

# THE GOMPOU

A NEWSLETTER OF THE KORI BUSTARD  
SPECIES SURVIVAL PLAN



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Welcome to the fourth edition of the Gompou- a newsletter of the kori bustard SSP! Gompou is the Afrikaans name for kori bustard and translates to gum-eating bird- a reference to the bird's habit of eating gum from acacia trees.

## SSP HAPPENINGS

Five chicks successfully hatched this past year: a male and a female at the Dallas Zoo and two males and a female at the National Zoo.

The two males at the National Zoo, who were hatched to an over-represented pair, will be going to Duisburg Zoo in Germany this coming spring. The kori bustard population in Germany has been declining for several years. The introduction of these two birds into the German population will help increase their numbers as well as genetic viability with the hope that Germany may eventually be able to help the U.S. population by sending birds here.

The SSP is interested in trying to send more kori bustards to Germany. Institutions that have over-represented birds that they would like to breed for this possibility should contact Sara Hallager at [hallagers@si.edu](mailto:hallagers@si.edu).

## DID YOU KNOW?

- There are many threats to the survival of kori bustards in the wild: habitat destruction, poisoning of insects that koris eat, hunting, and collision with overhead power lines.
- Kori bustards love to dust bathe. Dust bathing substrates that have been successfully used in captivity include coarse oyster shell, sand and mulch.
- Kori bustards will readily eat just about anything including nails, batteries, broken glass and coins. Keepers should check enclosures daily for these items as koris have died after consuming them.

## FEATHER DISTRIBUTION TO FLY TIERS

The Birmingham Zoo has a lovely display and graphic (see below) recently installed devoted to the efforts of the SSP with its feather distribution program for fly tiers. It has generated a lot of interest from people who have viewed it.

This feather distribution program collects molted feathers from captive kori bustards and distributes them for free to fly tiers who request them. It is an effort to reduce the demand for black market kori bustard parts and feathers.

Continued collection of molted kori bustard feathers for the fly tiers program resulted in a \$1,000 donation to the SSP from a grateful fly tier. Want more information about the program or how to participate? Contact Jocelyn at the email address at the top of the newsletter or Sara at the email address above.



## FUNDRAISING EFFORTS



Special thanks are in order for Cheyenne Mountain Zoo! Their efforts resulted in \$250 being raised for the SSP through the sale of beaded bustards (pictured left.) Interested in purchasing one for yourself? Contact Sara Hallager at [hallagers@si.edu](mailto:hallagers@si.edu)

## ONGOING RESEARCH ON WILD KORI BUSTARDS

In May of 2006, Sara Hallager, Kori bustard SSP Coordinator, was able to travel to Africa to participate in ongoing studies of kori bustards in the wild. Below is an excerpt of an Animal Keeper's Forum submission that will be printed in the next few months detailing her adventures and information about the study.

### **A Preliminary Study of the Health Status of Kori Bustards (*Ardeotis kori*) in Kenya**

#### **Sara Hallager, Biologist, Kori bustard SSP Coordinator**

The kori bustard SSP lists support of *in situ* work as a priority in its Action Plan. Through a Geraldine Meyer Travel grant from AAZK (and other funding sources), a preliminary investigation into the health status of kori bustards in Kenya was initiated in May 2006.

#### **Background of Research Study**

Although ecological studies of wild populations of kori bustards have been conducted, such studies have lacked a medical component. Understanding the medical, nutritional and reproductive components to wild populations will become increasingly necessary as the species continues to decline in Africa. Additionally, medical information including normal biological values of free ranging kori bustards are necessary in order to provide information crucial to assess and manage health, reproduction, and disease issues within the captive population. In captivity, kori bustards are susceptible to a range of bacterial, fungal, metabolic and parasitic diseases. Since disease conditions have been shown to affect the reproductive performance and survival of wild animals, understanding the medical component as well as the reproductive biology of kori bustard populations will become increasingly important as populations continue to decline.

Through this project, our aim was to create a strong and effective linkage between wild and captive kori bustard populations through which information gained from the wild population would directly affect the management and continued survival of the captive population. Additionally, the generation of baseline health parameters and hormone levels for wild birds will provide conservationists with a greater understanding of this declining species and will be a requirement in any future efforts to protect the species.

## **Research Study**

In May of 2006, I traveled to Kenya to participate in a preliminary investigation into the health status of kori bustards in the wild and to evaluate if future *in situ* studies would be possible. My colleague (and Principal Investigator), Dr. Suzan Murray, Head Veterinarian of the National Zoo and I collaborated with Dr. Muchane Muchai, Senior Research Scientist in the Department of Ornithology, National Museum of Kenya and Tim Osborne, a retired wildlife biologist who studied kori bustards extensively in Namibia for seven years. We were joined in the field by a guide from our research camp.

Our research was based at Mpala Research Centre. Mpala is located near the town of Nanyuki at the foot of Mt. Kenya. Founded in 1994, Mpala hosts researchers from around the world. Fully equipped laboratories, gracious accommodations and access to a variety of animals make Mpala an excellent location to conduct wildlife research on African animals. The Mpala Conservancy is a 194 km<sup>2</sup> property encompassing Mpala Research Centre and Mpala Ranch in Laikipia, Kenya. A wildlife-friendly working ranch, the Conservancy is home to more than 75 mammal species and 280 bird species. Laikipia is characterized by semi-arid savanna habitat that is representative of many areas of Africa. Humans, livestock, agriculture and wildlife use its resources with escalating conflict. Mpala Research Centre was established as a non-profit scientific and training facility with a directive to address environmental issues affecting the landscape and to seek ways of resolving their conflicts.

Of the many species of birds on Mpala, four species of bustard occur regularly including buff-crested bustard (*Eupodotis ruficrista*) white-bellied bustard (*Eupodotis senegalensis*), black-bellied bustard (*Eupodotis melanogaster*) and kori bustard. In Kenya, kori bustards are most numerous in the dry grassland areas of northern and western Kenya and the Rift Valley highlands south to Mara Game Reserve, Loita Plains, Nairobi National Park and Amboseli National Park. Total population size is unknown in Kenya. Kori bustards are listed by Mpala as common and abundant residents. We estimated there were 125-150 birds occurring on the property.

Our goal at Mpala was to capture between 10-20 adult (or sub-adult) kori bustards and obtain a variety of health related data including:

- To determine the prevalence of selected infectious diseases in wild kori bustards by analyzing sera for antibodies.
- To determine the protozoal and helminth parasite load of wild kori bustards.
- To determine the normal cloacal, oropharyngeal and respiratory tract microflora (aerobic bacteria and fungi) of wild kori bustards.
- To determine baseline reference ranges for hematology, biochemistry, and iron panels in wild kori bustards.
- To determine normal serum levels of vitamins, amino acids and trace elements in kori bustards that are of significance to the nutritional management of captive birds.
- To initiate baseline information on the reproductive biology of wild birds.

Additional blood was collected for an ongoing DNA study examining the relatedness of the eastern and southern populations. We collected morphometric measurements on all birds we captured and placed a ring on each bird.

## **Method of capture and data collection**

Upon sighting a bird, we assessed the habitat the bird was in as well as the disposition of the bird. Birds that appeared overly anxious were left alone as were birds that were present in vegetation too dense to string the capture net. We ensured that the area was safe for us to work in. On several occasions, elephants were in the area making capture of a kori too risky. We also assessed if the area was safe for the kori once we released it. Because the bird was stressed from the procedure of capture, if predators (e.g. jackal, cheetah or martial eagle) were in the vicinity, we opted not to capture the bird. We only attempted capture of birds that appeared calm and uninterested in our presence and which were located in habitat that was amenable to easy capture and which was safe for both humans and kori bustards.

Our capture net was a 100 m monofilament fishing net dyed a golden brown which was strung between 3-4 small bushes. If placed at the correct angle to the sun, the net became virtually invisible. While one person strung the net, a second person drove the vehicle. The rest of the team kept an eye on the kori as it was easy to lose sight of a bird as it moved about. It was critical that the vehicle remained between the person stringing the net and the bird. Kori bustards do not seem to mind vehicles in their vicinity, but as soon as they spot a human, they quickly leave the area.

Once the net was strung, the person hanging the net returned to the vehicle and we began to circle widely around and behind the bird. It was important to keep a wide distance from the bird so as not to agitate it. Gradually, the Landrover guided the kori towards the net. When the bird was about 10 m from the net, the vehicle accelerated causing the bird to run into the net. Once entangled in the net, time was crucial. The bird had to be quickly extricated so that it would not injure itself. Once freed of the net, the bird was immediately wrapped in a piece of shade cloth and weighed. The eyes were covered with two cupped hands to lessen the stress to the bird. Blood was taken followed by morphometric data (measurements of head, culmen, tarsus, tibiotarsus, tail, wing chord and arc and molt status). A numbered ring was placed above the foot. The team remained as quiet as possible during the entire process to minimize stress. Within ten minutes of capture, the bird was released upon which it either flew away or walked away from us, barking the entire time indicating its displeasure with the whole experience. A GPS reading of the capture location was taken.



Once the bird was out sight, the net was removed from the thorny acacia bushes, the gear packed up, and a search begun for another bird. One of the highlights we witnessed was a martial eagle dive bombing a male kori bustard. Martial eagles are natural predators of kori bustards, but this was a large male kori and it did not seem like the eagle could do much harm. After 10 minutes of harassment from the eagle, the kori flew off.

On some days, we captured as many as four kori bustards. On other days, the birds freed themselves from the net before we were able to get to them and we did not catch any birds. Of 18 kori bustards we attempted to capture, we were successful in catching 12 birds. At the end of each day of successful capture, all samples were inspected to ensure proper identification, the daily log was updated and blood was processed at the lab and frozen for export back to the United States.

### **Conclusion**

We considered this preliminary project a success on many levels. We verified that kori bustards were indeed common residents of Mpala and we were able to capture birds. We obtained the number of samples we initially sought and we successfully processed and transported them back to the US. We are currently waiting processing of our samples upon which we will disseminate the findings to the scientific community. We became knowledgeable about the process of working with the Kenyan government and the logistics associated with travel within Kenya. We hope to be able to return to Kenya to continue our studies of kori bustards in the wild and contribute towards preserving this remarkable bird.

### **Acknowledgements**

This study was made possible through support from the Smithsonian's Women's Committee, the Smithsonian National Zoological Park and an AAZK Geraldine Meyer Travel grant.

## **THE KORI SSP NEEDS YOU!**

In order to support the goals of the kori bustard SSP, we need to increase our fundraising efforts. Please consider selling items currently offered by the SSP, including T-shirts, pins, mugs and prints. Christmas is coming! Who wouldn't want something with a kori bustard on it? Can't think of something to give someone who has everything? How about donating to the SSP in someone's name? You can feel confident that the money will go directly towards helping the goals of the kori bustard SSP. For more information, contact Sara Hallager at 202-633-3088 or by email at [hallagers@si.edu](mailto:hallagers@si.edu).



## **THREAT TO KORI BUSTARDS IN BOTSWANA**

BirdLife Botswana has undertaken an investigation of Kori Bustard *Ardeotis kori* poaching and found the practice to be widespread, both for local consumption and for export to South Africa and beyond.

The Kori Bustard is the world's largest bustard and occurs across sub-Saharan Africa. Although still common in some protected areas, it is currently experiencing rapid population declines across much of its range. Botswana is a stronghold for the species, but it is threatened by habitat loss due to overgrazing and poaching.



The study focused on 16 settlements bordering the Kgalagadi Transfrontier Park (KTP) and Khutse Game Reserve (KGR)—both strongholds for Kori Bustard in Botswana.

"We found that many Kori Bustards are poached for local consumption, mainly by men over 30," says BirdLife Botswana's Kabelo Senyatso. "Snares are mostly used to kill birds in KGR, whilst guns are favoured in KTP. In some areas only tribal elders are allowed to eat bustard meat. Sometimes a traditional doctor is brought in to 'treat' it before it is eaten, because of a belief that bustard meat can otherwise cause mental illness."

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**"We also found evidence of illegal cross-border trafficking in live bustards. Up to 10 at a time are smuggled into South Africa where they are sold as a delicacy to wealthy individuals or exported outside Africa." —Kabelo Senyatso, BirdLife Botswana**

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However, on a positive note, the study found no evidence of trade in Kori Bustard body parts was found within Botswana, unlike other range states.

The study was funded by the Disney Wildlife Conservation Fund and the Global Environment Facility/Small Grants Programme (Botswana office).  
<http://www.birdlife.org/news/news/2005/11/kori.html>

### **ETHOTRAK PROJECT TO START IN FIVE ZOOS (by Sara Hallager)**

Recently there has been an increase in the propagation of bustard species in captivity. A breeding program for the kori bustard (*Ardeotis kori*) in the United States is managed under the auspices of the Association of Zoos and Aquariums as a Species Survival Plan (SSP) species. The United States SSP captive breeding program for kori bustards aims to maintain populations that are genetically and demographically self-sustaining without relying on continued imports from the wild. In captivity, breeding is currently limited to a few prolific individuals and a greater understanding of the behavioral repertoire of reproductive and non-reproductive individuals is urgently needed. The precise descriptions of kori bustard behaviors can provide a standard that can be used for systematic and quantitative study of kori bustard behavior, both in the wild and in captivity. A greater understanding of kori bustard behavior can help improve breeding success of captive birds and aid future conservation efforts.

#### **Current behavior study at National Zoo**

A behavioral study of kori bustards has been ongoing at the Smithsonian National Zoological Park (SNZP) since 2000 and observations by trained volunteers have resulted in over 2500 hours of data. Volunteers record 63 behaviors as well as space utilization and crowd level data. The ethogram used by volunteers at SNZP was developed by S. Hallager using observations of captive birds, supplemented by published descriptions of wild birds (Lichtenberg and Hallager in press). Much of what is known about wild kori bustard behavior is descriptive, unsystematic and based on sightings of only one or two individuals. A long-term study of Namibian kori bustards, however, has been able to provide more detailed information (e.g. Osborne and Osborne 1998-2004). While SNZP's behavior study has been informative, the data is limited to the SNZP flock and may not be representative of kori bustard behavior in general.

#### **EthoTrak behavior study**

A greater understanding of kori bustard interactions with conspecifics, heterospecifics, humans and the environment at other facilities is a necessary first step towards development and implementation of effective captive management practices. Few

detailed descriptions of bustard behavior have been published, yet such manuscripts provide a valuable basis for quantitative study of behavior. Several institutions will be participating in a joint EthoTrak study on kori bustards. These include: Birmingham Zoo, Dallas Zoo, Living Desert, Reid Park Zoo and Smithsonian National Zoological Park.

With five facilities collecting data on kori bustards, we will be able to increase the sample size from five birds to eighteen birds resulting in a database that is more informative and representative of kori bustard behavior. Dallas Zoo is the only facility that currently parents rears kori bustard chicks. Using EthoTrak at this facility will allow us to collect data on dam/chick interactions. Several facilities have immature birds. Using EthoTrak at these facilities will enable us to track reproductive behaviors as these birds reach sexual maturity.

Comparison of kori bustard behavior with that of other species can highlight traits potentially shared by all or by specific groups of bustards, using the currently available behavioral information on all bustard species. Gaining a better understanding of kori bustard behavior, both in the wild and in captivity, is a necessary first step towards improving the husbandry and management of captive kori bustards and designing future conservation efforts that take into account all aspects of wild kori bustard life history and behavior.

For more information on EthoTrak, visit

[http://www.brookfieldzoo.org/pagegen/media/Ethotrak\\_Manual.pdf#search='ethotrak'](http://www.brookfieldzoo.org/pagegen/media/Ethotrak_Manual.pdf#search='ethotrak')

### **ASSESSING REPRODUCTIVE PARAMETERS IN CAPTIVE KORI BUSTARDS (*ARDEOTIS KORI*) USING NON-INVASIVE FECAL HORMONE ANALYSIS**

**(By Sara Hallager and Dr. Linda Penfold)**

For several years now, five zoos have been collecting fecal samples on birds in their flock and sending them to White Oak Conservation Center where Dr. Linda Penfold and her team analyze the samples for reproductive hormones.

#### **Background to the project**

When animals fail to breed in captivity, causes of the failure can often be determined through hormone evaluation. Hormonal evaluations historically used serum, obtained through invasive techniques, which required restraint of the animal. Such testing causes stress and risks affecting the overall health and reproductive status of the individual. Today, reproductive hormones also can be measured without the stress of capture and restraint through analysis of naturally excreted fecal samples. For a species such as the kori bustard, which historically, has succumbed to lethal and non-lethal injuries during capture and restraint, the opportunity to evaluate reproductive hormones through fecal collection is ideal.



The development of a self-sustaining population of kori bustards is a priority for the kori bustard Species Survival Plan (SSP) and this project is listed as a priority in the AZA 2003-2005 SSP Action Plan. Essential to achieving this goal is the need to better understand the factors affecting reproductive fitness in the species. A major challenge currently facing managers is determining why success rates vary between institutions as well as why some birds at successful breeding centers breed while others do not. Although husbandry practices have improved significantly over the past decade, the number of breeding individuals remains small and little is known about the reproductive physiology of these birds. Therefore, to assist in the captive breeding efforts and meet the goal of a self-sustaining population of kori bustards in the US, the objective of this project is to develop baseline information on the reproductive biology of the kori bustard.

Because of the low number of birds currently breeding in the population, the kori bustard risks becoming increasingly inbred. Lack of genetic diversity is one of the biggest problems encountered with captive breeding programs, and compromises the health and overall fitness of the population. With the future importation of wild caught kori bustards uncertain and an aging captive potential founder population, it is essential that as many wild caught birds as possible in the captive population breed in order to increase gene diversity and ensure the long term survival of the captive population. The potential founder birds range in age from 10-21 years with most birds at the end of the current longevity record. In order for these birds to breed, managers must gain a greater understanding of the biology of the species. Currently however, managers do not fully understand why some birds are breeding and why some are not even when housed under seemingly similar situations. Understanding the relationship between endocrine physiology and reproductive success may yield information on the proximate causes of breeding failure in the species. Such information will be important for improving husbandry practices in the captive population.

Our project analyzes fecal hormones from samples collected from kori bustards at the following participating institutions: Dallas Zoo, Denver Zoo, Sedgwick County Zoo, The Toledo Zoo, Smithsonian National Zoological Park and Zoo Atlanta.

#### **Preliminary results**

Fecal testosterone results from two breeding male kori bustards show that the breeding season for one male (98C313; A) started more than one month earlier than another male (2154461; B) and finished 4.5 months earlier (Fig 1 A and B). Further work is mandated to investigate whether the breeding season of the females is synchronized to the males. A failure to have coinciding breeding seasons might explain why some birds fail to reproduce.



Lara Metrione, White Oak, analyzing kori bustard fecal samples

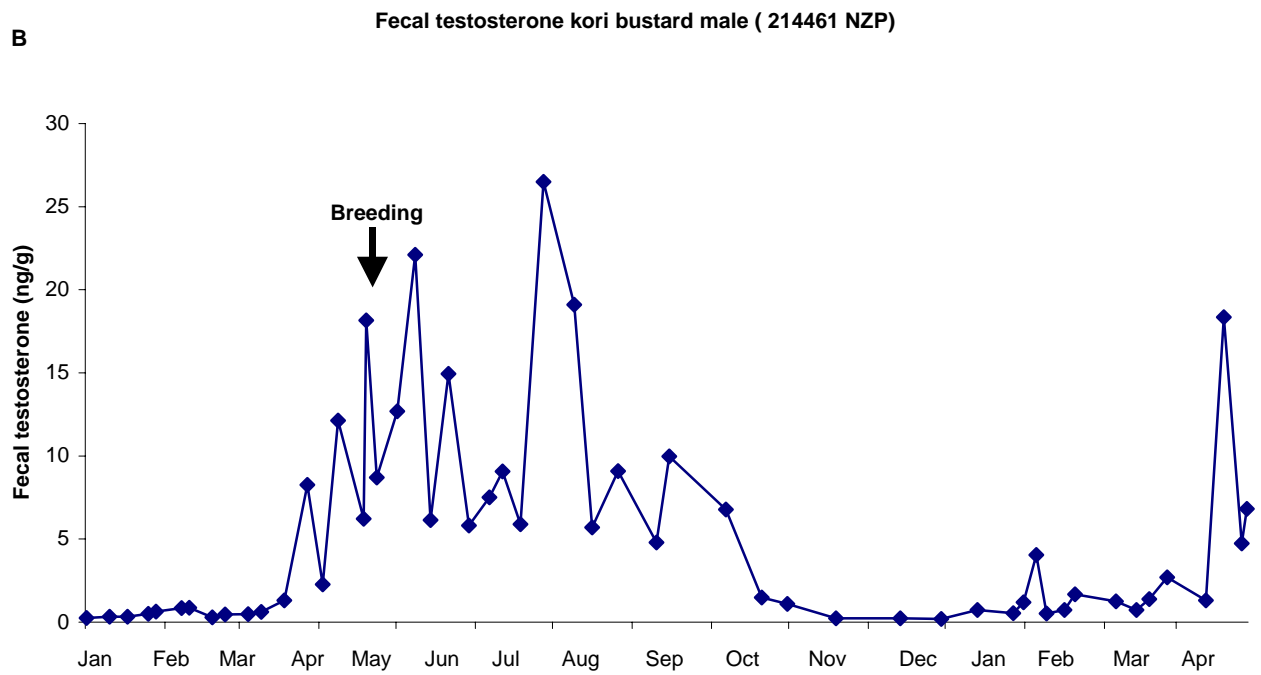
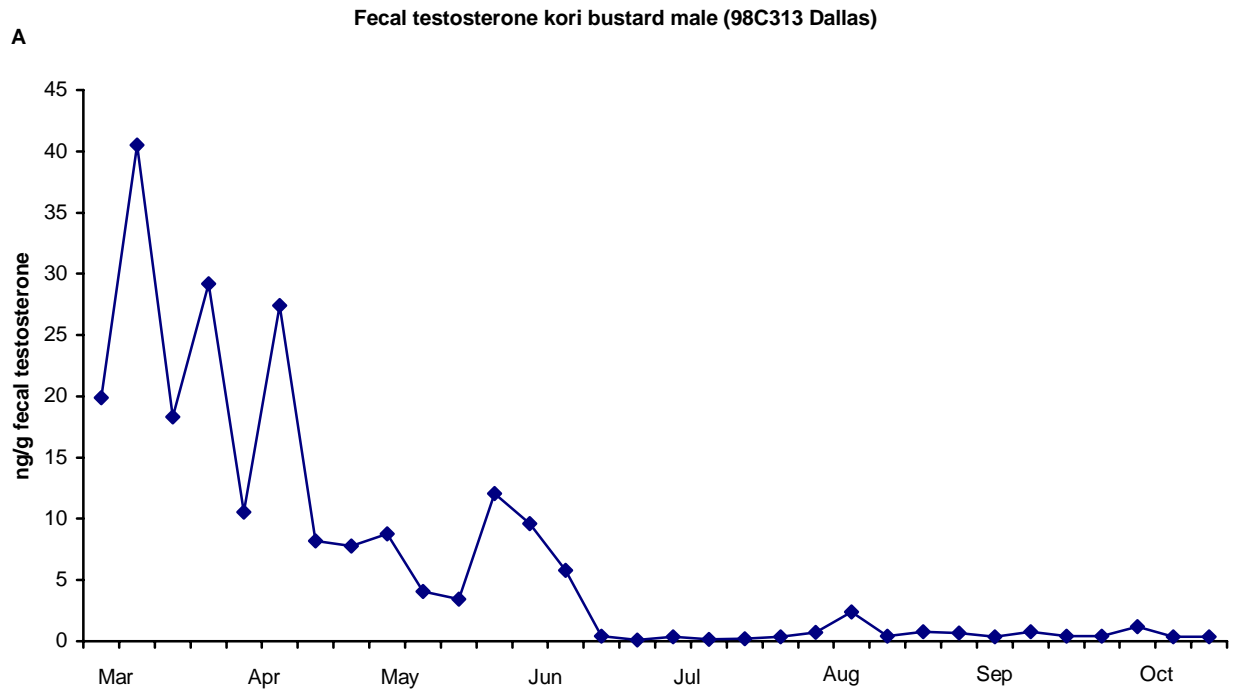


Figure 1. Seasonal changes in fecal testosterone concentrations in two male kori bustards.

## **KORI BUSTARD SSP THREE YEAR ACTION PLAN (2006, 2007, 2008)**

### **1) COMMUNICATION & FUNDRAISING**

- A. Finalize web page as the primary source for dissemination of information regarding kori bustard husbandry, conservation and educational programs.
- B. Continue fund raising efforts.

### **2) POPULATION MANAGEMENT**

- A. Increase target size to 100 birds. Continue efforts to breed founders.
- B. Increase number of institutions participating in the SSP so that target size can be reached.
- C. Send genetically surplus stock to facilities already identified overseas.



### **3) CAPTIVE STUDIES & HUSBANDRY GOALS**

- A. Identify factors necessary to get additional birds breeding. Complete hormonal research studies and publish results.
- B. Complete Veterinary section of husbandry manual.
- C. Document growth and development of chicks (through weight gains, photographs, and plumage changes).
- D. Continue to document adult (primarily male) seasonal weight changes in five institutions: National Zoo, Dallas Zoo, and Birmingham Zoo (need two other institutions to participate in the study). Expand weighing study to include monthly weights of chicks from birth through three years.
- E. Refine adult diet as well as chick rearing diet to that more appropriate of an omnivorous bird.
- F. Continue sending naturally molted feathers to J. McLain for distribution to fly tiers.

### **4) FIELD STUDIES**

- A. Support field work and research where needed (e.g. Botswana, Namibia, East Africa).

## 5) EDUCATION

- A. Identify areas of kori bustards to highlight (e.g. research, unique characteristics, natural history, economic challenges, etc.)
- B. Develop and distribute kori bustard education packets to all institutions housing koris to include biofacts, photos, sample research equipment, etc.
- C. Develop content for an educational sign to be permanently displayed at institutions housing koris. These signs should include kinetic, or moving, interactives with which to engage visitors.
- D. Develop both formal and informal educational talks for use at exhibits.
- E. Consolidate and distribute all research data to zoos including ways to adapt the data for educational purposes.
- F. Promote and support *in-situ* and field education and training regarding the kori bustard and its habitat.
- G. Train any institutions and educational staff interested in developing kori educational program(s).

### **THEY'RE HEEEEERRRE!!! (By Jamie Ford, Kori Bustard SSP Education Advisor)**

A while back many of you stated that you would be interested in buying a kori bustard egg and skull if it became available. Well, Bone Clones now has these items available and they look AMAZING! Thank you to David Kronen at Bone Clones! Skulls are \$160.00 and eggs are \$29.00 (not including tax and shipping). The creation of these items was a joint project with the Kori Bustard SSP and Bone Clones. Please consider adding a kori bustard skull and egg to your collections and thank you in advance!

The website for Bone Clones is:  
<http://www.boneclones.com>

\*The skull is item number BC-221

\*The egg is item number KO-439



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