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RHINOCEROS ADVISORY GROUP

Chair: Robert W. Recce, The Wilds

Primary goals

Considering the continuing crisis in rhino conservation, the primary goals of the AZA Rhinoceros Advisory Group (RAG) are as follows:

1. Develop viable *ex situ* populations as:
 - a. reservoirs of genetic and demographic material as potential reinforcement of populations in the wild;
 - b. subjects for research to improve conservation management *in situ* as well as *ex situ*; and,
 - c. ambassadors to stimulate public awareness and support, especially financial, for rhino conservation.
2. Toward achievement of Goal 1, improve captive husbandry and management through research in health, nutrition, behavior, and reproduction.
3. Facilitate and coordinate among the SSP programs for all rhino species (in collaboration with the species coordinators and the management groups).
4. Assist (financially, technically, and administratively) selected *in situ* efforts for rhinos, emphasizing those projects that are significant, feasible, and provide opportunities for the captive conservation community to apply expertise in intensive management technology.
5. Partnership with the International Rhino Foundation (IRF), particularly in pursuit of Goal 4.

Data table (current through 1 July 1998)

	Two Years Ago	One Year Ago	Current Year
Meetings each year	1	0	2
Studbooks under umbrella	4	4	4
SSPs under umbrella	4	4	4
New studbooks approved	4	0	0
New SSP petitions submitted	0	0	0
New SSPs approved	0	0	0

Progress toward goals

1. The AZA SSP Master Plan for Rhinos and Rhinoceros Regional Collection Plan were updated at a workshop conducted at White Oak Conservation Center in November 1997. The RCPs were published in January 1998.
2. Further implementation of the AZA Rhinoceros RCP has occurred as several new institutions have added rhinos, and others have converted species.
3. The eight major research projects that the RAG and IRF have been supporting have generated useful results. These projects comprise: one on health of black rhinos; one on nutrition of all rhinos; three on reproductive research on Sumatran rhinos; two on reproductive research on African rhinos but with extension to all rhinos; and one on improved health/husbandry databases and tissue sample collections. These projects are continuing. A major new research project on possible management factors causing the skew toward males in sex ratios of rhino calves born in the SSP has been initiated. The Research Council of the RAG is convening in July 1998 to review and revise the five-year research master plan first formulated in 1993. Based on the results of these research projects and the recommendations of the RAG Research Council, the IRF will issue a new Request for Proposals for funds later in 1998. The RAG has provided letters of support for other research projects applying for funding from sources other than IRF.
4. In an effort to correct for the skew toward males in sex ratio of calves in the black rhino, the RAG is facilitating an exchange of rhinos between the AZA SSP and the SSCJ in Japan. The SSP will receive a female and the SSCJ will obtain two males.
5. There has been significant progress on several components of the five-year plan's *in situ* programs, through a partnership with the IRF. Progress includes:
 - a. Operation of *in situ* managed breeding programs for Sumatran rhinos in Indonesia and Malaysia. Rhinos were moved from zoos in the United Kingdom and Indonesia to the Sumatran Rhino Sanctuary (SRS), Way Kambas National Park in January 1998, and attempts to breed them are in progress.
 - b. Rhino protection units (RPUs) for Sumatran rhinos and Javan rhinos in Indonesia and Malaysia continue their effective work.
 - c. An action plan has been formulated and is being implemented for Javan rhinos in Vietnam.

- d. Continued support for and consideration of new approaches for conservation of northern white rhinos in Garamba.
6. The RAG/IRF Program Office has continued to work closely with USFWS's Office of International Affairs on various projects involving implementation of the Rhinoceros and Tiger Conservation Fund (RTCF) including:
 - a. review of proposals submitted to USFWS for support under RTCF;
 - b. receipt of grants for several projects, administered by the IRF (RPU's and SRS); and,
 - c. attempts to persuade Congress to appropriate more funds for RTCF.
7. The Web site, established in conjunction with the IRF (at new address <http://www.rhinos-irf.org>), has continued to evolve and now has an operational listserv to facilitate communication among various rhino constituencies, including the RAG.
8. The RAG Program Office has continued to provide technical services for the AZA rhino master plans and to maintain the AZA Rhino Regional Studbooks as well as the International Studbook for Sumatran Rhinos.
9. The RAG has continued to facilitate interactions between the SSP and other regional captive breeding programs and the International Studbooks for African and Indian rhinoceros.

Special concerns

The conservation crisis for rhinoceros continues. There has been improvement on a number of fronts but continuing challenges on others.

In Africa, most of the news is good. The southern white rhinos have continued to increase and now are estimated at 8,400. Numbers of black rhinos have continued their recovery and numbers are now estimated at 2,600, a 13 percent increase over their low point of 2,300 earlier in the decade. Nevertheless, the poaching threat is still serious. The bad news is the situation for northern white rhinos remains precarious with only 25 rhinos surviving. Infrastructure and operations for protection in Garamba National Park are gradually recovering, but major changes in the program are occurring. A workshop to develop further plans and new mechanisms and partnerships for conservation of the northern white rhino will occur in August 1998. The RAG and IRF will continue to assist as need and funds permit.

In Asia, the Sumatran rhino, with fewer than 400 individuals, remains under intense poaching pressure although the rhino protection units (RPU's) formed with IRF and the IUCN/SSC Asian Rhino Specialist Group (AsRSG), seem to be ameliorating the situation. The American Association of Zoo Keepers (AAZK) is providing funds to help support the RPU's. The managed breeding programs for Sumatran rhinos at facilities in native habitat in Indonesia (Way Kambas National Park), Peninsula Malaysia (Sungai Dusun) and Sabah (Sepilok) continue.

Three rhinos (a male and two females) from zoos in the United Kingdom and Indonesia have returned to the managed breeding facility at Way Kambas. RPU's also are being established this year for Javan rhinos in Ujung Kulon, Indonesia. AZA institutions, with and through the IRF, assisted with an intensive census of Javan rhinos in Vietnam in early 1998. Results indicated only five to seven surviving. An action plan is in progress: the RAG and IRF will assist as funds and need permit. Poaching pressure on the third species of Asian rhino (~ 2,000) remains high and the possibility of a major decline remains real.

The AZA Rhinoceros Advisory Group also remains concerned with the successful implementation and management of sustainable *ex situ* populations, especially considering the critical state of wild populations. All of the Rhino SSP programs have deficiencies that are receiving attention. Major problems relate to husbandry, health, and reproduction of the animals as well as financial and physical resources. A demographic imperative also exists for both subspecies of white rhino in AZA institutions. To ameliorate the problem for the southern subspecies, plans are proceeding to acquire 15 to 25 new founders from South Africa, which is providing surplus removed from its national parks, and is receiving support from AZA institutions for *in situ* efforts in rhino conservation.

The Sumatran rhino continues as the greatest challenge in rhino conservation both *ex situ* and *in situ*. All three (1.2) surviving individuals in the SSP population (from a maximum of seven) have been consolidated at the Cincinnati Zoo. The major new reproductive research program initiated at the Cincinnati Zoo has produced some progress. The younger of the two females there has been pregnant three times in the last year, once for about three months, but she has failed to sustain the pregnancy for unknown reasons. Breeding efforts continue. Concurrently, efforts to develop managed breeding centers in native habitat in both Indonesia and Malaysia have progressed.

Financial report

Balance as of 1 July 1997	\$28.26
Funds raised*	\$100.00
Funds expended*	\$95.00
Balance as of 1 July 1998	\$33.26

* Much of the RAG's activities relative to *in situ* programs and research projects is in partnership with the IRF, which from September 1997 to September 1998 was providing and/or administering approximately \$750,000 for rhino conservation. As a consequence, the RAG has discontinued its separate fund.

Short-term goals for upcoming year

1. Continue with implementation of the AZA SSP Master Plan for Rhino.
2. Continue financial support of management-oriented research on rhinos, especially in conjunction with the IRF Research Program.
3. Continue to increase support, through IRF, of programs for *in situ* conservation of rhinos.
4. Facilitate additional exchanges of rhinos between SSP and other regional rhino breeding programs as well as managed populations in the wild.
5. Contribute to improvement of the SSP program for Sumatran rhinos.
6. Implement AZA-mandated changes in structure and function of taxon advisory groups.

BLACK RHINOCEROS SSP
(*Diceros bicornis*)

Species Coordinator: Don Farst, DVM, Gladys Porter Zoo
Regional Studbook Keeper: Thomas J. Foose, PhD, The Wilds and the International Rhino Foundation

Introduction

The AZA Black Rhino SSP continues its attempts to develop self-sustaining populations of two subspecies or geographical varieties of the species as a back-up to wild populations and as a resource to conduct management-oriented research and generate funds for *in situ* conservation. The seven-year/50-year/and 100-year target population objectives are: *michaeli* 90/90/90 and *minor* 50/80/80. The goal is to preserve 90 percent of the gene diversity in the population for 110 to 150 years (i.e. 8-10 rhino generations).

Data table *D. b. michaeli* (current through 1 July 1998)

	Two years ago	One year ago	Current year
Participating institutions	27	31	31
World captive population	Not available	87.98 (185)	Not available
North American captive population	39.30 (69)	42.31 (73)	42.31 (73)
SSP animals managed	39.30 (69)	41.31 (73)	42.31(73)
SSP recommended births	3	3.0	1.2 (3)
Nonrecommended births	0	0	0
Deaths of SSP animals	1	0.3 (3)	1.2 (3)
Imports	0	0.4 (4)	0
Exports	0	0	0
Founders with descendants	38	39	38

Data table *D. b. minor* (current through 1 July 1998)

	Two years ago	One year ago	Current year
Participating institutions	10	10	9
World captive population	Not available	29.32 (61)	Not available
North American captive population	13.18 (31)	18.20 (38)	18.17 (35)
SSP animals managed	13.18 (31)	18.20 (38)	18.17 (35)
SSP recommended births	5	5.2 (7)	0
Nonrecommended births	0	0	0
Deaths of SSP animals	2	0	0.3 (3)
Imports	0	0	0
Exports	0	0	0
Founders with descendants	22	27	23

Current population status

The SSP population of *minor* is now growing at a healthy pace although during the last year numbers and founders decreased slightly. However, this decline is considered a statistical vagary and the trend for this population is still good. The population should attain its desired size of 80 in less than a rhino generation. The *michaeli* population is larger and nearer to its target population size but has been more or less stagnant for a number of years. According to the International Studbook for African Rhinoceros, the global captive population of *michaeli* is approximately 185, and of *minor* 60, for a total of 245. Wild populations of black rhinos are gradually recovering in most range states although the threat of significant poaching remains throughout Africa. Current numbers are estimated at 2,600, or 300 above the low point of 2,300 earlier in this decade.

Demographic trends

Reproduction is adequate but not optimal in *D. b. michaeli*; despite the lack of births this year, reproduction is vigorous in *D. b. minor*. A major demographic problem continues to be high mortality due to a complex of health problems (including hemolytic anemia, liver toxicities, encephalomalacia, various infectious, and a recently described peripheral vasculitis syndrome). However, with various preventative and therapeutic measures suggested

by the continuing research on these problems, mortality has declined appreciably over the last several years. The greatest demographic problem in *michaeli* now is the serious skew toward males in sex ratio of calves born in the SSP: 21 of the last 28 surviving births have been male. The pattern is now statistically significant. A similar trend, although not yet statistically, may be developing in *minor*. In an effort to redress this demographic imbalance, three females were imported over the last year from the *michaeli* population in Addo Elephant National Park in South Africa. A further importation of a captive-born female from Japan is being arranged as part of an exchange between the SSP and Species Survival Committee of Japan (SSCJ), which will receive two males from the North American population.

Population genetics

The genetic foundation of the *michaeli* population seems adequate at this time: there are 38 founders; gene diversity is about .97. The addition of new founder lines with animals imported for demographic reasons will further secure this situation. The genetic status of *minor* in the North American population is also sound. There are 23 founders with another one a potential. Gene diversity is about 0.96. There was a loss of representation of four founders this last year with the death of sole descendants; there is the possibility of recovering representation of one of these founders from the Australasian population. There is an ongoing effort to increase founder representation through recruitment of reproduction from nonbreeder founders already in the population.

Special concerns

The possible causes of the skew toward males in the sex ratio of calves needs to be intensively investigated to determine if there are possible management factors causing this pattern. Health and husbandry need to be improved to increase survival and reproduction in this species. Additional space for both subspecies needs to be increased and coordinated with each other and with the two other major rhino taxa in SSP programs, the white and Indian rhino. The Black Rhino SSP has been working in particular with the White Rhino SSP in hopes of moving white rhinos from selected institutions to open up more space for black rhinos. Better coordination is the reason for combining the black and white rhinos first in the African Rhino SSP Master Plan of 1994 and now in the totally consolidated AZA Rhino Master Plan of 1996. The question of whether or not to keep *michaeli* and *minor* as two subspecies is still pending and the possibility of a workshop on the issue remains under consideration.

Research

There are several major research projects in progress involving health, husbandry, nutrition, and reproduction of black rhino, under auspices of the AZA Rhinoceros Advisory Group and with funding from the International Rhino Foundation.

Progress toward goals

1. The SSP master plan was updated in January 1998 as a result of a workshop for all Rhino SSPs conducted at White Oak Conservation Center in November 1997.
2. An appreciable number of rhinos continue to be relocated in an endeavor to induce more reproduction. There are already positive results from these moves and more relocations are planned.
3. To continue redress of the demographic imbalance caused by the skew toward males in sex ratio of *michaeli* calves born in the SSP, three females have been acquired from the free-ranging population in Addo Elephant National Park, South Africa to which this subspecies had been translocated in the 1960s from Kenya.
4. Major research projects on health, nutrition, and reproduction are in progress with support from the International Rhino Foundation.
5. Captive habitat for black rhinos in North America has been and continues to be expanded through coordination with the White Rhino SSP.

Field conservation

The SSP is working with the International Rhino Foundation (IRF) to provide support for selected *in situ* projects throughout Africa.

Financial report

The Black Rhino SSP does not maintain a separate bank account but works through the AZA Rhinoceros Advisory Group account and the International Rhino Foundation.

Short-term goals for upcoming year

1. Implementation will continue of the 1998 SSP Rhinoceros Master Plan recommendations for black rhino comprising:
Matings: *D. b. michaeli*--29 *D. b. minor*--18
Transfers: *D. b. michaeli*-16 *D. b. minor*--9
2. Attempts will continue to reproduce all breeding age females, and recommendations will continue to wean calves as soon as possible to be able to expose postlactational cows to bulls.
3. Research effort will continue to determine if there are management factors causing the skew toward males in the sex ratio of black rhino calves born in the SSP.
4. The SSP will continue to interact with other regional *ex situ* breeding programs as well as *in situ* protection and management efforts. In particular, an additional female *michaeli* will be imported from Japan (under auspices of the SSCJ) to redress the current imbalance in sex ration in this SSP population. In return, a male *michaeli* will be provided to the SSCJ population.
5. The SSP space will seek more space for both *michaeli* and *minor* in order to achieve the carrying capacity of 170 animals.

WHITE RHINOCEROS SSP
(*Ceratotherium simum*)

Species Coordinator: Michael Fouraker, Fort Worth Zoo
Regional Studbook Keeper: Tom Foose, PhD, The Wilds

Introduction

The White Rhino SSP is working to address the current demographic crisis facing the species. Immediate concerns for the White Rhino SSP continue to be the demographic status of the population, the need for additional founders and the need for adequate captive space and herd management.

Data table (current through 15 July 1998)

	Two years ago	One year ago	Current year
Participating institutions	42	39	39
Captive population	55.67 (122)	55.65 (120)	54.64 (118)
SSP animals managed	120	120	118
SSP recommended births/hatches	2.1 (3)	3.2 (95)	1.0 (1)
Nonrecommended births/hatches	0	0	0
Deaths of SSP animals	0.1 (1)	3.5 (8)	2.1 (3)
Imports	0	0	0
Exports	4	4	0
Founders with descendants	37	39	39

Demographic trends

The southern white rhino population is not self-sustaining and is in a demographic crisis. Only approximately 3 percent of the captive population is captive-born and -bred, numerous genetically valuable individuals have not reproduced, and the age structure is senescing (at least 55 percent of the population is older than 25).

As noted in the above data table, the managed population declined by three animals and there was only one birth within the population. A particular concern of the SSP is the recruitment of unproven individuals into the breeding population.

As reported for the last several years, the northern white rhino population consists of only four (2.2) animals (SD-WAP), none of which have reproduced. Furthermore, all are more than 20 years of age and thus may be postreproductive. One of these males on loan from Dvur Kralove is being returned this year to be housed with their 2.3 animals. This animal will be the only unrelated adult male for their females.

Population genetics

The genetic objective of the White Rhino SSP is to maintain 90 percent gene diversity for 110-150 years. This goal may be achievable if the current attempts at improved reproduction succeed. Additionally, the SSP is pursuing the importation of new founders over the next several years. As many as 5.15 animals may be involved.

The situation for the northern white rhino continues to look bleak. Without reproduction and with such a low number of founders, this population is not likely to be genetically viable without the global management of both captive and remnant wild animals.

Special concerns

1. **Demographic crisis:** The major problem facing the White Rhino SSP that requires immediate attention is the demographic status of the population. Reproduction to date has been sporadic across institutions, and only a few institutions have produced calves consistently. As noted previously, unproven breeders must be recruited into the breeding population in order to meet the population's genetic goals. The number of requests from institutions for animals exceeds the number of individuals available within the SSP population.
2. **Continued need for large enclosures and social groups:** Large captive spaces must be identified that can hold white rhinos in herd situations to encourage reproduction. There are a total of 86 adult spaces and 35 calf spaces in 13 facilities (current and proposed).

Research

1. Understanding basic reproductive biology to conserve the African rhinoceros (T. Roth, principal investigator, Center for the Reproduction of Endangered Wildlife)
To date, nine White Rhino SSP institutions are participating in an International Rhino Foundation (IRF)-funded project examining the basic reproductive biology of the African rhino. This project was initiated in 1997, and recently received additional funds to cover expenses and expand research directions. The project encompasses four studies with the following specific objectives:
 - a. to establish the reproductive status of the extant population by measuring reproductive cycle patterns via hormonal profiles and relating these data to reproductive behavior, seasonality and stress;
 - b. to determine the feasibility of noninvasively estimating time of ovulation;
 - c. to examine the impact of seasonality on male reproductive hormones;
 - d. to begin developing and testing the feasibility of transcervical artificial insemination; and
 - e. to set the stage for the development of a rhino genome resource bank.Data collection included the collection of feces (to monitor hormonal patterns) and behavioral data (to identify behaviors that may correlate to estrus; coordinated by T. Wagener, Fort Worth). Results will be presented to the IRF and Rhino TAG this year.
2. IRF and Zoological Society of San Diego are hosting a workshop on problems associated with the low rate of reproduction among captive-born female southern white rhinos. Few captive-born females of reproductive age have ever reproduced. The majority of these rhinos monitored by hormones have been found to be either acyclic or to demonstrate irregular cycles. Topics will include extended luteal phases, ovulation induction and behavior. The White Rhino SSP will support and participate in this important project.

Progress toward goals

1. Compliance with SSP master plan recommendations is good. Twenty rhinos have been transferred in the past two years.
2. Significant research projects have been funded which should set the stage for increasing the population growth rate and recruiting additional founders into the population.

Financial report

There is not a dedicated fund for the White Rhino SSP. White Rhino SSP research and conservation projects are supported both logistically and financially by the Rhino TAG and IRF.

Short-term goals for upcoming year

1. Import 12 southern white rhinos from South Africa.
2. Improve conditions to stimulate reproduction in those institutions holding the individuals that are not breeding.
3. Designate most females older than 25 (with a very few exceptions) as surplus. It is recognized that many of these animals may be lost as potential breeders and that efforts may be better expended on acquiring new founders from South Africa for genetic and demographic reasons.
4. Do not move females older than 21 years of age in an attempt to induce breeding. Rather, there should be attempts at inducing reproduction by hormonal treatment.
5. Attempt to avoid the "sibling relationship" syndrome that seems to occur when young white rhinos, especially pairs, are placed together from an early age.
6. Continue the intensive reproductive assessment and management, including the hormonal manipulation of the four northern white rhinos.
7. Increase cooperation with Dvur Kralove to maximize the possibility of successful reproduction with the northern white subspecies.
8. Continue to facilitate and encourage the compliance with all master plan recommendations.
9. Support and conduct research leading to increasing the population growth rate and recruiting additional founders.