 590.0g	Day 25 = 1190.0g	Day 93 = 6.35 kg	Day 275 = 27.90 kg
Day 11 = 630.0g	Day 26 = 1230.0g	Day 100 = 7.03 kg	Day 305 = 29.71 kg
Day 12 = 670.0g	Day 27 = 1280.0g	Day 107 = 7.26 kg	Day 335 = 31.07 kg
Day 13 = 710.0g	Day 28 = 1340.0g	Day 114 = 7.71 kg	Day 365 = 33.57 kg
Day 14 = 780.0g	Day 29 = 1390.0g	Day 121 = 9.30 kg	
Day 15 = 810.0g	Day 30 = 1460.0g	Day 128 = 10.21 kg	

## SOCIALIZATION

To ensure that both cubs bonded equally to their four keepers, rotation schedules were made so that each individual spent the same amount of time with each cub. For the first five and a half months of the cubs' lives, keepers spent 24 hours/day with them. During the first month the focus was on ensuring that they were eating, gaining weight, taking medications, relieving themselves (with the help of stimulation by the keepers), and expanding their motor skills. Because their biological mother was not present and it was not an option to reintroduce cubs after removing them from the birthing hut, keepers took on the role of "mother" as best as possible. After the cubs began gaining strength, keepers began "play" sessions, which consisted of letting the cubs walk on a sterile surface to investigate the room, people (one per cub), and one another. To help form a bond, keepers would scruff the cubs when they had wandered too far, bring them close, and purr as a cheetah mother would. Each individual has a unique purr, and the cubs soon learned to differentiate between their "moms" and other helpers.

It was decided that the two cubs would be raised as ambassadors, meaning that they would be trained to accompany keepers in educating others about their wild counterparts. After allowing time for mobility and human bonds to strengthen, keepers began training at around nine weeks of age. Training consisted of multiple steps, such as stranger socialization, foreign object socialization, and operant conditioning. In beginning these steps, keepers wanted to establish themselves as a comfort zone. If, for example, the cubs were to become stressed out for any reason (i.e. seeing a large crowd, a dog, or umbrella for the first time), they would know to focus on the trainer for support and guidance. This not only helps ensure safety during interactions with the public, but it also helps the cubs to feel safe and at ease in all situations.

After establishing the four core trainers as "comfort zones," cubs were introduced to a wide variety of objects including Boomer Balls®, strollers, umbrellas, flamingos, park mascot, etc. Some of

---

**It was decided that the two cubs would be raised as ambassadors, meaning that they would be trained to accompany keepers in educating others about their wild counterparts.**

---

these things were greeted with curiosity and investigation, while others prompted apprehension and hissing. Regardless of level of unease, however, the cubs would routinely check in with their keepers to make sure everything was alright. In desensitizing the cubs to being around the public, harnesses and leashes were introduced at two months of age to begin taking walks. Once again utilizing the human comfort zones, cubs were asked to only focus on the trainer, thereby ignoring the crowds of zoo guests. This trainer-cheetah bond was extremely important to establish and maintain throughout their ambassador training so as to keep the experience enjoyable and safe for everyone.

A crucial component in training the two ambassadors was the use of operant conditioning. A clicker, which is a commonly used training bridge, was used to shape behaviors (Ramirez, 1999). Keepers started using clicker training when the cubs were

nine-weeks-old and began by forming an association between the clicker and reward (i.e. hear the click, get a piece of meat). From there the cubs learned a range of behaviors helpful for medical procedures, educational outreaches, daily enrichment, etc. Working on establishing new behaviors also helped strengthen the bond between the cubs and their keepers.

One factor that was considered in the raising of the ambassadors was that one was male and one was female. Not wanting them to become too bonded to one another and be traumatized when separation became necessary at sexual maturity, gradual alone time (with a keeper) was introduced. At a month and a half of age, keepers began separating the cubs during feeding time, which was three times per day. Separation time slowly increased over time until each cub spent most of the day (around 18 hours) alone with a keeper. This alone time allowed for the keeper-cub bond to strengthen, but due to over-representation of his biological mother's genes, the male was neutered at almost nine months of age. After being neutered, cubs once again spent most of their time together.

Today the cubs are thirteen-months-old and are still living at Wildlife Safari continuing their ambassador training. Their biological mother went on to give birth to a litter of three females in June of 2012 and has been very attentive to them from day one.

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# Lifetime Achievement Awards



**Nancy Reinert,  
Disney's Animal Kingdom**

Nancy Reinert's zoo career began 25 years ago on Disney's Discovery Island with a diverse collection of mammals, birds and reptiles. At times she worked around-the-clock on the island and had to be a "jack of all trades" to do what was needed. In addition, she took it upon herself to manage the commissary and attend Cornell University's Nutrition

Certification Program to ensure that the feeding of animals was in alignment with their nutritional requirements. She mentored interns and was a champion for team building and making work a positive place to be. In the late 1990s she transferred to the Animal Nutrition Center in preparation for the opening of Disney's Animal Kingdom. With her promotion to Nutrition Assistant specialist, she was instrumental in training and coaching all the cast and helped establish Standard Operating Guidelines and training checklists. She was very supportive of diet and preparation changes and their implementation when a Nutritionist came on board.

Nancy has been involved with many projects supported by Disney's Wildlife Conservation Fund. She was awarded a Disney internal grant which supported the Florida Scrub Jay Project in Clermont, FL and bought building materials for the NatureFest at Lake Louisa State Park to teach children and families about wildlife. She has collected items for the Center for Great Apes Sanctuary in Wauchula, FL.

She has been an integral participant in organizing and running the BFR event each year, the annual fund raising yard sale and has served on the Turtle Survival Alliance Conference Team for ten years. She has been awarded the Presidential Volunteer Award several years in a row for her volunteer hours to the Groveland Senior Center, Disney BlanketEARs who craft for the community, Toys for Tots and Gift for Teaching.

Nancy not only has been a hero to those who worked with her, but to the causes that she supported including the American Association of Zoo Keepers.



**Jean Ragland,  
Woodland Park Zoo**

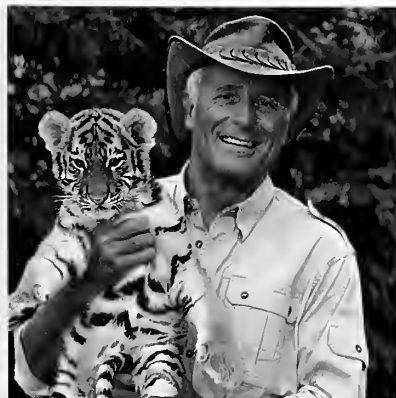
Jean Ragland began her zoo career in 1987 at the Woodland Park Zoo in the Animal Health Department and moved on to Waterfowl, Family Farm, Primates, Elephants, Raptors, The Northern Trial and Australasia. She mentored volunteers, gave educational presentations and assisted in research projects. On a six months job exchange

with the Healesville Sanctuary in Australia, she specialized in Australian flora and fauna. Beginning in 1998 at the Louisville Zoo she worked as a commissary keeper, Animal Department Assistant, night keeper where she was the liaison with local law enforcement, animal control and fire department to handle on-grounds, off-hours emergencies and primary primate and primary elephant keeper.

In 2002, she became the lead mammal keeper at the Cougar Mountain Zoo where she introduced operant conditioning training as a husbandry and educational tool and increased the visibility and scope of the animal enrichment program. In 2005, Jean returned to the Woodland Park Zoo where she worked as a night keeper and a day keeper in Savanna ungulates, giraffe and Raptors. In the Australasia Willawong Aviary, an educational, public interactive experience with Australian bird species was provided.

Besides her keeper duties, she has volunteered in various *in situ* wildlife projects in Australia and participated in zoo and AAZK fundraising efforts.

For twenty-seven years, Jean has remained passionate about her work and has provided the best possible care for animals under a wide variety of area responsibilities.



## Honorary Lifetime Achievement Award

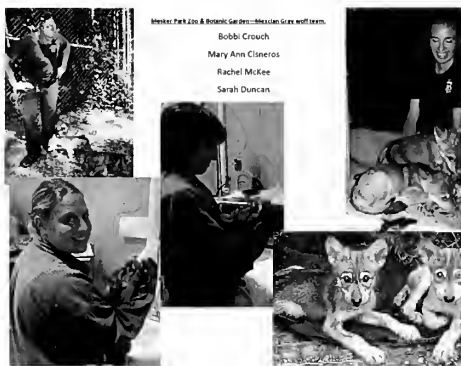
**Jack Hanna, Columbus Zoo**

This award is in recognition of his contribution to AAZK and Bowling For Rhinos. Jack has devoted his life to educating people about the need to preserve and protect animals of all kinds. His support for BFR through his Public Service Announcement will provide a continuous endorsement for our signature conservation event. For his distinguished commitment as a champion for conservation through his public support for BFR, it is with both pleasure and honor that we bestow this award to "Jungle" Jack Hanna.



**Lutz Ruhe Meritorious Achievement - Professional of the Year Award**  
**Lauren Augustine, Smithsonian's National Zoo**

This award is in recognition of her outstanding commitment to professionalism during her distinguished career as a zoo keeper. Specially noted is her work leading the local conservation initiatives for the AAZK Chapter and the zoo, founding Chopsticks for Salamanders and conceiving the idea of a small conference to give first-time presenters a chance to present in a small comfortable environment. She is also a prolific researcher, publisher and professional presenter, the SSP Coordinator for *Cuora galbinifrons* and serves on the AAZK Conservation Committee and the National Zoo's Professional Development Committee. Lauren embodies the AAZK mission to advance animal care, promote public awareness, enhance professional development and contribute to local and global conservation.



**Jean M. Hromadka Excellence in Animal Care Award**  
**Mexican Gray Wolf Team, Rachel McKee, Mary Ann Cisneros, Sarah Duncan and Bobbi Crouch, Mesker Park Zoo & Botanic Garden**

This award is based on the Mexican Gray Wolf Team of four keepers for putting in over seven hundred hours during the hand-rearing of 2.0 Mexican gray wolf pups and their fostering to the adult pair of wolves. The pups they helped salvage from certain death and place in a family pack were the highest mean kinship pups in the program. The efforts of these four talented keepers will have a lasting effect upon the genetics of the Mexican gray wolf.

**Certificate of Merit for Zoo Keeper Education Award**



**NCAAZK Mini Regional Conference Committee, Lauren Augustine, Colleen Bernard, Elise Bernardoni, Hilary Colton, Chelsea Grubb and Kenton Kerns, Smithsonian's National Zoo**

for hosting the 2014 one-day regional conference "The Science Behind Animal Keeping" comprising 17 formal presentations and 25 poster presentations. It increased sharing and cooperation between local institutions, provided zoo professionals a comfortable venue to practice presentations and to give zoo professionals an opportunity to socialize with their peers.



**CuriOdyssey**

for providing opportunities for staff to further their education and skill with a conference budget for four Wildlife Staff to attend conferences, workshops and conservation training. Keepers can also work with the Western Pond Turtle field researchers through Sonoma State University. Monthly Brown Bag lectures and activities enrich and engage the staff. CuriOdyssey also supports the AAZK Chapter by offering its grounds and buildings for meetings and mini-conferences.



**Puget Sound Chapter of AAZK, Woodland Park Zoo**

for dedicating its time and resources to further knowledge, skills and abilities of its members through three grant-based programs, networking with neighbor institutions and a webinar lecture series. The Conservation Grant is used for field-based projects with emphasis on individual participation. The Professional Development Grant is used for conferences, classes, seminars or research projects. The Heidi Fund can be used in a variety of ways.





## Certificate of Merit in Conservation Award

**Kathy Brader, Smithsonian's National Zoo**, for creating the only "Meet a Kiwi" program in the United States where visitors can observe the brown kiwi up close and learn about their conservation. Kiwi in zoos are rare and under her care and instruction, the zoo has hatched and raised six kiwi between 2005 and 2012. She works closely with the New Zealand Embassy and the New Zealand Department of Conservation and is the SSP coordinator and studbook keeper for all brown kiwi outside of New Zealand.

**Matt Neff, Smithsonian's National Zoo**, for starting a Frog Watch Chapter which monitors several DC metro area sites. Under his leadership of the salamander ambassador project, the group raised just under \$50,000 for a new salamander exhibit. He is dedicated to helping the Turtle Survival Alliance, the Orianna Society, Chopsticks for Salamanders, teaches conservation classes for the Friends of the National Zoo and applied for grants to fund emerging disease research at a local nature center.

**Norah Farnham, Woodland Park Zoo**, for founding and running Zoos for Environmental Conservation at the Lincoln Park Zoo. At the Woodland Park Zoo she began Bowling for Rhinos with the AAZK Chapter and spearheads efforts to support Lewa's local schools with basic supplies. At Lewa, she guides groups to view where conservation dollars are turned into concrete conservation efforts.

**Certificate of Appreciation**  
**Disney's Animal Kingdom**  
 2014 AAZK National Conference  
 Host Institution

**Distinguished Service Award**  
**Greater Orlando AAZK Chapter**  
 2014 AAZK National Conference  
 Host Chapter

**Chapter of the Year**  
**Puget Sound AAZK Chapter**  
 Woodland Park Zoo

## Certificate of Recognition

- **Jack Hanna, Columbus Zoo**, for your promotion of AAZK's Bowling For Rhinos through your Public Service Announcement video. Your endorsement of our flagship conservation program will be key in the continued success of supporting conservation efforts in both Africa and Asia.
- **Amanda Kamradt, Zoo New England**, for serving as Co-Chair of the Conservation Committee
- **Shelly Roach, Columbus Zoo & Aquarium**, for serving as Chair of the Grants Committee
- **Kerri D'Ancicco, Disney's Animal Kingdom**, 2014 National AAZK Conference Co-Chair
- **Penny Jolly, Disney's Animal Kingdom**, 2014 National AAZK Conference Co-Chair



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Supporting Avian Reproduction in a  
Mixed-Species Aviary  
Deb Dial, Senior Aviculturist  
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Baltimore, MD

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*Let Me Get the Door for You*  
Sarah Smolinski  
Formerly at Roger Williams Park Zoo  
Currently at Omaha's Henry Doorly Zoo



*Using Ethograms to Develop  
Research Skills in Students*  
Jacque Williamson  
Educator, Brandywine Zoo  
Wilmington, DE



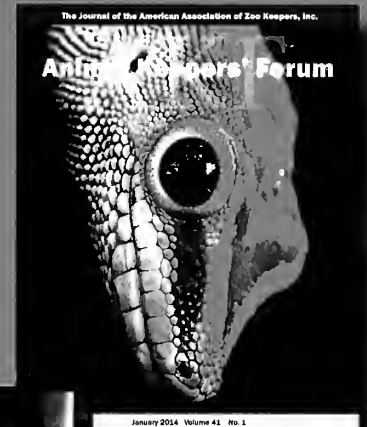
*Keepers Lend a Helping Hand: Training  
Leo for Treatment of his Chronic Condition*  
Judy Sievert, Keeper  
Stephanie Payne, Keeper  
Traci Colwell, Keeper  
Hugh Bailey, Lead Keeper  
Woodland Park Zoo, Seattle, WA

# 2014 AKF Cover Photography Awards



## AKF COVER OF THE YEAR

"Lion"  
 July 2013  
 Meghan Murphy  
 Smithsonian's National  
 Zoological Park  
 Washington, D.C.



## RUNNER UP

"Gecko"  
 January 2014  
 Amanda Westerlund  
 Pittsburgh Zoo and  
 PPG Aquarium



Multiple Snakes, Multiple Problems  
 Janis Gerrits, Animal Keeper (left)  
 Lauren Augustine, Animal Keeper (right)  
 Smithsonian's National Zoological Park  
 Washington, D.C.



*Feeding Browse Year Round  
 in a Northern Climate*  
 Heidi Manicki Claffey, Keeper Grade III (right)  
 Aii Vella-Irving, Keeper Grade III (left)  
 Toronto Zoo

# Zoo Keepers Getting Dirty for Conservation: It's Not Just in a Day's Work!

Kym Janke, Lead Keeper  
San Diego Zoo  
San Diego, CA

Many zoo keepers today view their jobs as much more than just a 40 hour work week where they clock out at the end of the day and turn off all thoughts of work until the next morning. Instead, their work often translates to a lifestyle which displays a great commitment to conservation and animal care that extends well beyond formal work hours. While zoo keeping is an extremely rewarding profession, many keepers still feel the "call of the wild" and desire to contribute to conservation efforts outside of their home institutions by volunteering their time.

Zoo keepers are not the only people interested in volunteering their time for a cause they are passionate about. In fact, volunteer tourism is becoming much more common within the general public



based on their desire to contribute to a variety of causes such as humanitarian efforts, religious foundations and, of course, conservation. Recently, a number of studies have been published examining the volunteer tourism industry and the motivations of participants (Cousins et al., 2009; Ellis, 2003; Halpenny and Caissie, 2003; Konstantinos and Richard, 2009). A large number of volunteer opportunities work with conservation projects and many are available to anyone who wishes to participate, regardless of profession or background. Often these volunteers have not been formally trained in conservation or animal-related fields. Cousins et al. (2009) reported that only 14% (n=22) of the volunteers she interviewed were even members of a conservation or animal welfare organization. This lack of conservation mindedness represents a major difference between the average volunteer tourist and a zoo keeper interested in participating in an *in situ* conservation project; the latter are trained professionals who often have a wealth of prior knowledge concerning the projects for which they volunteer.

Research has shown that a desirable project location (Cousins et al., 2009; Keese, 2011) and the opportunity to get up close and personal with a favourite animal species, can often be linked to the motivations of the volunteer tourist (Cousins et al., 2009). This could mean that conservation is more of an afterthought. A zoo keeper, on the other hand, will likely make their choice based on the conservation potential and credibility of a project. Species preference may certainly play a role in the selection of a project, but this comes from a knowledge and experience standpoint, not simply from a dream to touch a lion, for example.

While numerous studies have been conducted examining the volunteer tourism industry, there has been very little information collected about the role of animal care professionals in these types of working holidays. Most of the literature examining the connections of zoo keepers and independent conservation action focuses on fund raising activities and membership in conservation organizations such as the American Association of Zoo Keepers (AAZK), not on actual hands-on experiences (Hummel, 2009; Poelker & Fischer, 2010). Similar to zoos, which are promoting themselves more frequently as conservation and research organizations and not just entertainment facilities (Carr and Cohen, 2011; Packer and Ballantyne, 2010); zoo keepers are also identifying themselves more often as conservationists. Many zoo keepers will tell you that working closely with a species in





captivity brings about a desire to learn more about that animal in its natural environment. Many improvements to captive animal husbandry can result from learning the behaviours and natural histories of animals in the wild. Keepers are also better equipped to discuss conservation strategies with guests and coworkers if they have experienced them firsthand.

In 2009, I had the opportunity to travel to Namibia for five weeks to volunteer for the Cheetah Conservation Fund (CCF). Having worked with captive cheetahs for seven years, it was an amazing experience to finally see the *in situ* work being done to save these amazing cats! I was so inspired by the work being done by CCF that upon my return home I helped found a local chapter of the organization. After hearing similar stories from many zoo keepers across North America, I began to wonder how large of an impact zoo keepers have in global conservation efforts outside of their professional roles? Is our reach far enough to touch each continent? How can other keepers be inspired to get out there and volunteer as well?

This paper aims to highlight the conservation efforts of zoo keepers in projects around the world and to demonstrate the reach of their impacts. It is my hope that this research can generate excitement and prompt conversation so that more keepers get involved in *in situ* conservation projects themselves.

## METHODS

The free version of the online program, Survey Monkey® was used to create a brief, six question survey that sought to answer some basic questions about the locations of conservation work being performed by zoo keepers. The survey also sought to determine if the conservation actions of the individual keepers led to future partnerships between their home zoological park and the conservation project. Finally, the survey asked if AAZK had provided any support to facilitate the keeper's participation in the project. Survey participants were only asked for their current location and the number of years they had spent working in animal care and were not asked for any identifying information during data collection.

Data collection took place from November 2012 to January 2013 and then again from January to February 2014. The survey was distributed in several different ways. First, a link to the survey was posted on the AAZK Inc. website ([www.aazk.org](http://www.aazk.org)). Additionally, individual Chapters were contacted through



listed e-mail and Facebook pages and asked to distribute the survey to their local membership. Finally, the survey link was made available to zoo keepers through the Facebook groups "ZooKreepers" and "You know you're a zookeeper when".

Using the methods of Seeger and Hertel (2009) as a template, Google Maps software was used to plot the locations (city and country) of conservation projects across the globe where North American zoo keepers have volunteered outside the scope of their professional duties.

## RESULTS

The survey received responses from 59 zoo keepers but seven were removed from data analysis because they had not actually volunteered for an *in situ* conservation project. The remaining 52 respondents contributed to conservation projects on every continent, except Antarctica, encompassing 26 different countries. Several projects received the support of more than one survey respondent and 23 respondents had volunteered for multiple projects. In total, 79 unique projects were supported by zoo keepers volunteering around the globe (Fig. 1).

Respondents reported having between 2 and 31 years of animal care experience, but length of service did not appear to correlate with the number of projects that each individual participated in. Following the *in situ* volunteer period 30 respondents (58.8%) indicated that their experience lead to an extended involvement with the conservation organization. These individual relationships, however, only lead to a partnership between the keeper's home organization and conservation project for 19 participants (38%). Finally, only eight respondents (14.8%) reported that their involvement in the conservation project had been facilitated by AAZK.

## DISCUSSION

Many zoo keepers feel they were destined to work in the zoological field and so have a moral obligation to animal care (Bunderson and Thompson, 2009). Even with this passion for their occupation and a strong belief on the vital importance of conservation, there are two factors that are continually cited as being the reasons that zoo keepers do not volunteer their time for conservation projects outside of their daily duties. The first is a lack of personal funds to finance their involvement and the second is that they may not even realize that there are opportunities for them to become involved.

Many volunteer projects can be an expensive commitment once airfare, meals and lodging are all factored in. Zoo keepers are often paid much less comparatively to other occupations requiring the same level of education. In 2012, the median annual wage for non-farm animal caretakers was \$19,690. While this group includes occupations such as pet groomers and sitters, the figure rises only slightly to \$25,270 per year for persons identifying themselves as animal trainers (Bureau of Labor statistics, 2014). In 2000, a survey conducted by AAZK found that 75% of zoo keepers earned between \$15,000 and \$30,000 (as cited in Crosby, 2001) and it is not unlikely that this remains true today. Despite these income considerations, there are many ways to help offset the costs associated with the volunteer opportunity in order to make the conservation experience possible. For instance, certain organizations like CCF attempt to alleviate the financial burden by offering a reduced fee for food and lodging to zoo keepers. Zoo keepers may be surprised that funding, even if only partial, may be available to them from their home institutions. After all, from a management perspective, improving the knowledge and experiences of staff can lead to an enhancement of guest experience since tales from the field can be exciting and gain the attention of an audience. Additionally, involvement in professional organizations such as AAZK may lead to funding and scholarship opportunities at both the local and national levels of the organization. Finally, keepers may look for local opportunities where travel is not required and they can coordinate their volunteer commitment with their work schedule.

Volunteer conservation opportunities are often not well advertised and so keepers may not realize that an opportunity exists. Additionally, many zoological facilities employ teams of research scientists, separate from their keeper staff, whose formal roles are to participate in *in situ* conservation projects. While most zoo keepers already know of many projects that interest them, the presence of research staff may discourage them from approaching their own supervisors to seek approval for the time off needed to participate in a project themselves. Alternatively, zoo keepers may be discouraged by the ground work needed to arrange a volunteer opportunity if conservation involvement is not common at their facility. It has been my experience that people do not want to be the first to attempt something. In general, people would like some sort of assurance that their requests or goals are attainable before seeking approval. For example, several of my peers have approached me to question the methods I used to gain approval for my professional leave to volunteer at CCF. Some of these keepers have gone on to volunteer for conservation projects themselves, but may not have approached their supervisors without any comparative examples of volunteer involvement in outside conservation organizations. Despite an extensive literature review no studies were found examining the effect of peer involvement on an individual's motivation to join a cause.

The response rate to this study was somewhat disappointing and lower than expected. My target was to have 100 participants and this did not seem to be an unrealistic goal based on the fact that there are an estimated 232,100 zoo keepers in the United States alone (Bureau of Labor statistics, 2014), and over 2600 AAZK members from 250 animal-related facilities. Since responses were only solicited from keepers who had participated in *in situ* work there is no way to determine whether response rate was low due to a general lack of survey participation or due to a lack of conservation participation. If this study were to be repeated it is recommended that all keepers be invited to respond with

the option of answering that no *in situ* work had been done. Future studies should also seek to identify the motivations and prohibitory causes to volunteer involvement.

It was quite surprising that so few respondents had received support from AAZK considering the fact that the majority of data collection was conducted through members of this organization. This raises the question of whether respondents had approached AAZK and been denied funding or if they are unaware of the opportunities available. As AAZK attempts to attract new members and retain their current membership it may be beneficial to examine the knowledge and perception of zoo keepers towards the benefits of AAZK membership. It may also be helpful to examine the opportunities for financial aid at the Chapter level.

The locations of the projects that zoo keepers participated in seem to be clustered in regions of the world that one could consider safe and relatively stable with regards to political and cultural balance. This is in agreement with the findings of Keese (2011), where safety was the number one reason given for the selection of an area by non-governmental organizations participating in volunteer tourism. It would be interesting to investigate in a future study whether zoo keepers tend to volunteer in these established regions due to personal safety concerns or if it is due to the established, readily available opportunities in these regions as opposed to seeking out opportunities in less travelled countries.

## CONCLUSION

Overall zoo keepers are shown to contribute positively to conservation efforts outside of their professional lives, and this willingness to participate is something that many conservation organizations could use to their advantage. Keepers who have participated in conservation projects are encouraged to share their experiences, not only of the actual trip but also the process of planning, with their peers to help guide and inspire others to follow in their footsteps. As more zoological organizations promote conservation as a goal, it may be easier for individuals to acquire support for involvement in *in situ* projects. Hopefully this paper will serve as a tool to open dialogue between keepers and their



The author conducting *in situ* wildlife research.

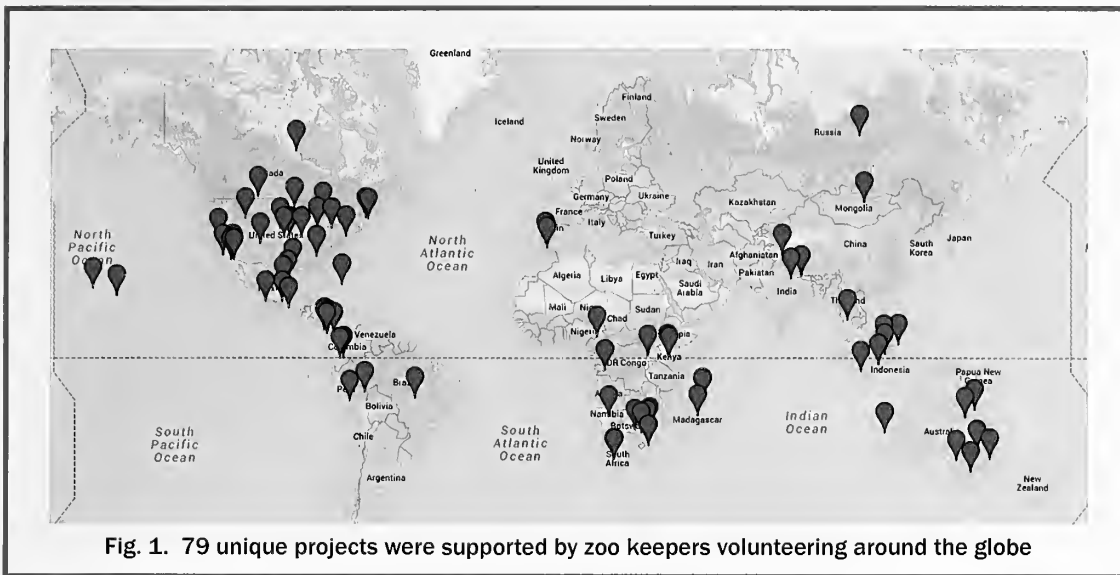


Fig. 1. 79 unique projects were supported by zoo keepers volunteering around the globe

supervisors and allow for additional conservation contributions. In the end all zoo keepers should be proud of their dedication and involvement with conservation issues, as we are clearly making a difference both at home and away! Where have you dreamed of making a difference?

**ACKNOWLEDGEMENTS**

I would like to thank AAZK and my co-worker Julie Anderson for helping me distribute the survey for this research. Additionally I would like to thank the members of the Conservation Science & Community and Professional Media Workshop classes of Project Dragonfly at Miami University for their help in editing this manuscript.

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# Training Degus (*Octodon degus*) for Better Management; an account of successes and failures

Cheryl Frederick, Associate Professor of CWCE  
and Kristen Volpi, CWCE Student  
Unity College, Unity, Maine

## INTRODUCTION:

Unity College has recently started an animal program to support majors such as Captive Wildlife Care and Education, Wildlife Biology, and Sustainable Agriculture. As part of this expansion, the College created a small animal room housing a variety of species commonly used in education outreach programs. The room supports classes in which students handle, observe, or work with these animals for health, husbandry, and education program goals. A few trained students work as caretakers in the room throughout the academic year. The 2012-2013 team of students learned pretty quickly that big challenges sometimes come in small packages. The addition of degus (*Octodon degus*), a diurnal species, quickly proved to be wonderful for class behavioral

observations, but difficult for staff to manage for husbandry. Escapes were not infrequent, and minor bites occurred during routine handling attempts.

Degus are small (~300 g) rodents native to the arid shrubland of Chile (Nowak, 1991) that are a popular species in the international pet trade (WAZA.org) as well as being part of some zoo animal collections (e.g. the National Zoo and Saint Louis Zoo). Therefore, when four, eight-week-old female siblings became available we gladly accepted this donation to our program. These females lacked strong individual identification marks but had fairly distinct behavior and temperament differences which reflected their status in the dominance hierarchy. Dominance behaviors such as boxing, mounting and pinning, accompanied by agonistic vocalizations, were typically displayed at feeding time. To address this we started adding more food bowls, ultimately ending up with as many bowls as degus. Individual degus' reactions to handling or training attempts appeared to correspond to their place in the hierarchy.

The degus were maintained in a 24" x 16" x 36" split level cage (Figure 1) of one-inch-square coated wire mesh containing a running wheel, hay bedding and other varied furnishings. Enrichment items such as cardboard tubes, boxes, paper for nesting, and sticks for gnawing and chewing were provided regularly. Dust bathing opportunities were provided every other day. They were fed an *ad libitum* pelleted diet. Two to three times per week the degus were moved to an alternate enclosure so that cage cleaning could take place. Difficulties encountered during these moves prompted a training program to better manage the animals.

## TRAINING:

Moving the degus by capture and restraint to transport them to an alternate site (a clear 66 quart tub 17 ¾" x 24 ½" x 13 ¼" with lid) during cleaning resulted in a variety of problems including escapes and injury of caretakers. Bites by degus only occurred following prolonged attempts to trap and secure them by hand. Subordinate degus were the most wary, which made them more difficult to capture, and therefore also more likely to bite. Although wearing gloves lessened the chance of injury it did not alleviate the potential stress experienced by the degus or increase their cooperation.



Figure 1. Degu holding area.





When the degus first arrived (September), all moves to an alternate site were paired with a positive outcome. They were catch-handled briefly, before being given food, cover, and a dust bath. Most of them immediately began using the dust bath upon release, which suggested they were not overly distressed by the process. What we observed over time was a quicker recovery and greater apparent comfort with their new location, but continued anxious behavior by the two lowest ranking animals whenever we tried to handle them. Behaviors manifested were typical for a prey species, for example, rapid flight or crouching and hiding under cover. Whenever we shifted degus from one location to another it always required two people.

Stage one (October) of training started by considering the degus' natural history. In the wild they use an elaborate system of tunnels and communal burrows, seeking shelter in dark, narrow spaces (Nowak, 1991). Therefore, we tried a tube-shaped, cardboard, oatmeal container to attract them inside for transport. The more dominant animals readily explored the container and we used sunflower seeds to bait the more reluctant degus. When they all began to enter readily (after several sessions) we eliminated the seeds as bait. Although using this container for transporting the degus was going well, we suffered a set-back following an escape and bite during recapture. This refocused our attention on the need to get them more comfortable with handling.

Stage two (November) involved moving the degus to a new alternate cage (see Figure 2) using the tube-shaped container previously described. This new alternate cage had a removable top allowing easier access to the animals for work on handling and transfer. At first we offered sunflower seeds to all approaching animals, though the higher ranking degus sometimes kept the others back or displaced them. We next narrowed the criteria for the readily approaching, dominant degus, rewarding them

Figure 3. Degu training sequences



only after they tolerated a quick pick-up and put down. We also rewarded them for subsequent approaches. Although their behavior (approaching both before and after handling) indicated that they were progressing well, we still needed sufficient incentive for cooperation so that any individual could be handled from any location.

Stage three (January-May) started after we noticed nuts, especially almonds, were the degus favorite enrichment item. Thus the “nut incentive training program” was born; degus were given the opportunity to approach an open hand while being shown a nut. Degus that actively approached and touched the hand were given a nut. The criteria for desired responses were then narrowed to stepping out fully onto a hand, and finally to being held briefly and carried to the other cage. Approaching and stepping onto the hand were followed by brief hold and carry as an established sequence. The degus' cooperation was completely voluntarily and while this happened more readily in the alternate cage, it did occur in both. By the end of May this method worked consistently with three out of four degus; the exception was the lowest ranking degu who refused to even approach the trainers. We continued to use two trainers so that one could focus on the degu being handled while the other secured cage doors, monitored, or worked with other degus.

Stage Four (June) consisted of routinely using both handling and the tube-shaped container for transport between cages. Not all caretakers participated in handling, and the cue-to-hand-for-pick-up method always required more time and patience. We now scaled back on using nuts and replaced them with sunflower seeds that had fewer calories, could be dispensed more frequently, and eaten quickly by the degus (Figure 3). In addition, the cue “load” was added to the presentation of the container. It was unclear if the degus understood the verbal cue we paired with it, but they did clearly respond to the visual presentation of the container.

#### ADMITTING DEFEAT:

Throughout our training of the degus we tried a number of things that simply did not work. In early November while training the degus to use a tube-shaped container for transport we also tried placing a nest box in the cage. The idea was to introduce a more permanent version of a “burrow” in the hopes that we could also use it to facilitate transfer. This failed because they did not use the box with any consistency and never used it all at once. Following the “nut incentive training program” the degus became so comfortable with approaching the front of the cage, we risked escapes when doing simple husbandry such as adding food bowls. We therefore attempted training them to station, but our degus did not appear to grasp the concept of the clicker-as-a-bridge and showed no signs (e.g. orientation) of associating its noise with the presentation of a primary reinforcer. Perhaps a different choice of secondary reinforcer, such as a whistle, would have been more effective. Last but not least, we also suffered a major regression in their willingness to be handled after they were moved to a new, larger, subdivided cage (Figure 4) last July. No

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Figure 4. The larger, subdivided holding area.

mishaps were associated with this move, but still the change in housing resulted in a profound setback in trust and cooperation.

#### WHERE WE ARE TODAY:

Although the new degu cage allowed us to shift animals between two separate sections, it still required their complete removal weekly to be fully cleaned. Unfortunately, the degus would no longer step onto our hands and only the most dominant degu would consistently enter the transport container. We therefore built a chute that lined up with the cage's lower doors and once again baited it with treats, hay, and a dust bath. In what we now recognized as typical degu fashion, the higher ranking animals entered readily but the subordinate ones took a lot of time. This pattern meant a lot of running in and out by all group members and our reliance on eventually trapping them in the chute. Fortunately, their comfort with it has recently increased. Now three of them enter it readily, and we wait, but for not too long, for the fourth. We are now pursuing modifications to the chute so that it can be subdivided to lock some animals in while waiting for others, and rewarding after entry versus baiting. Finally, their recent approach behavior (intermittently reinforced with seeds) and demeanor when interacting with us indicates that we can at last start working towards handling again....at least with three of them.

We would like to thank CWCE students Patricia Preston, for her assistance with training the degus, and Brian Klotzbier, for designing and building the excellent degu chute.

#### REFERENCES:

- <http://www.waza.org/en/zoo/visit-the-zoo/rodents-and-hares/octodon-degus>
- Nowak, R. and E. Walker. 1991. Walker's mammals of the world. Baltimore: Johns Hopkins University Press.

#### Some examples of zoos with degus:

- <http://nationalzoo.si.edu/Animals/News/degus-2014.cfm>
- <http://www.stlzoo.org/animals/abouttheanimals/mammals/rodents/degu/>

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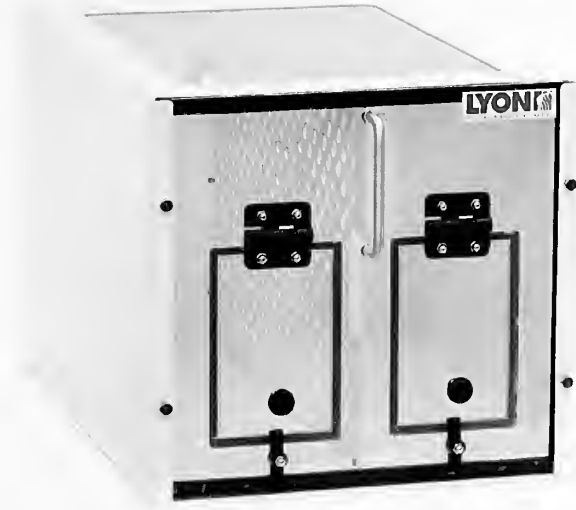
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