

**BLACK RHINOCEROS (*Diceros bicornis michaeli* and *Diceros bicornis minor*)**

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**Introduction**

Population genetic analyses has shown that the minimum population size (MVP) for black rhinos in order to maintain 90% of original genetic diversity for 200 years is 150 animal spaces split up into 75 *michaeli* and 75 *minor*. At the present time, there are 68 *michaeli* in 24 institutions and 28 *minor* in 11 institutions for a total of 96 animals in 35 institutions in North America. Even though the goal is to preserve 90% of the average heterozygosity in the gene pool for 200 years, in the case of the black rhino, there seems to be some "intuitive logic" in modifying this objective in terms of rhino generations; ten (10) rhino generations would represent 150-170 years.

At present growth rates *michaeli*, with a population of 68, should be expected to reach the carrying capacity of 75 in about four years. With a current population of *minor* at 28, it will obviously be some time before the SSP population can attain its carrying capacity of 75. The black rhino SSP is in the mature stage.

**Data Table: *D.b. michaeli* (current through 1 July, 1992)**

	Two Years ago	One Year ago	Current year
Participating Institutions	22	23	24
Captive Population	31.35	31.36	33.35
# SSP animals managed	66	67	68
# SSP animals not required to meet goals	0	0	0
# animals in non-participant collections but desirable to SSP	2	2	2
Total # of births in SSP program	5	1	3
# surviving to one year	4	1	3
# of SSP recommended births	5	1	3
# of non recommended births	0	0	0
# of deaths of SSP animals	2	1	2
# of imports	0	0	0
# of exports	0	0	0
# of founders w/ represented descendents	78	78	78

**Data Table: *D.b. minor* (current through 1 July, 1992)**

	Two Years ago	One Year ago	Current year
Participating Institutions	7	7	11
Captive Population	7.12	7.12	10.18
# SSP animals managed	19	19	28
# SSP animals not required to meet goals	0	0	0
# animals in non-participant collections but desirable to SSP	0	0	0
Total # of births in SSP program	1	1	1
# surviving to one year	1	0	1
# of SSP recommended births	1	1	1
# of non recommended births	0	0	0
# of deaths of SSP animals	0	1	1
# of imports	0	0	10
# of exports	0	0	0
# of founders w/ represented descendents	11	11	13

### Current Population Status

The population of *michaeli* is approaching the proposed MVP of 75 animals since it currently numbers 68 even though the population has only increased by one animal since 1991. The birth rate is minimal at best with only this increase represented by three births and two deaths in 1991. Since the black rhino population in the wild dropped 85% in only 30 years, from 60,000 in 1960 to under 3,000 today, more emphasis needs to be focused on captive breeding in order to increase the birth rate for both *michaeli* and *minor*. All black rhino in the population are SSP non-surplus animals and two *michaeli* in Mexico City have not been included in the North American population because they have not signed the Memorandum of Participation so are not managed as part of the SSP. In 1991, it was deemed that the MVP for *minor* needs to be increased. In regard to this goal, ten *minor* (4.6) were imported on 21 April 1992, seven founders and three calves assumed to be offspring of one of the imported founders. These animals were placed at four new holding institutions: Fossil Rim Wildlife Center, Santillana Ranch, El Coyote Ranch, all in Texas and at White Oak Plantation in Florida. Unfortunately, 1.1 died at Fossil Rim in June 1992. This acquisition was made possible through the International Black Rhino Foundation agreement with the Zimbabwean government. These animals were all wild-caught in Chete Wildlife Reserve.

### Demographic Trends

The Black Rhino SSP is attempting to manage two of the four potential evolutionarily significant units (esu's) for black rhino: *michaeli* and *minor*. Reproduction is occurring as explained above, but at a slower rate than is desirable. There have been no recommendations made to remove any animals from the breeding population. The Black Rhino Masterplan has been closely followed and almost every recommendation has been quickly accomplished. A new Masterplan will be completed by 1 September 1992 in order to place unpaired animals in breeding situations and also disperse younger animals to more holding institutions.

### Population Genetics

At the present time there are only 13 founders with represented descendents of *minor* in the North American population. There is an ongoing effort to increase founder representation. In Malaysia at Zoo Negara there still is an adult male *michaeli* that is available for import in exchange for a pair of white rhino, but the logistics of exchanging this animal are proving to be difficult. There is a 15 year old female *michaeli* at the Buenos Aires Zoo, Argentina that will be joining the SSP when it arrives in the U.S.

### Special Concerns

The population of *minor* continues to be increased and currently there is a dearth of space for *michaeli* which may have an eventual impact on space for *minor*. The Black Rhino SSP has been working with the White Rhino SSP in hopes of moving white rhino from selected institutions to open up more space for black rhino. The Black Rhino SSP may be forced to send some animals out of the U.S. in order to solve this problem. Presently there is a request from the Yokohama Zoo, Japan, for a young male black rhino from the San Diego Zoo. This male will probably be sent there under the prerequisite that the Yokohama Zoo participate in the SSP. The question of whether or not to keep *michaeli* and *minor* as two subspecies still begs an answer and genetic analyses are ongoing even though there are no apparent morphological differences. Also, biochemical analyses to date have not yet demonstrated any differences between *michaeli* and *minor*. There have been several thoughtful letters written by researchers to describe reasons to both merge these populations as well as keep them separate. Work is continuing on this issue. As the wild population continues to decline and space is at a premium, this problem needs to be more quickly resolved.

### Research

Current research involves reproduction studies such as hormonal evaluations of urines, bloods, saliva, feces; ultrasound evaluations for pregnancy, ovarian observations and anatomy; semen freezing; anatomical studies at necropsy; development of instrumentation for embryo transfer; nutritional studies involving vitamin E; disease related studies (not much change since 1991). There continues to be a need to increase the focus on nutritional studies and problems involving hemolytic anemia and ulcerative stomatitis that frequently occurs in this species.

## Field Conservation

The International Black Rhino Foundation agreement with the Zimbabwean government will help support field operations in Zimbabwe. Funds raised from the efforts of Michael Werhike as he walked across the U.S. will hopefully benefit many AAZPA institutions as well as black rhino in Africa.

## Progress Toward Goals

The top five specific goals for the black rhino program that are guiding the program are:

- (1) Propagate black rhino in North America to reinforce wild populations in Africa as part of the IUCN global strategy.
- (2) Toward this goal, attempt to preserve 90% of the average heterozygosity obtained from wild populations for a period of at least 170 years (ten black rhino generations) and perhaps longer.
- (3) Respect, at least initially, the four geographical varieties and potential esu's recognized by the 1986 Cincinnati African Rhino Workshop.
- (4) Develop an SSP population of 150 black rhino in North America (carrying capacity).
- (5) Expand the captive habitat for black rhino in North America and emphasize reproduction of black rhino in the management recommendations to insure the self-sustainment and expansion of the captive population against the appreciable mortality still occurring.

Progress toward the above stated goals has been described throughout this report.

## Short-term Goals for Upcoming Year

These goals are also the Long-Term Target Goals of Black Rhino Working Group (Meeting of this group convened in London on 1 July 1992 as part of the Rhino Global Captive Action Plan)

- (1) To increase the recruitment rate and carrying capacity of the captive population through: a) increasing the birth rate; b) enlarging the number of holding facilities; c) increasing the holding space at existing facilities.
- (2) Recommendations will be made to wean calves as soon as possible to be able to expose post-lactational cows to bulls.
- (3) Management of new *minor* founders will be carefully evaluated to enhance the entire populations.

## Five Year Goal

It will be extremely important to evaluate and determine, over the next five years, the nutritional requirements for captive black rhino as well as continue to provide resources to enhance study of reproduction and disease related problems.