

SHOEBILL SUCCESS



North America's first African Shoebill Stork chick hatches at Tampa's Lowry Park Zoo

By Dr. Lawrence E. Killmar

ON CHRISTMAS DAY 2009, Tampa's Lowry Park Zoo became the first wildlife institution in North America to hatch a rare African Shoebill Stork chick, and just the second institution worldwide. The chick began pipping at approximately 7:30 a.m. on Dec. 25, and was observed fully hatched, alert, and vocalizing by the evening of Dec. 26.

The species' numbers in captivity are few, with only 11 adult Shoebills in North

America, wildlife institutions, three of which are housed at Tampa's Lowry Park Zoo. The population of wild Shoebills is thought to number 8,000–10,000 with the species listed by IUCN as vulnerable, but difficult to estimate given the animals' native habitat of dense marches and swamps of East-Central Africa.

Known as one of the great bird species of Africa, Shoebills are tall (3.5 feet to 4 feet), darkly colored birds with unusually large bills up to 12 inches long and 5 inches wide that resemble the shape of a wooden shoe.

SYSTEMATICS AND MORPHOLOGY

The Shoebill (*Balaeniceps rex*) has long been considered a member of the order *Ciconiidae*. Recent studies however, indicate that it shares several skeletal characteristics with the heron family or *Ardeidae*. To complicate these taxonomic distinctions even more, the skull of this species shares many of the features found in pelicans or *Pelicanidae*. Most systematics still consider it to be the closest to storks but for the time being it has been placed in its own family and suborder *Ciconiiformes*. The most distinguishing

feature of the species is its large bill with mandibles capable of decapitating prey. Some biologists believe that this large bill might be used to burrow in the mud for dormant lungfish, Shoebill's favorite food. Regardless, this feature without question is the most striking characteristic of this species.

COLLECTION HISTORY

Tampa's Lowry Park Zoo first acquired, through importation from Tanzania, 2.2 Whale-billed or Shoebill Storks on Jan. 5, 2006. One of the birds from this import, indicated to be a male, died shortly after arrival on Feb. 22, 2006 and upon completion of the necropsy was discovered to be a female. That left 1.2 Shoebill Storks in the collection until a second import of 1.1 occurred on Dec. 3, 2007, also from Tanzania but through a different importer. With a total of 2.3 storks, it was decided, in the best interest of the species, to send the extra female to the San Diego Wild Animal Park in Escondido, Calif., to pair with one of the males there rather than housing this female in a non-reproductive situation. San Diego was chosen because it had held Shoebill Storks in its collection since the 1980s and had them housed in an exceptional offsite facility.

INITIAL BREEDING SUCCESS

In late 2008, it was decided to enclose with netting one of the lakes in the African habitat area at Tampa's Lowry Park Zoo to facilitate better management of several bird species including 7.7 Great White Pelicans, 3.3 Yellow-billed Storks, 40 Greater Flamingos and 1.1 Shoebill Storks. On June 9, 2009 the pair of Shoebill Storks were released into this naturalized enclosure called "North Lake" and to our delight they immediately settled into the habitat and were observed fishing for the stocked fish in the lake. Within a few months we observed the female starting to spend a great deal of time on a five foot-wide bank of the aviary and observed her periodically pushing the Fakahatchee



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Above, the chick pipping on Dec. 25, 2009. Previous page, the chick at 55 days old.

grass (*Tripsacum dactyloides*) strands down with her head and neck in an attempt to flatten the area. This was the first indication that perhaps she was interested in building a nest. Within weeks, we also observed both birds gathering grasses from other parts of the aviary and accumulating the material in this one location. At that point we provided additional grasses to help them form the nest.

On Oct. 3, 2009 the first egg was laid, three days short of the fifth month since the pair was moved into the free flight aviary. This is the first time that a Shoebill Stork has laid an egg in North America. Both parent birds were very active gathering additional nesting material and sharing with the incubation duties. We began observations and data gathering at once with the cooperation of our docent staff



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The Shoebill Stork chick was named Binti, meaning "daughter" in Swahili.

and keepers. We observed many of the behaviors documented in the wild, including their unique and interesting behavior of "showering" the egg with water to cool the egg.

On the morning of Oct. 13, 2009 at 9:30 a.m. the egg was found crushed in the nest and yolk material was observed on the male's breast feathers. Although no one observed what happen we assume that

he accidently stepped on the egg or that the egg was punctured by nest material. The egg measured 9.0 cm long by 5.75 cm wide and weighted 102 grams. During the incubation period we were in contact with staff members of the San Diego Zoo, the San Diego Wild Animal Park, and Parc Paradiso in Belgium. We received data on incubation and diets as well as information on the parent birds' behaviors. Parc

Paradiso recorded and verified the worlds' first egg and hatching of a Shoebill Stork outside its native range.

CONTINUED EFFORTS

As is the case with most stork species, the Shoebill Stork was expected to lay another egg 30 days after the loss of the first egg. True to form on Oct. 26, 2009, at 12:30 p.m. the birds were observed copulating and on Nov. 11 a second egg was discovered at 8:35 a.m. on the keepers first nest check. Forty-five days later, on the morning of Dec. 25, 2009, the chick was observed pipping and by 2:39 p.m. on Dec. 26, 31 hours later, the chick had entirely shed the egg shell. At 11:28 a.m. on Dec. 28 the first feeding was observed, which was approximately 45 hours after the chick hatched. At that time we began 12-hour-per-day observations by our keeper staff and for the next 25 days gathered data on the chick growth, feeding patterns and frequency, and parent birds' behaviors. As the chick matured and the feeding patterns were well established, we reduced the observation times and had our docents assisting as much as possible. With the observations of our parent-reared bird and the data from the incubated birds in Belgium, we have gathered very important detailed information that is very difficult, even impossible, to gather in the wild.

Since the week of Feb. 15 we observed the chick attempting to stand with more regularity as it reached its 60th day. The development and growth of the chick has been impressive. Along with our written observation data on both the parent birds and the chick, we have also photo documented the chick's progress and recorded weights and body measurements on two different occasions when we have removed the chick from the nest during severe inclement weather. Over the course of the next several weeks the chick's growth was remarkable. The stature of the chick changed from this very dependant fledging to a juvenile bird developing a noticeable independence from the adults. As the chick approached is 100th day we





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observed her walking off the nest more and more and venturing along the shoreline of the pond.

On April 26, 2010, the 120-day-old chick fledged and was observed flying for the first time. This was the culmination of one of the most noteworthy avian collection accomplishments in the history of Tampa's Lowry Park Zoo as well as a milestone in North America. Since that day the chick has weaned herself from the parents' daily care and has taken her place within the aviary, fishing and exploring her new environment.

In conducting research on this species it appears that the chick transitions three very distinct stages of development, as recorded in the wild and observed with this chick:

STAGE 1: Day 1 to 35 the chick is unable to stand requiring constant brooding and protection from the elements by the parent birds.

STAGE 2: Day 36 to 75 the chick can stand and sits on tarsi and requires less brooding by day. It will seek protection from the elements if the adults are on the nest. Also adult feather development begins.

STAGE 3: Day 76 to 95 the chick's growth is rapid and the parent birds will leave the chick for long periods of time. At the end of this stage the chick will walk off the nest on its own accord and soon after begin to fly.

DIET AND HUSBANDRY

For the first eight weeks post hatching, the adults were offered small trout, capelin, and smelt. On the recommendation of the Parc Paradiso staff, and in an effort to facilitate digestion of the regurgitated food for the chick the heads, tails and gills were removed from the trout and capelin, the smelt were left whole. . During that same period the chick was offered chopped rat pups with the milk stomach and heads removed and the smelt heads, capelin heads, tails and gills were also removed. This feeding strategy was recommended by the staff at Parc Paradiso and as called for in the Saddle-billed Stork Hand-rearing Protocols. During the period leading up to the



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Parent and Shoebill chick at 41 days old.

unseasonable hard freeze in Tampa, in mid Jan. 2010, the adults were also fishing in the lake which was primarily stocked with Tilapia. The resulting freeze killed all stocked fish in the enclosure. Starting on Feb. 2, 2010 the chick was offered a 20g Bird of Prey meatball with vitamins and minerals (Nekton-Bio and Nekton-MSA) twice a day for one week, then reduced to once a day. This continued until March 4, 2010. When the chick would no longer eat the meatball we began putting the vitamins and minerals in a small trout. After eight weeks we offered the adults and the chick whole trout, capelin and smelt and in addition the

chick received whole rat pups. In March we began re-stocking the lake with Tilapia to encourage the Shoebills and our other fish-eating birds to naturally fish once again.

SIGNIFICANT HUSBANDRY EVENTS

FEB. 2 (39 DAYS OLD): The chick was brought to the clinic presenting lethargy and inability to hold up its head. The medical staff administered antibiotics, fluids, vitamins, minerals and a blood sample was taken. The blood sample indicated that the chick was anemic. The chick was returned to the nest after treatment and its condition improved through-out the day. We then



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The darker Shoebill chick, with a parent, at 104 days old.

began offering the 20g Bird of Prey meatball as mentioned above. Weight: 1.77 Kg, Temperature 98.6 (cloacal), Heart rate 140.

FEB. 3 (40 DAYS OLD): The chick was brought to the clinic for a follow-up examination, administration of fluids, vitamin and minerals. Fecal sample was taken and was negative for parasites. Weight: 1.91 Kg, 7.9 percent weight gain.

FEB. 4 (41 DAYS OLD): The chick was brought to the clinic for re-examination and administration of fluids, vitamins and minerals. Weight: 2.10 Kg, 9.9 percent weight gain.

FEB. 5-7 (42-44 DAYS OLD): Chick

was treated at nest, given fluids, vitamins and minerals.

FEB. 8 (45 DAYS OLD): The chick was brought to the clinic for a follow-up examination and blood chemistry. All appeared to be normal. Weight: 2.360 Kg, 12.4 percent weight gain.

FEB. 10 (47 DAYS OLD): An unusually strong cold front and heavy rain was predicted for the Tampa area. After consultation with Mike Mace, at the San Diego Wild Animal Park, to determine the best course of action to ensure the survival of the chick, it was decided to pull the chick overnight. The chick was

so large that the parents could not provide the chick complete protection from the elements. It was decided to collect the chick close to sundown and place it in the brooder room of the aviary inside a crate and conduct periodic overnight observations. The chick was then returned to the nest at day break (7:30 a.m.) the next day and the parents immediately returned to the nest to tend to the chick. Weight: 2.54 Kg, 7.6 percent weight gain.

MARCH 4 (69 DAYS OLD): The chick was transported to the clinic for routine examination and to draw blood for sex determination. Weight: 4.40 Kg, 73.2 percent weight gain. DNA test results received on March 12 indicated the gender to be female.

MARCH 24 (89 DAYS OLD): The chick was transported to the clinic for routine examination and banding. The chick was also measured. 39.7 inches (100.8 cm) tall. 29.9 inches (75.9 cm) long from tip of bill (neck relaxed and pulled back) to tip of tail. Weight: 5.08 Kg, 15.5 percent weight gain. Banded 25 white on black.

COLLABORATIVE EFFORTS

Throughout the course of the past eight months we have been in contact with the staff members of Parc Paradiso, (Belgium), the only other facility in the world to produce a Shoebill Stork chick. We have also stayed in touch with San Diego Zoo where this species has been held for the longest period of time in North America. Advice and guidance from these two facilities have been invaluable. We have been discussing possibilities of transferring birds between Tampa and San Diego in the coming years to facilitate reproduction. The Cincinnati Zoo has also indicated interest in revitalizing its breeding program for Shoebill Storks. The gender of the bird was determined on March 12, 2010, by DNA using Avian Biotech International Laboratory. When the chick reaches maturity she will be placed with the best possible mate choice available in this country within the five institutions that presently exhibit this species.

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FIELD RESEARCH

Tampa's Lowry Park Zoo is funding primary research by Mr. Jasson John, a Ph.D. candidate in the Department of Forest Sciences, Seoul National University, Seoul, South Korea, and an Assistant Lecturer in the Department of Zoology and Wildlife Conservation, University of Dar es Salaam, Tanzania. The title of his research study is "Ecology and Conservation of the Shoebill and Cranes in the Malagarasi-Moyowosi Flood Plain Ecosystem, Tanzania." His research will center on the Shoebill Stork and Wattled Cranes species with specific focus on the following objectives:

1. Study of the vegetation in relation to spatial-temporal pattern of the study species.
2. Monitor the hydrology in selected sites within the wetland.
3. Determine breeding requirements by characterizing biotic and abiotic variables at their nesting sites.
4. Assess availability and accessibility of food resources (tuber and small aquatic animals) in selected wetland segments.
5. Monitor local movements of the study species between wetland segments.
6. Assess the current and potential threats to Shoebill and Crane habitats.

The Shoebill Stork breeding program at Tampa's Lowry Park Zoo is made possible by Triad Foundation. The Zoo's Ituri Forest habitat area, which houses the North Lake aviary, was made possible by funding provided by the Hillsborough County Board of County Commissioners.

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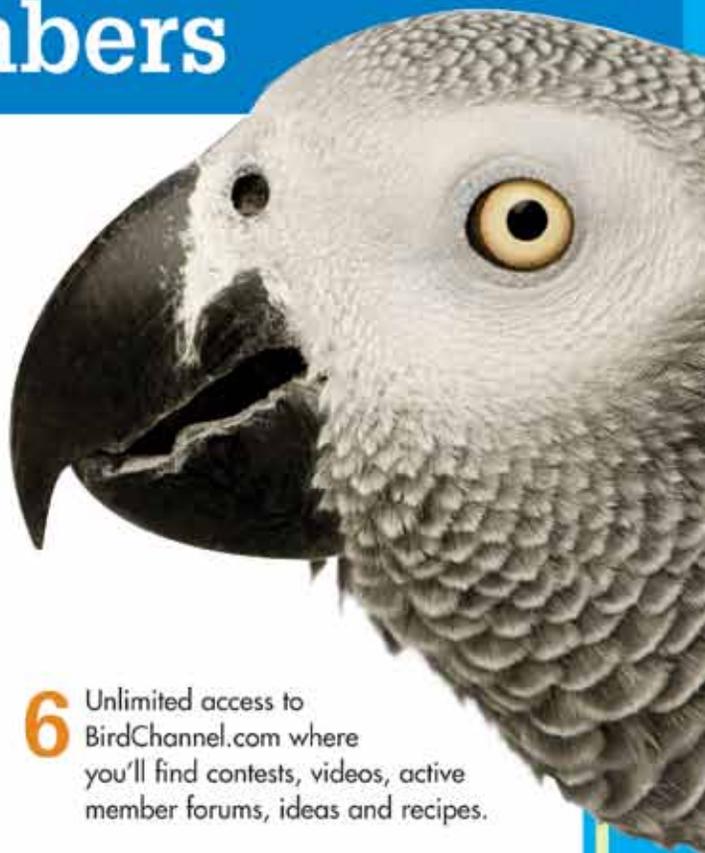
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