



**INTERNATIONAL STUDBOOK**  
for  
**BONGO ANTELOPE**  
*(Tragelaphus eurycerus isaaci)*

**Year 2003 Historical Edition, Volume XVIII**

**Lydia Frazier Bosley**

**Studbook Sponsor: Fort Worth Zoo**

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*(Tragelaphus eurycerus isaaci)*

**Year 2003 Historical Edition, Volume XVIII**

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This international studbook is authorized and approved by the Committee on Inter-Regional Conservation Coordination (CIRCC), recognized and endorsed by the International Union of Directors of Zoological Gardens/World Association of Zoos and Aquariums (IUDZG/WAZA) and The World Conservation Union /Species Survival Commission (IUCN/SSC), endorsed by the American Zoo and Aquarium Association/Wildlife Conservation Management Committee (AZA/WCMC), approved and supported by the AZA Antelope Taxon Advisory Group, and sponsored by the Fort Worth Zoo.

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## **Preface**

This 2003 historical edition of the international bongo studbook is an effort to come up to the standards suggested by the AZA Conservation Program Resources Guide, as well as the expectations of the International Studbook Rules and Regulations, and as such includes some new sections, e.g. notes on bongo taxonomic classification, geographic and chronological scope, details on the physical characteristics, behavior and habits of the animal, and a demographic and genetic analysis of the captive population by an expert in the field, Robert J. Wiese of Fort Worth Zoo, chair of AZA's Small Population Management Advisory Group.

I am also pleased to enclose a brief note on the bongo repatriation project, by Ron Surratt, Fort Worth Zoo's mammal curator, AZA's Bongo SSP Coordinator and BRAG member. An extensive "bongo bibliography" is also included, citing articles from the 1800's through the present, with a number of pieces in German plus a few in French, Italian and Japanese.

Finally, as usual, the data lists include a chronological historical account of all known animals ever in captivity, as well as a "by location" listing of bongo currently alive. Bongo holders are kindly requested to look over the details pertaining to your animals and to let me know immediately of any errors or omissions. Thanks as always for your cooperation in providing regular data updates.

## **Acknowledgements**

Appreciation is due for Fort Worth Zoo's continued sponsorship of the bongo studbook, and for the contribution of articles by Ron Surratt and Robert J. Wiese. I would also like to recognize Laurie Bingaman Lackey of ISIS for her invaluable help on the technical / SPARKS aspects of maintaining the studbook. Special thanks go to Jeffrey E. Wells of Orlando, Florida for the creation and permission for use of his beautiful cover artwork. Thanks also to my husband Chris Bosley for help with list-checking and proofreading, and to my brother in law Mike Cooper for computer troubleshooting.

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# Introduction

## Systematics of Data Collection

The studbook data are the result of a joint cooperative effort among all holders of bongo in captivity and the studbook keeper. Once a year, usually at the end of December, this studbook keeper sends out a request for updates in each location's bongo population – births, deaths, transfers, and any other relevant changes. As of this year the request was made via email. Many bongo holders respond quickly, but for those who don't, reminders are sent out after a few weeks, and if necessary, a third and usually final time.

Whatever information is reported for the preceding year is entered in the studbook's data base via the SPARKS (Single Population Analysis & Records Keeping System) program, and frequently there is additional correspondence to clear up questions or discrepancies. For the few locations which do not respond to inquiries, animals not reported by any source for the preceding two years will likely be designated 'lost to followup' and their listings will only appear in the historical edition of the studbook every three years; they will not appear in "currently living" accounts.

## Common and Scientific Names

This studbook's population data concerns the Eastern or "Mountain" Bongo (Kingdon, 1997), usually referred to currently as *Tragelaphus eurycerus isaaci*; the Western or "Lowland" Bongo is known as *T. e. eurycerus*. Apart from 2 or 3 individuals of the Western race which did not reproduce, all captive bongo emanate from the small founder group captured in Kenya, and are known to be the Eastern/Mountain or "*isaaci*" subspecies.

*Tragelaphus eurycerus* is roughly translatable from the Greek as "broad-horned goat antelope". Due to the distinction of being the only spiral-horned antelope (tragelaphid) in which both sexes have horns, bongo have been difficult to classify. For a while grouped with eland (*Taurotragus*), bongo have also in the past been given their own genus, *Boocercus*, which is still in limited use (e.g. the Kenya Wildlife Service website shows *Boocercus* (sic) *aerycerus*). The majority of references (e.g. Walker's Mammals of the World) use the genus *Tragelaphus*, but a number use the species variant *euryceros*.

In a comprehensive listing provided by author Katherine Ralls (1978), quite a few subspecies were named (as follows) but the distinctive characteristics (paler or darker coats, more or fewer stripes, two or three cheek spots, etc.) ascribed to the different types were as likely to be those of individuals as they were those of whole subspecies. At any rate here are some of the variations:

*Antelope eurycerus* Ogilby, 1837a: 120. (not *euryceros* as in Lydekker & Blaine, 1914) Type locality, West Africa.

*Tragelaphus eurycerus* Lesson, 1842: 181, first use of the name combination (confusingly enough, Ralls starts out her piece by attributing this also to Ogilby, 1837, and most references do the same)

*Tragelaphus albo-virgatus* du Chaillu, 1861a: 299. Type locality Ashkankolo Mountains, Gabon.

*Boocercus eurycerus isaaci* Thomas, 1902: 309. Type locality Eldoma Ravine, British East Africa (Kenya).

*Boocercus eurycerus katanganus* Rothschild, 1927: 271. Type locality Katanga Province...Belgian Congo (Zaire).

*Boocercus eurycerus cooperi* Rothschild, 1928: 306. Type locality, Haut Uele District, Belgian Congo (Zaire).

*Boocercus eurycerus eurycerus* Dollman, 1928. "Typical race, found at Gold Coast, Ivory Coast, Sierra Leone, French Congo, Ashanti"

*Taurotragus eurycerus* Knorck, 1984 (in German)

### **Common names :**

In European and Scandinavian languages (Dutch, Danish, English, French, German, Spanish, Swedish) "bongo" is used, sometimes in combination with various spellings of "antelope".

The many African languages seem to have fairly distinctive names, as follows: Ashanti – **Trom**; Bila – **Soli**; Fanti – **Bongo**; Kikuyu – **Ndongoro**; Kiladi – **Njiogika**; Kipsigi – **Sirogoyta**; Lomongo – **Mongo**, **Mpanga**; Marakwet – **Siribeyi**; Pahouin – **Ezona**; Sebei – **Solugot**; Swahili – **Mbewala**; Teke – **Mboono**; Yoruba – **Otolo**; Zande – **Mbangana**.

## Ecology of Wild Populations

**Physical characteristics:** Bongo are large-bodied, relatively short-legged antelope with long spiraling horns which make one complete twist from base to tip. Described as 'among the most beautiful of bovids' (Nowak, 1991), the rich chestnut of the coat is striped with thin white vertical lines along the sides (10-16 on each side), and the face and legs have patches of black and white, with white chevrons on the breast and below the eyes. Older males mature to a dark mahogany, with buff-colored striping. Average head and body length range between 170-250 cm (5.6 - 8.3 feet), shoulder height is 110-140 cm (3.6 - 4.6 feet) and weight for adult males averages 300 kg (ranging from 240-405 kg or 525-880 pounds) and for females 240 kg (210-253 kg, or 460-560 pounds). Kenya bongo are consistently heavier and taller than those of West Africa. Females' horns are typically longer, narrower and straighter than those of males (Kingdon, 1989).

**Social Behavior:** The bongo is a gregarious, non-territorial ungulate. Small groups vary from 2-3 adults to an average of nine including offspring, and larger 'nursery' groups often aggregate after the calving period (July - September) for group security. An older cow may 'scout' an area alone for safety and then return followed by her band. Vocalizations are limited; males grunt and snort, females have a weak mooing contact call with young, and all classes bleat in distress. The gestation period is nine months, and weaning occurs at about six months. Sexual maturity is reached at less than two years (20 months) and average lifespan in the wild is said to be around 12 years. (Animals in captivity routinely live into late teens and a few age over 20 years.) In the southern Sudan, Hillman observed groups of up to forty-four, with all ages and both sexes, and sometimes more than one adult male; herds of 50 have been recorded in the Aberdares. Though typically males are solitary, occasionally older bulls are accompanied by much younger ones. Large groups are more relaxed, usually making way for buffalo, rhino or elephants, but fearless even of predators. One female in a large nursery group made a determined charge at a passing hyena, and another was seen striking a giant forest hog.

**Diet:** A varied diet of browse from trees and undergrowth includes tips, shoots, trailers, buds, tender brush, roots, bamboo leaves, cassava, sweet potato leaves, and coco yam. Bongo have been observed browsing standing on hind legs with forelegs braced against tree trunks, and can reach up to 2.5 meters (over 7 feet) They have also been seen consuming charred wood from forest fires (Nowak, 1999).

**Habitat:** In general the bongo inhabits lowland forest for most of its range; the subspecies in Kenya lives in montane forests at 2000 - 3000 meters altitude. They are at home in the densest, most tangled part of the undergrowth and are very shy and furtive. Bongo can disappear quickly when startled, and they escape easily through their surroundings with heads up and horns held against their backs. Bongo have been described as diurnal, but one researcher (Hillman, 1986) has observed most activity from dusk to early morning.

## **Status of Wild Population**

### **Conservation Status:**

According to the **IUCN Red Data Book** the lowland bongo, *T. e. eurycerus*, is near threatened, and eastern/mountain *T. e. isaaci* is endangered (EN B1 + 2b) [This means that (B) the extent of occurrence is estimated to be less than 5000 sq. km or the area is less than 500 sq. km and estimates indicate (1) a population severely fragmented or known to exist at no more than five locations and (2b) a continuing decline is inferred, observed or projected in the area of occupancy.]

**CITES** regulates international trade at the species level, with (*T. eurycerus*) bongo listed on Appendix III in Ghana, 1976, and Denmark 1977 III/r, 1984 III/w.

The **U.S. Fish and Wildlife Service** does not list bongo or *T.e.* species.

### **Cause of Decline in Wild Populations:**

According to the Kenya Wildlife Service website (kws.org), in “History of the Aberdare Bongo”, the wild population was severely damaged in the 1980’s by an outbreak of rinderpest, probably due to cattle (prime carriers of the disease) within the park boundaries. In addition, an increase within the last 50 years of hunting with dogs for bush-meat and skins has contributed to the decline. The historic predator for mountain bongo was leopard, but apparently lions were introduced in the 1930’s; according to a Daily Nation article in 2000, “recently 200 lions were culled to protect the rare bongo species, which...has dropped to just about 100 in the Aberdares, alarming conservationists.”



copyright - Iris Hunt

“Miss Kenya”, first Kenya-born offspring of repatriated bongo from U.S.

## **Distribution of Wild Population**

### **Historical/Former Range:**

**Range:** The Western race occurs from Sierra Leone to Katanga, patchily distributed with major concentrations in central Africa - Cameroon, Central African Republic, Congo-Brazzaville and Congo-Kinshasa. Distribution and numbers have declined due to habitat destruction and over-hunting, particularly in West Africa, where they are now reasonably common in only a few individual wildlife parks in Liberia, Ghana and the Ivory Coast.

The Eastern or mountain race is endemic to Kenya, the last known individuals in Uganda having been killed in 1913. Three areas in particular (ASG Report, 1998) are thought to be the last strongholds; the Aberdares (numbers mentioned from 50 to the low hundreds), Mt. Kenya (now very rare and seldom seen) and the Mau Forest, subject to increasing pressure from surrounding agricultural development and low conservation status (East, 1998).

### **Current Distribution:**

CITES lists the following countries as species (*T.e.*) habitat currently: Angola, Burkina Fasso, Cameroon, Central African Republic, Congo, The Democratic Republic of the Congo, Cote d'Ivoire, Equatorial Guinea, Ethiopia, Gabon, Ghana, Guinea, Guineau-Bissau, Kenya, Liberia, Mali, Niger, Sierra Leone, Sudan, Togo [RE?], Uganda [RE].

Although mountain bongo are nowadays rarely seen, and numbers (from "around 50" to "in the hundreds") given have always been rough estimates or guesses, a new report from the Kenya Wildlife Service is cause for optimism re: the Aberdares population:

"On Monday the 12<sup>th</sup> of January 2004, just after 8.30am, Corporal James Nyagah of Kenya Wildlife Service got close enough to a wild male Bongo in the Aberdare NP to take a photograph. This is thought to be the first photograph taken of a Bongo in the Aberdares for over a decade.

Cpl Nyagah tracked the group of an estimated 14 Bongo through very thick vegetation that is common in the Aberdare forests. The donation of cameras by The Bill Jordan Wildlife Defence Fund has enabled photographic evidence to be recorded proving the increasing population of Bongo. This is a testament to the recuperation of the Aberdare ecosystem.

The KWS Surveillance Program with the support of several other donors is now fully operational. Already several different herds of Bongo have been identified and their locations recorded. Once complete, the program will give a fairly accurate indication of numbers and dispersal of Bongo within the Aberdare ecosystem." (from KWS Website, News - [www.kws.org](http://www.kws.org) )

## **Mountain Bongo Repatriated to Kenya**

**Ron Surratt, SSP Coordinator, BRAG Member**

The Mountain Bongo Repatriation Group (BRAG) realized the completion of a 17-month effort that began in August 2002 and ended in January 2004, with the successful transport of 4.14 bongo from the United States to the Mount Kenya Game Ranch in Nanyuki, Kenya. All 18 animals arrived in good condition and were placed in a newly constructed complex of nine bomas on the Eastern edge of the Game Ranch adjacent to a forested area, which includes the Nanyuki River. Five days after their arrival in Kenya, one female gave birth to the first Kenya-born bongo from American stock. These animals form the core breeding group, whose offspring will be candidates for future reintroduction onto Mount Kenya.

The BRAG, whose members are Don Hunt, Mount Kenya Wildlife Conservancy; Mark Davis, DVM and Director of Peace River Refuge; Ron Surratt, AZA Bongo SSP Coordinator and Curator of Mammals, Fort Worth Zoo, and Paul Reillo Ph.D., Director of Rare Species Conservatory Foundation, would like to thank our partners and participants in the effort:

African Safari Wildlife Park  
Busch Gardens  
Cape May County Zoo  
Calgary Zoo  
Columbus Zoo  
Donner Foundation  
Disney's Animal Kingdom  
Endangered Wildlife Breeding & Conservation Centre  
Exotic Wildlife Association  
Fort Worth Zoo  
Houston Zoo  
Jacksonville Zoological Park  
Los Angeles Zoo  
Milwaukee County Zoo  
Oregon Wildlife Foundation  
Peace River Refuge  
Purina Mills  
Rare Species Conservatory Foundation  
Sacramento Zoo  
St. Louis Zoo  
Tulsa Zoo  
United Nations Foundation  
White Oak Conservation Center  
Zoological Society of San Diego

# Captive Population

## Demographic and Genetic Analysis by Robert J. Wiese, AZA SPMAG Chair

### DEMOGRAPHY

The international bongo population as of 31 December 2003 was 526 (204 males; 317 females; 5 unknown) located at 118 institutions throughout the world. The age distribution (Figure 1) for this population shows a balanced population with a slight deficit in births over the past year. There may be several more births in these years, but there is often a lag in reporting births to the studbook keeper by some institutions.

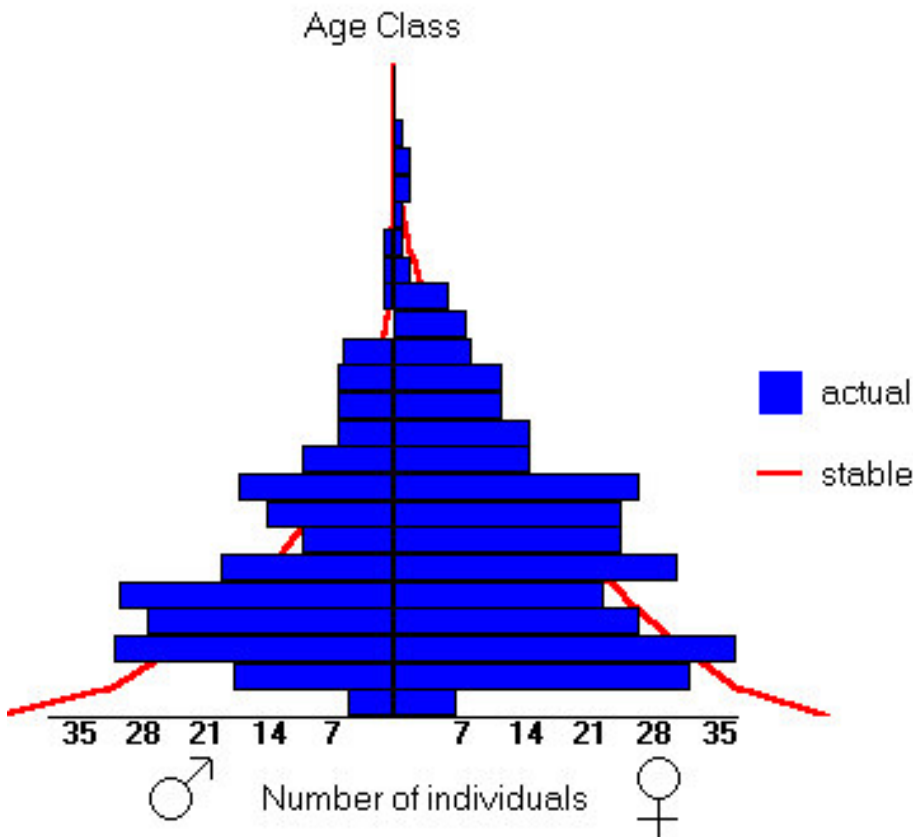


Figure 1. Age distribution of the International Bongo Studbook as of 31 December 2003.

The bongo population shows a significant capacity for growth. The census graph (Figure 2) shows a steady increase in population since the initial imports in 1964. Since 1980 the average annual growth rate has been greater than 9% ( $\lambda = 1.0933$ ) and the greatest rate is well above of 10%. The generation time over this period since 1980 has averaged 6.5 years. Figure 3 shows that the entire population is now captive-born with no wild-caught founder animals still alive in the population.

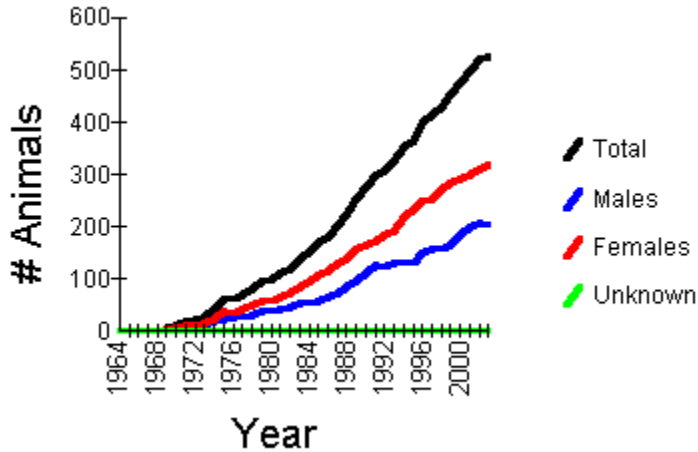


Figure 2. Census graph of the male, female and total bongo in the International Bongo Studbook from 1964 through 31 December 2003.

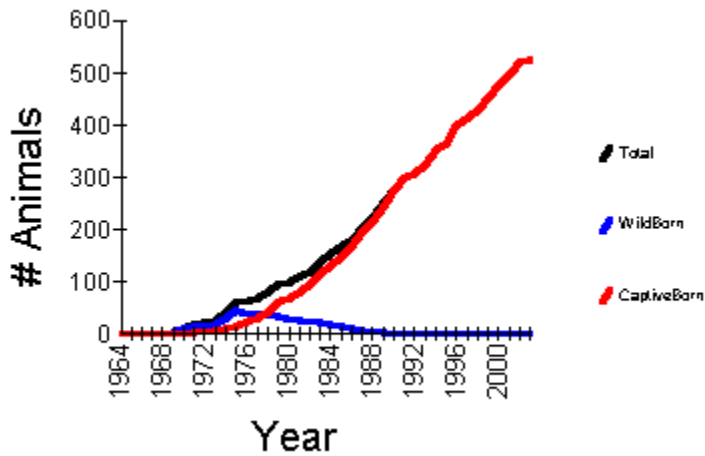


Figure 3. Census graph of the wild caught, captive born and total bongo in the International Bongo Studbook from 1964 through 31 December 2003.

The fecundity ( $M_x$ ) pattern for male and female bongo is shown in Figure 4. Bongo can begin breeding sometime before they are two years of age, but more typically begin reproducing at age 2-3. They can continue to reproduce until their late teens, however the  $M_x$  peak for late teen males is due to low sample size variation and is not a true biological rise in reproductive capacity. Likewise the dip in male reproductive competence in the early teens is probably due to past management practice rather than a true decline in capacity.

Mortality ( $Q_x$ ) for the bongo is shown in Figure 5. Since 1980 first year mortality for male and female bongo has been 28% and 22%, respectively. The oldest male bongo lived until 19 years and the oldest female lived to 23 year of age. The median survivorship ( $L_x = 0.50$ ) is 7 years and 9 years for male and female bongo, respectively.

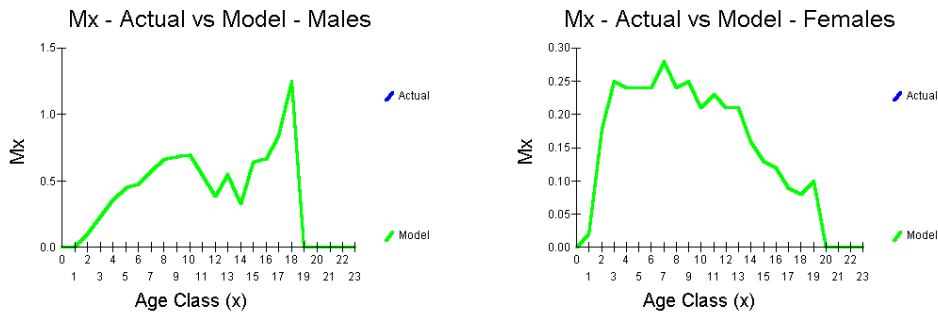


Figure 4. Fecundity graphs for male and female bongo in the International Bongo Studbook between 1980 and 2003.

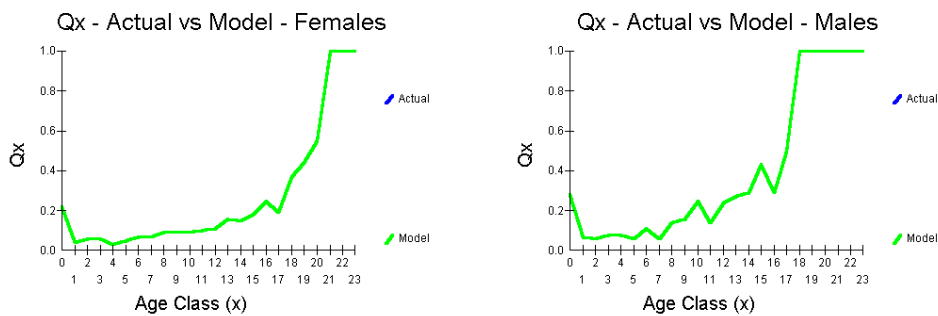


Figure 5. Mortality graphs for male and female bongo in the International Bongo Studbook between 1980 and 2003.

## GENETICS

The international bongo population is descended from 38 founder animals with no living wild caught animals still alive as potential founders. The founder representation is shown in Figure 6. Many of the founders are highly represented in the descendent population and a number were never adequately represented for various reasons. The descendent population as of 31 December 2003 possessed 95.8% of the wild gene diversity with a potential of 97.8%. This translates into 11.85 founder genome equivalents (FGE) currently with a potential of 22.37. Increasing the underrepresented founder lines to make them more equal to those that are currently overrepresented will move the population toward these potentials. The current average inbreeding coefficient is still fairly low ( $F = 0.08$ ), but in a closed population with no further imports of unrelated animals, inbreeding will increase. Only 5% of the international population is unknown. While this is higher than desired, it is actually quite low compared to other antelope species that are more often kept in larger herds than bongo.

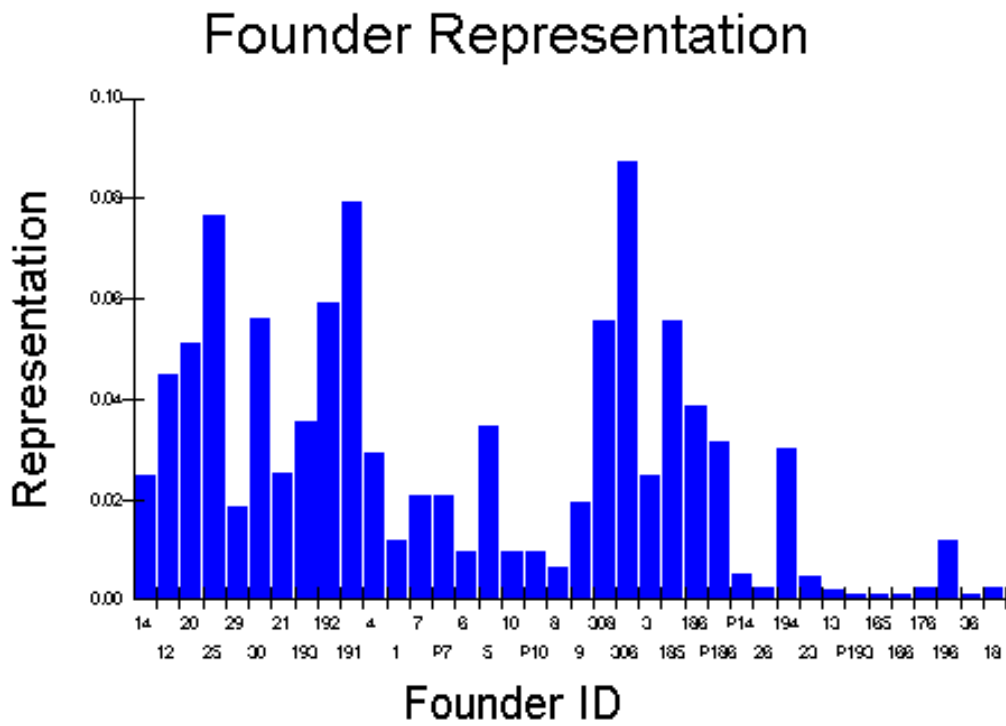


Figure 6. Founder representation graph for bongo in the International Bongo Studbook as of 31 December 2003.

## 2003 Statistics Summary

### Global Totals for Bongo Living as of 31 December , 1999 – 2003

1999: 170.288 = 458  
 2000: 186.295 = 479  
 2001: 200.300 = 500  
 2002: 210.310 = 520  
 2003: 206.318.2 = 526

### 2003 Regional and Global Totals for Births, Deaths and Living

	Births	Deaths	Living 31 Dec. 2003	
Americas	13.17.1(31)	12.16(28)	101.150.1(252)	57
Europe	13.20.1 (34)	17.15(32)	74.127.1(202)	45
Asia	1.2 (3)	2.2 (4)	19.24 (43)	8
Africa	1.2 (3)	1.2 (3)	8.15 (23)	3
Australia	1.0 (1)	0	4.2 (6)	3
<b>Global</b>	<b>29.41.2(72)</b>	<b>33.33 (66)</b>	<b>206.318.2 (526)</b>	<b>116</b>

/

The last number to the right shows the number of locations

With breeder numbers recently updated, it may be of interest to see some of the total numbers of births ... here are the top ten:

White Oak Conservation Center	YULEE	114
San Diego Wild Animal Park	SD-WAP	107
Zool. Garden Dvur Kralove	DVURKRALV	82
Zoologischer Garten Berlin	BERLINZOO	55
San Diego Zoo	SANDIEGOZ	50
Gladys Porter Zoo	BROWNSVIL	44
Mt. Kenya Wildlife Conservancy	NANYUKI	43
Wilhelma Zoo	STUTTGART	41
Taipei Zoo	TAIPEI	35
Marwell Zoological Park	MARWELL	31

## **General Information about the Bongo Studbook**

### **Geographic Scope:**

This is an international studbook covering all known captive bongo throughout the world. Currently, bongo are kept in Canada, the United States, Mexico, Puerto Rico, Argentina, Chile, Russia, Japan, the Republic of China, Singapore, Australia, Belgium, Denmark, France, Italy, the Netherlands, Poland, Portugal, Spain, Switzerland, Germany, Czech Republic, Slovakia, England, Ireland, Wales, Kenya and South Africa.

### **Chronological Scope:**

The bongo studbook's earliest entry concerns "Doreen", the female captured in 1932 and imported to New York's Bronx Zoo; she lived to the age of nineteen. In 1935/36, London and Rome zoos each imported a pair, to result in a global captive population of five. In 1969/70 began the serious efforts to bring bongo to zoological parks and by 1975, the final year of most of the 62 captures from the wild, the group numbered 25.39 (64). The captive population has grown steadily since then.

### **Studbook Keepers and Special Articles/Events:**

Jean Akers, former mammal curator at Boston's Franklin Park Zoo, was the first bongo studbook keeper; she produced North American Regional studbooks in 1982, 1983 and 1984, and then International studbooks in 1985, with a "historical overview", and in 1986.

Mike Crotty, registrar at Los Angeles Zoo, took over the international studbook, producing the sixth volume in 1989, and continuing thereafter with annual editions through 1994 (Vol. 11). The 1991 edition included the first bibliography of bongo articles. Sadly, Mike passed away in 1997.

Lydia Frazier Bosley, at the time an animal keeper at L.A. Zoo, attended the AZA Schools Studbook Class in 1998, and produced annual international editions for 1997 through the present. The historical 1997 edition included an article by Carole Udell on bongo husbandry from the International Zoo Yearbook (1984).

Volume 13 in 1998 contained the bongo section of Rod East's IUCN/SSC Antelope Specialist Group Report, and the AZA Antelope TAG's minimum husbandry guides. AZA's Bongo Species Survival Program came into being in 1999, with Fort Worth Zoo's mammal curator Ron Surratt as SSP Coordinator.

Volume 15 in 2000 included Bodo Brandt's extensive captive history article entitled "Remarks on the husbandry and breeding of bongo with special consideration of European zoos", plus remarks from Rod East, Dr. Richard Estes and Tom Butynski on the possibility of a reintroduction project.

Volume 17, 2002, contained "Bongo Calf Splaying and Coxofemoral Luxation" (L.F. Bosley). In 2001 bongo studbook sponsorship passed from L.A. Zoo to Fort Worth Zoo. In early 2004 Jake Veasey of Woburn Wild Animal Kingdom Ltd. became the Bongo EEP Coordinator.



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drawing c. by Jeffrey E. Wells

## **Bongo Bibliography Notes**

This bibliography began from a series of reprints passed on to me by former studbook keepers Jean Akers and Mike Crotty, and grew with help from Los Angeles Zoo librarian, Luz Morales.

Augmentation to the list has come through the National Information Services Wildlife Worldwide CD, and internet research on various DIALOG databases including Biological Abstracts, Biological & Agricultural Index, BIOSIS, CAB Abstracts, Life Sciences Collection, Pascal, Science Citations Index, Web of Science and Zoological Record. Thanks to Susan at the OSU/Hatfield Marine Science Center Library in Newport, Oregon, for help with research.

A 1978 article by Katherine Ralls also provided an excellent reference for additional earlier articles, added in to the current list.

The bongo studbook files contain a number of reprints and any additional contributions are welcome.

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