



CREW ReView



Lindner Center for Conservation and Research of Endangered Wildlife • Cincinnati Zoo & Botanical Garden

Fall 2007



Roth's Remarks – CREW in the News



Dr. Terri L. Roth
VP of Conservation,
Science, Living
Collections and
Director of CREW

The role of modern day zoos is always evolving, and in today's world of impoverished wildlife populations and habitats, there is more pressure and need than ever before for zoos to step up their involvement in research and conservation. The goal of every CREW scientist is to conduct research that ultimately helps save endangered species. However, progress

often is slow in science, and many researchers wait a lifetime to realize major breakthroughs. Through their hard work, dedication, intelligence and relentless perseverance, CREW scientists have achieved an admirable list of notable accomplishments over the past decade. We rejoice over each and every one of these triumphs for the beneficial impact they will have on the plants and animals about which we care so passionately, but there is another byproduct of CREW's success that greatly benefits the entire greater Cincinnati region. CREW's scientific advances often

make headlines locally, nationally and internationally. This kind of recognition for CREW's substantive work conserving wildlife is exactly what draws attention to the Queen City and keeps the Cincinnati Zoo & Botanical Garden at the top of the list as a world leader among zoos. After all, new exhibits will eventually age, plants and animals will move in and out of the collection and events become memories, the species we save will become the lasting legacy of the Cincinnati Zoo & Botanical Garden.



Rhino Signature Project Updates

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Indian Rhino "Nikki" is Making History

Nikki, the Zoo's 15 year old Indian rhinoceros is about to do what no other endangered rhino has done, give birth to a calf produced through artificial insemination. CREW scientists developed the successful AI technique, and what makes Nikki's pregnancy even more important is the fact it



Ultrasound image of Nikki's pregnancy at Day 88 of gestation

was produced using frozen-thawed Indian rhino spermatozoa. This first time expectant rhino mom is due to give birth in late December 2007. As Nikki's due date approaches, CREW researchers continue to monitor urinary progesterone concentrations and regularly conduct ultrasound exams. In early December, a 24-hour birth watch on Nikki will begin. Zoo staff and dedicated volunteers will observe Nikki around the clock on monitors set up in the CREW public exhibit. Here they will record Nikki's activity and behavior in order to detect the first signs of labor. The milestone event will mark the first ever Indian rhino birth at the Cincinnati Zoo. Most important, it represents a significant birth for the conservation of this endangered rhino species. Poaching in Nepal and Assam, India has intensified over the past several years reducing the wild Indian rhino population to less than 2,000 animals. CREW's monumental scientific achievement with the Indian rhino comes at a critical time and will help facilitate captive gene pool management for the species to ensure a population that is healthy and self-sustaining.

Sumatran Rhino Three-peat Provides Hope for the Species

On April 29, 2007, the Cincinnati Zoo's world famous Sumatran rhino, Emi, delivered a healthy, 86-pound male calf. With this birth, Emi became the first Sumatran rhino in history to produce three calves in captivity. The calf was named "Harapan" by popular vote following a nation-wide naming contest. Harapan means "hope" in Indonesian (and the abbreviated "Harry" is a perfect nickname for the hairy rhinoceros calf).

As the only facility in the world successfully breeding this species, the Cincinnati Zoo & Botanical Garden has the distinction of being the leader of the Sumatran rhino captive breeding effort. This success is the direct result of two efforts: 1) the research conducted at CREW that unraveled the mystery of Sumatran rhino reproduction and, 2) the subsequent integration of that science into the intensive animal management program carried out diligently by the animal keeper staff.

In 2001, Emi gave birth to her first calf, Andalas. This was the first time in 112 years that a Sumatran rhino successfully reproduced in captivity. In February, Andalas made a historical trek back to his ancestral homeland of Sumatra to serve as the catalyst for the captive breeding effort in the species' homeland. In 2004, Emi produced a second healthy female calf, Suci, who still resides at the Cincinnati Zoo. Emi and Harry have been on exhibit most of the summer and have been extremely popular with the visitors.



"Harry", Emi's third calf born at the Cincinnati Zoo

The “Y’s” and “Y-Not’s” of Rhino Babies



Photo of a gel of separated DNA fragments from an assay of pregnant female rhinos. Genomic DNA isolated from the serum of the rhinos was run in duplicate to detect a Y chromosome specific gene. Note the banding pattern for pregnant Sumatran rhino Emi serum and the male serum control. Emi was 72 and 88 days pregnant with Harry when the serum samples were taken. Note no bands were produced from the serum of a pregnant white rhino that subsequently gave birth to a healthy female calf..

Just as in humans, the X and Y sex chromosomes of a rhino determines gender. Two X chromosomes make a female rhino, while an X and a Y chromosome make a male rhino. CREW scientists have developed a molecular technique that allows gender determination of a rhino calf while in utero simply by analyzing the blood of the mother rhino. Using serum collected from the pregnant rhino and exquisitely sensitive detection techniques, CREW scientists are able to determine whether the fetal DNA in the mother’s serum is derived from a gene on the Y chromosome - a DNA region that is only present in males. If this DNA is detected in the mother’s serum, then she must be carrying a male calf.

If there is no male DNA present, the calf must be female. To date, this rhino baby gender test has been 100% accurate and in fact, was used to determine the gender of our own Sumatran rhino, Harry, during gestation by analyzing the serum of his mother,



“Harapan” the male Sumatran rhino calf born to Emi after a 479 day gestation.

Emi. While CREW scientists are still collecting data for this study, it appears this test will provide a powerful management tool for institutions propagating rhinos. The ability to determine gender of rhino offspring will benefit zoos and each rhino Species Survival Plan by allowing more lead time for housing requirements and subsequent breeding recommendations. Besides, how else will zoo personnel find out whether they need to paint the rhino barn pink or blue!

Emi and the Rhino Scientist Debuts

Emi and the Rhino Scientist is a new 64-page book for young people that tells the amazing story of how CREW Director, Terri Roth, helped Emi become the world’s most famous Sumatran rhino mom. The book features more than 80 full-color photographs of Emi and her family as well as CREW and Cincinnati Zoo staff at work. Although the book’s focus is Emi’s story, it also incorporates photos and valuable information about the other four rhino species. Houghton Mifflin is publishing the book as part of their award-winning Scientists in the Field series. The book was launched in Cincinnati in October and is available at many local bookstores and on Amazon.com. Check out the author’s website (www.marykaycarson.com) for more information. If you love rhinos, wonder how zoos are helping to save endangered species, know a budding scientist, or just enjoy good wildlife photography, you won’t want to miss this book!

Mary Kay Carson is a writer and author of seven books for young people, including *Exploring the Solar System* and *The Wright Brothers for Dummies*. She attended a year of high school at the Cincinnati Zoo Academy and studied biology in college. You can learn more about her books and her website on her website at www.marykaycarson.com.

Tim Uhlman has been a freelance photographer for almost seven years. He photographs lots of news and sports events for newspapers and magazines, and does wildlife photography most of all. You can see more of his photos at www.tomphoto.com.

Mary Kay and Tim first wrote about and photographed Emi for a magazine article about breeding captive rhinos after Amalia was born in 2003. How the pair earned and lost a century-old house surrounded by deer, hawks, woodchucks, songbirds, and other creatures in Cincinnati, Ohio.

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Mary Kay Carson
With photographs by Tim Uhlman

EMI AND THE RHINO SCIENTIST

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Small Cat Signature Project Updates

Exploring the Reproductive Seasonality of a Wild Felid

Few studies have ever attempted to evaluate the reproductive biology of cats in the wild, primarily because they are so difficult to observe unobtrusively or easily capture for biological sampling. In our ongoing study in Mongolia, CREW is working in collaboration with the Mongolian Academy of Sciences, Wildlife Conservation Society, Michigan State University and Bristol University to conduct the first seasonal assessment of reproductive traits in a wild, free-living felid species. For this project, 16 Pallas' cats, including 7 males, have been radiocollared for ecological monitoring, allowing us to recapture individuals every four months for semen collection, evaluation and freezing. In February 2007, CREW's Director of Animal Research, Dr. Bill Swanson, returned to Mongolia to conduct reproductive assessments of male Pallas' cats during the winter breeding season. Dr. Swanson, assisted by a Mongolian PhD student, Bariushaa Oyuntuya (Oyuna), collected semen from six wild Pallas' cats and froze 85 semen straws for importation to the U.S. In April, Oyuna traveled to Cincinnati and spent two weeks at CREW receiving intensive training in reproductive sciences for her PhD studies. In June, Oyuna completed the next phase of the project by conducting reproductive evaluations on five wild Pallas' cats in the post-breeding season and, in October, will finish up the study by evaluating additional males during the pre-breeding season. These research findings will form the basis for Oyuna's PhD thesis and provide us with a much better understanding of the reproductive biology of this threatened species in the wild.



Dr. Swanson and graduate student Oyuna collecting semen from an anesthetized wild Pallas' cat in Mongolia

As the Worm Turns: Preventing Toxoplasma Infection in Pallas' Cats

Pallas' cats in the wilds of Central Asia are rarely exposed to the domestic cat parasite *Toxoplasma* but, in zoos, they can become infected through ingesting wild birds and rodents that enter their outdoor exhibits. The consequences during pregnancy frequently are deadly since the mothers may pass the parasite to their kittens during gestation or in their milk during nursing. Because the kittens' immune systems are immature, they cannot fight off the parasite and usually succumb. CREW scientists, working with the Cat House and Nursery keepers and the Zoo's vet staff, have been exploring different treatment strategies for keeping the kittens parasite-free. This year, our *Toxoplasma*-infected Pallas' cat female (Marina) was treated throughout her 68 day pregnancy with two anti-parasitic drugs - diclazuril and clindamycin - hidden in her food. On the day of birth, her five kittens were fostered to a domestic cat (named Mouse) at CREW that had given birth a few days earlier to her own kittens. The Pallas' cat kittens were treated for the first five days after birth with injectible clindamycin while Mouse cared for the kittens as her own. After weaning, the seven-week old kittens and Mouse were moved from CREW to the Zoo's Nursery where they remained on exhibit throughout the summer months. Mouse and her domestic cat kittens were later adopted out as family pets to Zoo staff members while the five healthy Pallas' cat kittens were transferred to the Cat House to provide valuable genetic diversity to the captive population. Their survival is a testimony to the Zoo's commitment to conserving this threatened species and hopefully giving other zoos an effective option for preventing infection of their Pallas' cat kittens with this deadly parasite.



Pallas' cat kittens at six weeks of age with their surrogate domestic cat mother, Mouse

Bringing the Mountain to Mohammed.....

The Brazilian Ocelot Consortium (BOC) was established in 2002 as a precedent-setting conservation partnership involving ten U.S. zoos, including the Cincinnati Zoo & Botanical Garden, and a Brazilian conservation organization, the Associação Mata Ciliar (AMC). As one component of the BOC, each participating zoo was to receive a pair of Brazilian ocelot founders to help establish a breeding population of this endangered felid in the U.S. As an alternative to importing living ocelots thousands of miles, CREW proposed to import frozen ocelot embryos from Brazil for subsequent transfer into female ocelots in U.S.

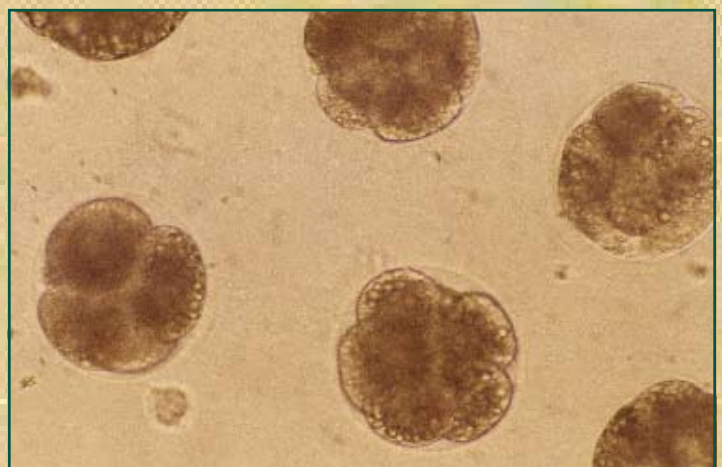


Drs. Swanson and Conforti transfer frozen-thawed ocelot embryos into a recipient female at the Associação Mata Ciliar

zoos. For this project, 76 ocelot embryos were produced using in vitro fertilization with gametes collected from 13 Brazilian ocelot founders and subsequently frozen. An importation permit for 33 frozen embryos was issued by the U.S. Fish and Wildlife Service in 2003 but an export permit could not be obtained from the Brazilian government. So, after years of waiting, we decided to bring the mountain to Mohammed. In September 2007, Dr. Bill Swanson and CREW's Brazilian post-doc Dr. Valeria Conforti, traveled to Brazil with the intention of transferring these frozen embryos into Brazilian ocelot recipients maintained at AMC. Over a four week period, Drs. Swanson and Conforti conducted laparoscopic transfer of 24 frozen-thawed embryos into the oviducts of 8 synchronized recipients. Pregnancy results are still pending. The production of viable ocelot offspring in Brazil via transfer of frozen embryos will further establish the value of these reproductive technologies for felid conservation and hopefully help us to convince the Brazilian government to "let my embryos go" (in keeping with the religious symbolism) for future importation requests.

Organ Donation Saves Lives – Enroll your Cat Today

By having your pet cat spayed, you undoubtedly are helping to keep the burgeoning domestic cat population under control but you just might be helping CREW to save endangered wild cats as well. Some of our research involves developing and refining reproductive technologies in domestic cats for application to wild cats, but it is difficult to get enough domestic cat oocytes (eggs) for all of our studies. One excellent alternative is to collect ovaries from local veterinary clinics after they spay female cats. It is not unusual to obtain 10-12 pairs of ovaries on a single day from these clinics, resulting in well over 100 oocytes for our research! Recently, the majority of these oocytes have been used in a unique fertility test. It is very difficult to tell a 'good' sperm sample from a 'bad' one by appearance alone. Fortunately, it seems that sperm from every cat species are capable of fertilizing domestic cat oocytes, allowing us to test sperm samples in vitro without using valuable oocytes from nondomestic cats. This approach has allowed us to optimize methods for sperm cryopreservation in black-footed cats, sand cats and ocelots and verify the fertility of our male clouded leopard. If you have a female cat that needs to be spayed, please consider contacting the clinics that have been assisting CREW. Call the NOMAD mobile clinic (local scheduling with Lotus, 513-721-6772) or the UCAN Spay and Neuter Clinic (513-721-7387; www.ucanclinic.org). Your cat, by donating its ovaries, could help us to conserve its wild cousins – and you can 'wow' your neighbors with the story at that next block party!



Embryos produced using domestic cat oocytes donated by a local spay clinic and frozen-thawed sperm from the Zoo's black-footed cat.

SAVING SPECIES

WORKING GLOBAL AND LOCALLY



Autumn Buttercup



Manatee



Four-Petal Pawpaw



Brazilian Ocelot



Saharan Antelope

Central/South America

- Blue and Gold Macaw
- Brazilian Ocelot
- Giant Otter
- Andean Condor
- Scarlet Macaw
- Chilean Penguins



Chilean Penguins



Black Rhinoceros

North America

- Alaskan Seabirds
- Autumn Buttercup
- Northern Wild Monkshood
- Mill Creek Restoration
- River Otter
- Cumberland Sandwort
- Masked Bobwhite Quail
- Local Flora
- Manatee
- Florida Rare Plants



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Sand Cat



African Violet

Asia

- Sand Cat
- Red Crowned Crane
- Pallas' Cat
- Indian Rhino
- Japanese Giant Salamanders
- Fishing Cat
- Sumatran Rhino
- Rhinoceros Hornbill
- Elephant
- Asian Small Clawed Otter



Pallas' Cat



Sumatran Rhino



Indian Rhino



Rhinoceros Hornbill

Africa

- Sahelo-Saharan Antelopes
- Nigerian Guenons and Mangabeys
- Lowland Gorilla
- Bushmeat Crisis Taskforce
- Okapi
- African Violet
- Cheetah
- Black-Footed Cat
- Spotted-necked Otter
- Black Rhinoceros
- White Rhinoceros



Black-Footed Cat



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 Delta's generous support helps expand CREW's conservation and research efforts nationally and internationally. With Delta's assistance, CREW is Saving Species with Science® around the globe.

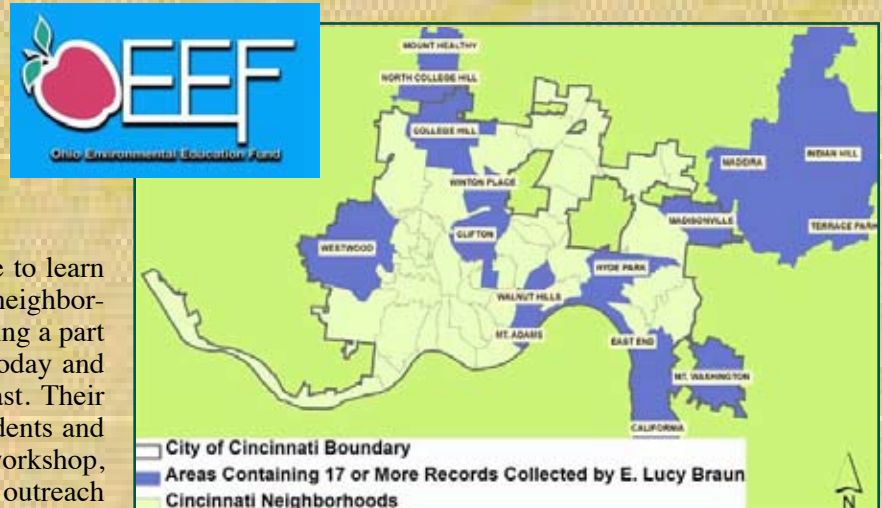
Plant Signature Project Updates

Flora Finder: Grant Will Help Teachers and Students Look at Local Flora

CREW's Plant Division has received a grant from the Ohio Environmental Education Fund to develop the Flora Finder project. Flora Finder is a part of the Local Flora Project that will help teachers and students use the Local Flora Database to learn about plants in their area and how their flora may have changed over the past century. The grant will fund a teacher workshop during the winter of 2008 for a pilot group of teachers to learn about the database and about developing plant survey projects with their students. The pilot projects will be done in the spring of 2008.

Students and teachers will use the database to learn about what is known about the flora of their neighborhood or region. They will then work on exploring a part of that area to discover what plants are there today and to compare their findings with those of the past. Their data will then be added to the database for students and researchers in the future. In addition to the workshop, the grant will fund the development of a new outreach program and Jr. Plant Scientist kits centered on the Local Flora Project.

At the same time, the Local Flora Database continues to grow, with the addition of information from the Herbarium at Northern Kentucky University and from plant surveys from the area. It will be several years before data entry of current information is completed, and additional information will continue to be entered as it becomes available. But, thanks to the OEEF and their support of Flora Finder, students and teachers will begin to benefit from the database within this school year and lay the groundwork for the use of the database in the future.



Good News from Utah!

In June of this year, 130 Autumn buttercup (*Ranunculus aestivalis*) plants, produced through tissue culture at CREW, were planted at the Sevier Valley Preserve, land that was acquired by the Nature Conservancy specifically for the protection of this species. Although there were 200 plants a few years ago, the last census listed 30 plants, and this year even fewer of the original plants were found. This species is definitely in a precarious situation.

The exact reason for the decline isn't precisely known, but changes in the hydrology of the wet meadow in which it grows may be involved. The plants from CREW were planted in two areas—first in the same area as the original population, and second, in a slightly wetter area, 200 meters away. The plants were watered weekly for the first month, and then they were on their own for the rest of the summer.

In a recent visit to the site, Dr. Renee Van Buren from Utah Valley State College found that over 92% of the plants had survived thus far, and 78% were in good condition. Better survival was observed in the new, wetter site, suggesting that hydrology may indeed be affecting the survival of this plant.

This project is a wonderful example of how collaboration can work for conservation. The plants propagated at CREW (using methods developed several years ago with funding from the Institute of Museum and Library Services) were acclimated at the Arboretum at Flagstaff and planted by staff, students and volunteers from Utah Valley State College and The Nature Conservancy. Funding for the project was provided by a grant from the U.S. Fish & Wildlife Service, and more plants are being prepared at CREW for planting next year. With the information from this planting and the success achieved thus far, the future looks brighter for this beautiful buttercup.

Photo: Renee Van Buren



CREW ReView

Saving the “Pennies”

An old adage says, “Save the pennies and the dollars will take care of themselves.” While we still need to remember the big picture when we work for conservation, working to save individual species definitely adds up to a healthier environment. One of those environmental “pennies” is the Todsens pennyroyal, or *Hedeoma todsenii*, a member of the mint family that is endemic to two mountain ranges in central New Mexico. This small plant is found in three clusters of populations, two in the Sacramento Mountains and one about 40 miles west in the San Andres Mountains of the White Sands Missile Range. This species produces little or no seed and appears to reproduce primarily through vegetative growth. Because seeds are not available for propagation or storage, CREW Plant Division researchers have developed tissue culture propagation methods for this species. Techniques for cryopreserving tissues from the plant have also been developed, and these tissues are being stored in liquid nitrogen, in CREW’s Frozen Garden.

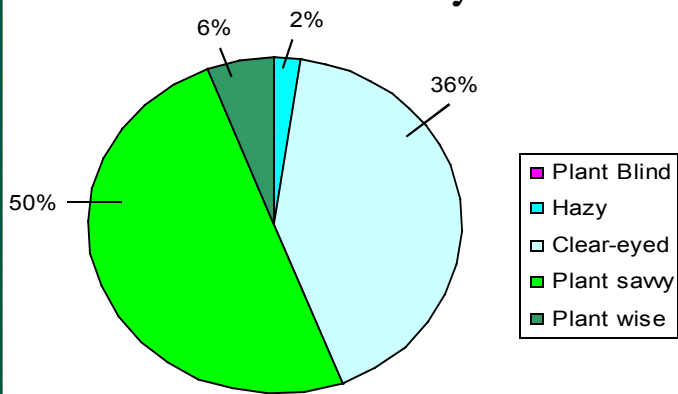


Photo: David Anderson

Because the plant reproduces vegetatively, it was also important to determine how much genetic diversity is available in this species. To do this, the DNA was carefully extracted from each tissue line and analyzed on the molecular level using a method known as Random Amplified Polymorphic DNA analysis (RAPD). If the plants being tested are genetically different, this technique will reveal differences in the structure of their DNA. In the case of Todsens pennyroyal, some differences were found between samples, and using computer analysis, the samples were grouped according to the degree of similarities and differences in the DNA. Not surprisingly, samples from the same populations were more closely related genetically than those from neighboring populations.

All of the populations tested thus far have been from one cluster of populations in the Sacramento Mountains. Collaborators at White Sands Missile Range have recently collected samples from the populations there, and these will be propagated and tested using RAPD analyses to see what genetic differences there are in this more distant population. Those who might utilize samples of these plants for research or reintroduction will then know which of the “pennies” are the most valuable genetically and can work more effectively to protect this species for the future.

Plant Blindness Survey Results



According to a recent survey given to employees, interns and zoo academy students at CZBG, no one suffers from “Plant Blindness”. The term, introduced in 1998 by Elisabeth Schussler Miami University Professor and James Wandersee of Louisiana State University, is broadly defined as “the inability to see or notice plants in one’s own environment, leading to the inability to recognize the importance of plants in the biosphere and in human affairs”. If visitors to CZBG do not pay attention to plants and their role in maintaining life, why would they support plant conservation, plant science research and education? With over 3,000 species of plants in its botanical collection, the Discovery Forest in its education center and the Plant Research Division at

CREW, CZBG is uniquely positioned to play a pivotal role in helping the community to notice and appreciate the plants in our world.

We can spread the message that plants are as important as animals by offering the public visually appealing information and programs, by engaging families in hands on activities and exposing teachers and students to the excitement of scientific inquiry on plants. Wandersee adds that “without informal and formal horticultural and botanical education - such as mentors and botanical gardens provide - one is not likely to care about plants or to realize that all life depends on plants”. Together all of us at CZBG can join in encouraging others to open their eyes to the wealth of plant life around them and not suffer from plant blindness.



Do you notice the plants in this picture?

CREW Scientific Highlights

PEER-REVIEWED PUBLICATIONS

Herrick JR, JB Bond, GM Magarey, HL Bateman, RL Krisher, SA Dunford and WF Swanson. 2007. Development of a feline optimized culture medium: effects of ions, carbohydrates, essential amino acids, vitamins and serum on the development and metabolism of IVF-derived feline embryos relative to embryos grown in vivo. *Biology of Reproduction* 76:858-870.

Newell AE, S Kennedy-Stoskopf, JL Brown, J Levine and **WF Swanson.** 2007. Seminal and endocrine characteristics of male Pallas' cats (*Otocolobus manul*) maintained under artificial lighting with simulated natural photoperiods. *Zoo Biology* 26:187-199.

Stoops MA, JB Bond, HL Bateman, MK Campbell, GP Levens, T Bowsher, S Ferrell and WF Swanson. 2007. Comparison of different sperm cryopreservation procedures on post-thaw quality and heterologous in vitro fertilization success in the ocelot (*Leopardus pardalis*). *Reproduction, Fertility and Development* 19:685-694.

BOOK CHAPTERS

Swanson WF, MA Stoops, GM Magarey and JR Herrick. 2007. Sperm cryopreservation in endangered felids: developing linkage of in situ – ex situ populations. In:

Roldan E and M Gomenido (eds.). *Spermatology*. Nottingham, UK: Nottingham University Press; Pp. 417-432.

SCIENTIFIC PRESENTATIONS

Charls SM and VC Pence. 2007. Using tissue culture to recover the endangered Northern wild monkshood (*Aconitum noveboracense*) in Ohio. Poster presentation at the 34th Natural Areas Association conference, Cleveland, OH.

Harris LA, BG Steinetz, JB Bond, S Lasano and WF Swanson. 2007. Refinement of a commercial bench-top relaxin assay for pregnancy diagnosis using urine from domestic and non-domestic felids. Proceedings of the Annual Meeting of the American Association of Zoo Veterinarians, pp 232-233. Oral presentation, Knoxville TN.

Herrick JR, M Campbell, K Benson, R Coke and WF Swanson. 2007. In vitro function of black-footed cat (*Felis nigripes*) spermatozoa following cryopreservation. Proceedings of the Annual Meeting of the Society for the Study of Reproduction. *Biology of Reproduction (Special Issue)*:131 (abstract 228). Poster presentation, Omaha NE.

Pence VC, Charls SM, Plair BL, Lindsey K, and GD Winget. 2007. Propagation and cryopreservation of Todsens' pennyroyal

(*Hedeoma todsenii*) in vitro. *In Vitro Cellular and Developmental Biology* 43: S31A. Contributed oral presentation at the 2007 In Vitro Biology Meeting, Indianapolis, IN.

Plair B, K Kuchinski, K Pilgrim, S Warren, D Boodoo, S Ramsabage, A Ramadhar, T Kemraj and L Lal. 2007. Behavioral monitoring of Blue-and-yellow macaws (*Ara araurana*) reintroduced to the Nariva Swamp, Trinidad. Proceedings of the VIII Neotropical Ornithological Congress, (abstract S01-1) p.43. Oral presentation, Maturin Venezuela.

Plair B, D Boodoo, C de Chant, S Ramsabage, A Ramadhar, M Lal, B Rampaul, S Warren and N Mohammed. 2007. Community involvement in the reintroduction of Blue-and-yellow macaws (*Ara araurana*) to Nariva Swamp, Trinidad. Proceedings of the VIII Neotropical Ornithological Congress, (abstract #017-2) p. 48. Oral presentation, Maturin Venezuela.

Swanson WF, JR Herrick, M Campbell, HL Bateman, JB Bond, GM Magarey, BP Fitzgerald, RF Nachreiner, CE Farin and S Kennedy-Stoskopf. 2007. Pallas' cats (*Otocolobus manul*) coming and going: puberty and reproductive senescence in a seasonally-breeding felid. Proceedings of the Annual Meeting of the American Association of Zoo Veterinarians, pp 178-179. Oral presentation, Knoxville TN.

CREW Wish List

Microplate Washer

In order to analyze hormone concentrations to time breedings and detect pregnancies in species ranging from toads to rhinos a new microplate washer is needed. Cost - **\$5,000.**

Indian Rhino Surveillance System

To monitor our special Indian rhino, Nikki, who is slated to give birth over the holidays to a calf conceived through artificial insemination, a surveillance system is needed. We've received partial funding, but additional monies are required. Total Cost – **\$9,000**

Plant Books

To stay up to date with cutting edge plant technology any of the 11 volumes of *Recent Advances in Plant Tissue Culture*, are desired. Cost: **\$60 - \$110 each.**

Portable Embryo Freezer

Our ability to transfer frozen embryos into female ocelots in Brazil obviously depends on having frozen embryos in the first place. Portable embryo freezers don't come cheap but they are essential for our research and we really, really need a new one. Cost: **\$6000.**

Field Microscope and Electroejaculator

Oyuna, our Mongolian PhD student, has monopolized the use of our field microscope and electroejaculator while chasing Pallas' cats across the steppes of Mongolia. Now, Valeria, our new CREW Post-Doc, needs the same portable equipment to start up her project studying wild ocelots in Brazil. Let's try to keep Valeria happy. Cost: **\$1300.**

Ultrasound Text Books

Ultrasonography has been an incredibly valuable tool in our groundbreaking cat and rhino research programs, and has also been used to diagnose pregnancy in a number of species in our Zoo. To keep up to date on the latest in ultrasonography, new text books are needed. Cost for books: **\$96.00 and \$75.00.**



CREW ReView

CREW Celebrates A Decade of Training Post-doctoral Fellows -by Dr. Terri Roth

When I first arrived at the Cincinnati Zoo & Botanical Garden as the new CREW Director, one of my goals was to develop a post-doctoral training program similar to the one I had entered into at the National Zoo in Washington D.C. after completing my Ph.D. Very few post-doctoral training programs exist in Zoos, and they provide a unique and valuable opportunity for those hoping to apply their experience and training in science to help save endangered species. With the support of then Director Ed Maruska, I hired CREW's first post-doc in 1997. Since that time, CREW has served as the training ground for eight post-doctoral fellows and recently welcomed its ninth. The program has clearly been a win-win for all involved. CREW and the Cincinnati Zoo & Botanical Garden have benefited significantly from the enthusiasm, new ideas and technology these recent Ph.D. graduates bring to CREW. Their hard work and productivity lead to many achievements that enhance the Zoo's reputation worldwide, advance the science of saving species and benefit the animals. The ultimate goal of the program is to prepare these scientists with the skills and knowledge they need to establish their own successful wildlife research programs in zoos or universities around the world. Post-doctoral positions at CREW are typically one to three years and have been made possible largely through the very generous donations from Rowe and Beth Hoffman. The Hoffman's annual commitment to this program since its inception, has allowed the program to continue uninterrupted for a decade. Looking back at what each and every post-doc achieved and what they are doing now, I think the Hoffmans will agree that their investment has proven fruitful in providing invaluable support to those helping to save wildlife.



Justine O'Brien

From: University of Sydney, Australia

Time at CREW: 5/97 – 12/98

Notable Achievement: Successful collection and cryopreservation of penguin sperm.

Current position: Works full time as a reproductive physiologist for Sea World; lives in Australia.



Amy Obringer

From: Wright State University, OH

Time at CREW: 4/98 – 12/99

Notable Achievement: Started CREW's amphibian research program and characterized the response of toads to exogenous hormone injections.

Current Position: Faculty at St. Francis University, IL; continues with her toad research engaging undergraduates in the work.



Andy Kouba

From: University of Gainesville, FL

Time at CREW: 10/99 – 10/01

Achievements: Expanded amphibian program and made significant strides in toad sperm longevity studies.

Current Position: Memphis Zoo Curator of Conservation



Dr. Carrie Vance

From: Johns Hopkins University

Time at CREW: 3/00 – 3/02

Notable Achievement: Evaluated immune cell function in all four captured rhino species.

Current Position: Visiting professor at University of Memphis



Monica Stoops

From: University of California, Davis, CA

Time at CREW: 12/01 – promoted 1/04

Notable Achievement: Developed the methodology for artificial insemination in the Indian rhino and produced the first pregnancy in a rhino by AI with frozen-thawed sperm.

Current Position: CREW Reproductive Physiologist; Spearheads the Indian rhino program.



Megan Jaskowiak

From: North Dakota State University

Time at CREW: 1/04 – 9/06

Notable Achievement: Improved rooting success in *Asimina tetramera* and other challenging species using an auxin pulsing procedure.

Current Position: Teacher in Clermont County, OH



Jason Herrick

From: Purdue University

Time at CREW: 1/04 – 10/07

Notable Achievement: Developed an optimized culture medium for cat embryos and initiated a field research project with black-footed cats in South Africa

Current Position: Faculty position at University of Illinois; continuing his work with domestic and exotic cats



Genevieve Magarey

From: Macquarie University, Australia

Time at CREW: 1/04 – 12/06

Notable Achievement: Identified an improved hormonal regimen for successful embryo transfer in domestic cats and cryopreserved hundreds of IVF embryos and sperm pellets from 22 cat models of hereditary disease

Current Position: Currently applying for a faculty position at the University of Sydney



Valeria Conforti

From: University of Washington (from Brazil)

Time at CREW: Started June, 2007

Achievements: Recently completed eight ocelot embryo transfers in Brazil.

Current Position: CREW Post-doctoral Fellow

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