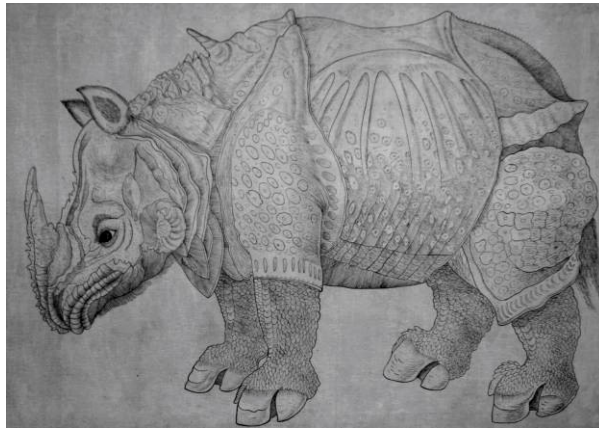


# Rhinoceros Taxon Advisory Group Regional Collection Plan Third Edition June 2021



**ASSOCIATION  
OF ZOOS &  
AQUARIUMS**



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## Introduction

This is the Association of Zoos and Aquariums' Rhinoceros Taxon Advisory Group's third edition of the Regional Collection Plan for Rhinoceros and is considered the cooperative management plan for all three of the species managed in the AZA. Cooperative management involving other entities outside the AZA is taken into consideration following the guidelines of AZA's sustainability partner policies.

Three of the five extant species of the family *Rhinocerotidae* including Eastern black rhino, Southern white rhino, and Greater one-horned (GOH) rhino, are currently managed in AZA member institutions. The southcentral (formerly southern) black rhino is also housed in some AZA facilities, but is not managed through the AZA. Currently, there is no *ex-situ*/captive program for the Javan rhino and they are managed solely in their native range. The Sumatran rhino is managed in their native range, but includes the breeding program at the Sumatran Rhino Sanctuary in Way Kambas. Sumatra, Indonesia.

The Rhinoceros Taxon Advisory Group and rhino Species Survival Plans are organized to integrate management across species. The intention is to share managed resources between rhinoceros programs and, where possible, to shift space resources between species to more effectively meet AZA rhino program population goals. Historically, rhino management was similar across the species, but with improved nutrition, more research, improved exhibit design, and a greater understanding of the different needs of those species, that is no longer the case. Each species has different management needs and represent different experiences for visitors at AZA facilities. The conservation challenges for all the rhinos are similar and the managed program of each species in AZA contributes to the solutions and efforts of all five species.

## Mission

To provide leadership and coordination to AZA institutions for rhino conservation and management programs *in situ* and/or *ex situ*.

## Objectives of the Rhino Taxon Advisory Group

1. Develop and maintain viable *ex situ* rhinoceros populations of eastern black rhino, southern white rhino, and greater one horned rhinos as:

- A. Reservoirs of genetic and demographic material for potential reinforcement of *in situ* populations as the need and opportunity occur;
  - B. Research candidates to improve conservation management *ex situ* as well as *in situ*;
  - C. Exhibit animals for zoos to educate the public about their plights and to be ambassadors to stimulate public awareness and support, especially financial, for rhino conservation.
2. Evaluate and make recommendations for *ex situ* rhino husbandry and management through research in health, welfare, nutrition, behavior, reproduction and genetics/demography to facilitate development of viable rhino populations *ex situ* and to transfer results as appropriate to intensively managed rhino populations *in situ*.
  3. Strategic coordination of space and resources for rhinos in AZA institutions. Utilize the spaces for the greatest impact on the conservation of the three species in captivity in the AZA
  4. Provision and recruitment of financial, technical, and administrative assistance for selected *in situ* efforts for rhino. Emphasize those projects that are significant, feasible, and provide appropriate opportunities for application of particular expertise that the *ex situ* conservation community can provide in terms of intensive management technology. Work in partnership with the International Rhino Foundation (IRF) and other NGOs (e.g. International Rhino Keepers Association (IRKA), American Association of Zookeepers (AAZK), Bowling for Rhinos, World Wildlife Fund (WWF), and the International Union for the Conservation of Nature (IUCN).

## **Rhino Taxon Advisory Group Organizational Structure**

The taxa within the purview of the Rhino TAG addressed in this RCP are the eastern black rhino, southern white rhino, and greater-one-horned rhino. All three species have similar space requirements with differences in needs and space complexity. The Rhino TAG recognizes the focal role of the SSP coordinators in maintaining consistency and continuity in these species' management programs. The primary goal of this structure is to incorporate the experience and expertise of the steering committee members and the Rhino Research Council (the group that collaborates with the TAG to provide professional resources as outlined on pages 5-6) to ensure optimal welfare and the sustainability of all species of rhino in captivity. The TAG involves Institutional Representatives in the conservation management programs for all rhino taxa held in AZA institutions and to be a source for the conservation of the Sumatran rhino *in situ*.

The rhino SSPs are consolidated into a single comprehensive program (TAG/SSPs). All SSP Coordinators are program managers of their respective species, and are designated voting members of the rhino TAG Steering Committee (SC). The regional studbook keepers are also voting members of the SC. The Institutional Representatives (IRs) consist of one individual representing each AZA institution that holds rhinos, or that is interested in holding rhinos. The IRs can apply to be on the steering committee and through democratic processes are voted on for three-year terms. All SSP Coordinators/studbook keepers and TAG leadership are subject to periodic review and a 'vote of confidence' as outlined in established Animal Program Management Committee (APM Committee) guidelines. The TAG maintains responsibility for all duties previously ascribed to both TAGs and SSPs such as studbooks, masterplanning, identification of research needs, and interaction with *in situ* conservation programs. The TAG also works very closely with the Rhino Research Council (RRC) in the disciplines of Health, Nutrition, Genetics, Behavior/Ecology, Reproduction and Management. The advisors may appoint additional co-advisors for specific taxa/disciplines as necessary. The TAG and RRC chairs collaborate closely.

**AZA Rhinoceros Taxon Advisory Group  
Steering Committee and Advisors  
Current May 2021**

Rhino TAG Steering Committee – Appointed members

Adam Eyres, TAG Chair, White Rhino SSP Coordinator, Fossil Rim Wildlife Center  
Steve Metzler, TAG Vice-Chair, San Diego Zoo Safari Park  
Lisa Smith, Secretary, Eastern Black Rhino SSP Species Coordinator, Buffalo Zoo  
Vacant, Greater One Horned Rhino SSP Coordinator  
Jonnie Capiro, Southern White Rhino Regional Studbook Keeper, SDZ Safari Park  
Gina Ferrie, Eastern Black Rhino Studbook Keeper, Disney's Animal Kingdom®  
Joe Hauser, Greater One Horned Rhino Regional Studbook Keeper, Buffalo Zoo  
Terri Roth, Rhino Research Council, Cincinnati Zoo and Botanical Garden/CREW

Rhino TAG Steering Committee – Elected IRs

2017-2022 (4 yr. terms)

Dan Beetem	The Wilds
Scotty Wade	White Oak
Adam Felts	Columbus Zoo

2017-2021 (3 yr. terms)

Amy Roberts	Brookfield Zoo
Matt James	Dallas Zoo
Chris Massaro	Zoo Tampa at Lowry Park
Ashleigh Kandrac	Lion Country Safari

Advisors (Rhino Research Council)

Eric Miller, Health Advisor, Retired--St. Louis Zoo, MO

Michele Miller, Health Advisor, Stellenbosch University, South Africa  
 Lara Metrione, Behavioral Advisor, SEZARC, FL  
 Monica Stoops, Assisted Reproduction Advisor, Henry Doorly Zoo, NE  
 Vacant, Genetics Advisor  
 Katie Sullivan, Nutrition Advisor, Disney's Animal Kingdom®, FL  
 Nina Fascione, Executive Director, International Rhino Foundation, VA  
 Lance Aubery, Keeper Liaison/International Rhino Keeper Association, CA  
 Jamie Ivy, Small Population Management Advisor/PMC, San Diego Zoo Wildlife Alliance, CA  
 Adam Eyres, Management, Fossil Rim Wildlife Center, TX

## TAG Leadership Contact Information

### AZA Rhino Advisory Group Leadership - Contact Information

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Joe	Hauser	GOH Rhino Studbook.	716 837 3900 x247	jhauser@buffalozoo.org
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Nina	Fascione	IRF Exec. Director		nfascione@rhinos.org

## TAG Definition

The purview of the Rhino Taxon Advisory Group is the five extant species in the family *Rhinocerotidae* (Table 1). Further, it has been determined that for the purposes of this document, and all future documents generated by the AZA Rhino Taxon Advisory Group, the terms Rhinoceros and Rhino will be used interchangeably. This RCP focuses on the *ex situ* population in AZA facilities.

**Table 1. Rhino TAG Definition**

<b>Common name</b>	<b>Scientific name</b>
<b>Black Rhino</b> Southwestern black rhino Northwestern black rhino Eastern black rhino Southcentral black rhino	<i>Diceros bicornis bicornis</i> <i>Diceros bicornis longipes</i> <i>Diceros bicornis michaeli</i> <i>Diceros bicornis minor</i>
<b>White Rhino</b> Northern white rhino Southern white rhino	<i>Ceratotherium simum cottoni</i> <i>Ceratotherium simum simum</i>
<b>Greater One-horned Rhino</b>	<i>Rhinoceros unicornis</i>
<b>Javan Rhino</b> Indonesian Javan rhino Vietnamese Javan rhino	<i>Rhinoceros sondaicus sondaicus</i> <i>Rhinoceros sondaicus abbanutucys</i>
<b>Sumatran Rhino*</b> Eastern Sumatran rhino (Borneo)  Western Sumatran rhino (Sumatra, Malaya)	<i>Dicerorhinus sumatrensis harrissoni</i> <i>Dicerorhinus sumatrensis sumatrensis</i>

\*Studies to determine sub specific differences between the Eastern (Bornean) and Western (Sumatran, Malaya) populations of *D. sumatrensis*. have concluded with somewhat mixed results. The consensus is that there are distinct genetic differences that support keeping sub-species separate, but the situation is too dire and the ability to manage the populations as one meta-population is more critical than the genetic considerations.

### **Conservation Program Status**

The conservation status of each rhino species was determined by consulting the 2021 IUCN Red Data List, current USFWS listings and CITES Appendices. Wild population status was gathered from the most recent IUCN/SSC African Rhino Specialist Group and Asian Rhino Specialist Group information (see Table 2). The *ex situ* population status for each species was determined by reviewing regional studbook data (Table 3). A summary of the current TAG program status including program leaders and publication dates is provided in Table 4.

**Table 2: Conservation Status of Wild Rhinos**

\*Source: IUCN/SSC African and Asian Rhino Specialist Group

<b>Taxon</b>	<b>IUCN Red List Status</b>	<b>CITES Status</b>	<b>USFWS Status</b>	<b>Wild Population Estimates (IUCN SSC 2020)</b>
<b>Black Rhino</b>		Appendix I	Endangered	~5,630 (total among all subspecies)
Southwestern Black Rhino	Vulnerable			~3,822
Northwestern Black Rhino	Extinct			0
Eastern Black Rhino	Critically End.			~583
Southcentral Black Rhino	Critically End.			~1,225
<b>White Rhino</b>				~18,002
Northern White Rhino	Functionally Extinct	Appendix I	Endangered	2
Southern White Rhino	Near Threatened	Appendix II	Threatened due to the similarity of appearance	~18,000
<b>GOH Rhino</b>	Vulnerable (2020)	Appendix I	Threatened	~3,600
<b>Javan Rhino</b>				74 total
Indonesian Javan Rhino	Critically Endangered	Appendix I (all subspecies)	Endangered (all subspecies)	~18 mature rhinos
Vietnamese Javan Rhino	(all subspecies)			0
<b>Sumatran Rhino</b>				~80 total
Eastern (Borneo) Sumatran Rhino	Critically Endangered (all subspecies)	Appendix I (all subspecies)	Endangered (all subspecies)	~30 mature rhinos
Western (Sumatra/Malaya) Sumatran Rhino				



**Table 3: Status of Rhinos in Captivity**

<b>Taxon</b>	<b>North American Population</b>	<b>International Population</b>
<b>Black Rhino</b>	<b>81</b>	<b>~215</b>
Eastern Black Rhino	55	~175
Southern Black Rhino	26	~40
<b>White Rhino</b>	<b>286</b>	<b>~780</b>
Southern White Rhino	286	~780
<b>GOH Rhino</b>	<b>78</b>	<b>~215</b> (international studbook 2017)

**Table 4: TAG Program Stats**

<b>Program</b>	<b>Date Program Initiated</b>	<b>Current Program Leader</b>	<b>Date Leadership Assumed</b>	<b>Date of last studbook update</b>	<b>Date of last master plan publication</b>
<b>Eastern Black Rhino SSP</b>	1981	Lisa Smith Buffalo Zoo	3/2015	1/2020	2/2018 Draft version in 2021
<b>Southern White Rhino SSP</b>	1982	Adam Eyres Fossil Rim Wildlife Center	11/2007	N/A	June 2021
<b>Greater one-horned Rhino SSP</b>	1981	Vacant	Applications being accepted in May 2021	N/A	5/2019 Draft version for 2021 in print now
<b>Eastern Black Rhino Studbook</b>	1995	Gina Ferrie Disney's Animal Kingdom®	6/2014	1/2020	N/A
<b>Southern White Rhino Studbook</b>	1981	Jonnie Capiro San Diego Safari Park	2/2016	3/2019	N/A
<b>Greater one-horned Rhino Studbook</b>	1995	Joe Hauser Buffalo Zoo	12/2018	11/2013	N/A

## Species Evaluation Process

Based on the following considerations the Rhino Taxon Advisory Group conducted an evaluation exercise similar to the 2015 RCP, with minor modifications based on the APM committee feedback pertaining to the reimagining of the SSP program. Each member of the TAG Steering Committee evaluated each rhinoceros species utilizing the species assessment criteria and management assessment process. Rhino program recommendations were based on the following information:

- The family Rhinocerotidae consists of five extant species distributed among four genera. This small number of taxa allows current AZA conservation programs to adequately cover each of the four genera.
- The facilities for display, propagation, and maintenance of rhinos in captivity are unique. As a result, there is little or no competition for existing “rhino space” from other species.
- Well-established AZA SSPs exist for all three *ex situ* rhino species. The APM Committee recognizes that GOHR, eastern black rhino, and southern white rhinos will remain in AZA facilities and are unlikely to change their SSP status based on the new criteria defining an SSP.

Each rhino SSP was evaluated by the Rhino TAG, including the population biologists, steering committee and advisors based on the data from the most recent studbooks for each species to evaluate each program and set target population numbers. The results of each rhino program analysis have been included with the species evaluations. The following recommendations and rationale were employed for assigning each species to an appropriate management category.

### Rhino Program Assessment Tool

Availability within AZA – dynamic managed population	Low/Med/High
Availability outside AZA – dynamic population	Low/Med/High
Extinction Risk without Management (in Zoos & Aquariums) - intervention	Low/Med/High
Extinction Risk with Management (in Zoos & Aquariums) - established program	Increase/Decrease/Unchanged
Demand within AZA – holders seeking animals	Low/Med/High
Institutional Commitment – holders, interest, support	Low/Med/High
Ease of Breeding – established management	Easy/Med/Difficult

Extinction Risk (Wild)	Degree of threat
Acquisition Cost (Outside AZA) - acquisition	Low/Med/High
Program Operating Costs – cost to maintain in zoos	Low/Med/High
International Program – conservation program link	Yes/No
Link to Conservation of Wild Population	Yes
North American Governmental Conservation Program	No
Program Designation	SSP Level/Phase Out/No Mgmt.

**Table 5. AZA Animal Management Program Categories, 2020**

Green	Yellow	Red
<p>Green SSP® Programs are Currently Sustainable for the long-term.</p> <ul style="list-style-type: none"> <li>The population is presently sustainable demographically for 100+ years or 10+ generations.</li> <li>The population can retain a high amount of gene diversity (&gt;90% GD) over this time.</li> <li>The Program is subject to SSP® Full Participation and the non-AZA member application processes.</li> </ul> <p>These programs are called Species Survival Plans®</p>	<p>Yellow SSP® Programs are Potentially Sustainable for the long-term.</p> <ul style="list-style-type: none"> <li>The population currently cannot retain 90% gene diversity for 100 years or 10 generations.</li> <li>The population requires additional attention and effort to make it more sustainable.</li> <li>Factors affecting sustainability that need to be addressed may include: <ul style="list-style-type: none"> <li>Lack of husbandry and breeding expertise/predictability;</li> <li>Too few individuals;</li> <li>Too little space;</li> <li>Low gene diversity; and</li> <li>Poor demographics</li> </ul> </li> <li>The Program’s adherence to SSP® Full Participation is voluntary, and Programs can partner with non-AZA members without going through the AZA non-member application process.</li> </ul> <p>These programs are called Species Survival Plans®</p>	<p>Red Programs are Currently Not Sustainable for the long-term and the populations are deemed critical.</p> <ul style="list-style-type: none"> <li>The population has fewer than 50 individuals and is not designated as an SSP® Program based on collection sustainability criteria.</li> <li>The Program should be managed as an official AZA Studbook if the TAG recommends these species in the RCP but will not require formal planning on a regularly scheduled basis.</li> <li>Red designation may serve as a strong call to action.</li> <li>The Program’s adherence to SSP® Full Participation is voluntary, and Programs can partner with non-AZA members without going through the AZA non-member application process.</li> </ul> <p>These programs are called Studbooks or Red Programs</p>

## Black Rhinoceros *Diceros bicornis*

- A viable North American *ex situ* program exists for Eastern (*D.b. michaeli*) black rhinoceros.
- A captive program does exist for the southern black rhino (*D.b. minor*) and is cooperatively managed by the International Rhino Foundation (IRF) and the Conservation Centers for Species Survival (C2S2).
- Current programs play a role in *in situ* conservation of the species.

- Reintroduction programs are currently under development in collaboration with EAZA.
- There is a long history of scientific and research activities related to the species.
- Husbandry for the species is established and active efforts are in progress for improvement.
- High profile nature of the species presents high levels of exhibit and education value.
- Only species within its genera; there are four distinct subspecies recognized by IUCN/SSC African Rhino Specialist Group; the SSP is working with one of the four subspecies (Eastern) and is currently managing them as a distinct subpopulation.

### Conservation Program Strategy

- Support black rhino conservation efforts and initiatives in Africa through the AZA Black Rhino SAFE Program.
- Support black rhino conservation efforts in east Africa with partner NGOs (eg. IRF, Bowling for Rhinos, IRKA, Grumeti Fund, EAZA).
- Smaller white rhino facilities may want to consider working with black rhinos which need more space to grow the population towards its target size.
- Additional holders are needed for breeding, non-breeding and/or single sex groups.

### Eastern Black Rhinoceros *Diceros bicornis michaeli*

#### Recommended program status: **SSP Yellow Program**

The current SSP population of eastern black rhinoceros is 56 animals (29 males, 26 females, 1 unknown sex) held by 25 AZA facilities. Under AZA’s current sustainability designations, this Program currently qualifies as a Yellow SSP. Genetic and demographic analyses of the AZA Studbook for Black Rhinoceros (current to 15 March 2021) were performed using ZIMS for Studbooks and PMx 1.6.2.20190628, resulting in the current summary statistics.

#### Demography

Current Population Size (males.females.unknowns)	55 (29.25.1)
# Animals Excluded From Management	3 (2.1.0)
Population Size Following Exclusions	52 (27.24.1)
Target Population Size	77
Mean Generation Time (T; in years)	15.7
Projected Population Growth Rate ( $\lambda$ ) – from life tables	0.955 <> 0.978 <> 0.998
Historic Population Growth Rate (average $\lambda$ 1960-2020)	0.984
Recent Population Growth Rate (average $\lambda$ 2016-2020)	1.004

#### Genetics

	2021	Current Potential
Number of Founders	37	0 additional
Founder Genome Equivalents (FGE)	11.11	16.34

Gene Diversity Retained (GD %)	95.50	96.94
Population Mean Kinship (MK)	0.0450	-----
Mean Inbreeding (F)	0.0022	-----
% Known Pedigree Before / After Assumptions and Exclusions	100 / 100	-----
% Certain Pedigree Before / After Assumptions and Exclusions	100 / 100	-----
Effective Population Size / Census Size Ratio (Ne / N)	0.4487*	-----
<b>Projections</b>		
Years To 90% Gene Diversity	49 <sup>a</sup>	-----
Years To 10% Loss of GD	95 <sup>a</sup>	-----
Gene Diversity at 100 Years From Present (%)	85.6 <sup>a</sup>	-----

\*Ne/N includes founders in calculation.

<sup>a</sup>projections based on the current population (recent growth rate  $\lambda = 1.004$ , T = 15.7 years, target size = 77 animals)

Demographic analyses in the 2021 Breeding and Transfer Plan suggest that to grow to the target population size at a rate comparable to the last five years ( $\lambda = 1.004$ ) would take 85 years and require approximately five births per year. Births in the last five years, however, while consistent, have ranged from 1-3 each year; therefore, this goal may be ambitious for this population at this time. Every effort should be made to produce four or more calves each year to continue the positive growth that has been seen in recent years. Gene diversity in the analytical population is 95.5% and is projected to decline to ~85.6% over the next 100 years if the population grows by 0.4% per year to a target size of 77 animals.

### Eastern Black Rhino

CRITERIA	
Availability within AZA	Medium
Availability outside AZA	Low
Extinction Risk without Management (in Zoos & Aquariums)	High/Endangered
Extinction Risk with Management (in Zoos & Aquariums)	Decreases
Demand within AZA	Medium
Institutional Commitment	High
Ease of Breeding	Medium
Extinction Risk (Wild)	Critically Endangered
Acquisition Cost (Outside AZA)	High
Program Operating Costs	High
International Program	Yes
Link to Conservation of Wild Population	Yes
North American Governmental Conservation Program	No
Program Designation:	<b>Yellow SSP</b>

## White Rhinoceros *Ceratotherium simum*

- A viable North American captive program exists for the southern subspecies.
- Additional potential founders are not necessary at this point but available for the southern subspecies.
- Current programs play a role in *in situ* conservation of the species.
- There is a long history of scientific and research activities related to the species.
- Husbandry for the species is established and active efforts are in progress for improvement.
- High profile nature of species presents high levels of exhibit and education value.
- Only species within its genera; there are two distinct subspecies recognized by the IUCN/SSC African Rhino Specialist Group; the SSP program is for the southern subspecies; founders not available for northern subspecies and the wild population is believed to be extinct. The San Diego Zoo Wildlife Alliance has a strong program dedicated to research using the “Frozen Zoo” © to bring back the northern white rhino and the research will simultaneously advance southern white rhino assisted reproductive techniques (ART).

### Conservation Program Strategy

- Support rhino conservation efforts in Africa with partner NGOs (eg. IUCN AfRSG, IRF, Bowling for Rhinos, IRKA, EAZA).
- Prioritize breeding recommendations with holders and facilities that manage large groups with natural social dynamics.
- Facilities holding single animals or pairs may want to consider holding black rhinos which need greater capacity.
- Additional holders are needed for non-breeding, and/or single sexed groups.

## Southern White Rhinoceros *Ceratotherium simum simum* Recommended Program Status: SSP Green Program

The current SSP population of southern white rhinoceros is 286 animals (102 males, 184 females) held by 50 AZA facilities and one Sustainability Partner. Under AZA’s current sustainability designations, this Program currently qualifies as a Green SSP (>90% gene diversity for 100 years). Genetic and demographic analyses of the AZA Studbook for Southern White Rhinoceros (current to 22 February 2021) were performed using ZIMS for Studbooks 3.0 and PMx 1.6.2.20200804, resulting in the current summary statistics.

### Demography

Current Population Size (males.females.unknowns)	286 (102.184.0)
# Animals Excluded From Management	26 (6.20.0)
Population Size Following Exclusions	260 (96.164.0)
Target Population Size	300
Mean Generation Time (T; in years)	18.2

Projected Population Growth Rate ( $\lambda$ ) – from life tables	1.02
Historic Population Growth Rate (average $\lambda$ 1924-2020)	1.09
Recent Population Growth Rate (average $\lambda$ 2016-2020)	1.05

### Genetics

	2021	Current Potential
Number of Founders	68	40 additional
Founder Genome Equivalents (FGE)	23.80	97.04
Gene Diversity Retained (GD %)	97.90	99.48
Population Mean Kinship (MK)	0.0210	-----
Mean Inbreeding (F)	0.0013	-----
% Known Pedigree Before / After Assumptions and Exclusions	99.5 / 100	-----
% Certain Pedigree Before / After Assumptions and Exclusions	99.1 / 99.6	-----
Effective Population Size / Census Size Ratio (Ne / N)	0.26	-----
<b>Projections</b>		
Years To 90% Gene Diversity	238 <sup>a</sup>	-----
Years To 10% Loss of GD	305 <sup>a</sup>	-----
Gene Diversity at 100 Years From Present (%)	94.5 <sup>a</sup>	-----

<sup>a</sup>projections based on the current analytical population ( $\lambda = 1.02$ ,  $T = 181.2$  years, target size = 300 animals)

Demographic analyses in the 2021 Breeding and Transfer Plan suggest that current reproduction is sufficient to both maintain the population's current size and slowly grow the population as space allows. From 2016-2020, the population averaged ~15 births per year; only ~20 births are needed over the next two years (10 births per year) to maintain the current population size of 286 rhinos while ~36 births are needed (18 births per year) to grow the population to a size of 300 rhinos ( $\lambda = 1.02$ ). Gene diversity in the analytical population is 97.90%, which is well above the 90% threshold commonly thought to represent genetic vigor. Gene diversity is projected to decline to ~94.5% over the next 100 years if the current analytical population grows by 2% per year to a target size of 300 animals.



### Southern White Rhino

CRITERIA	
Availability within AZA	High
Availability outside AZA	Medium
Extinction Risk without Management (in Zoos & Aquariums)	Med/Vulnerable
Extinction Risk with Management (in Zoos & Aquariums)	Decreases
Demand within AZA	High
Institutional Commitment	High
Ease of Breeding	Medium
Extinction Risk (Wild)	Vulnerable
Acquisition Cost (Outside AZA)	High
Program Operating Costs	High
International Program	Yes
Link to Conservation of Wild Population	Yes
North American Governmental Conservation Program	No
Program Designation	<b>Green SSP</b>

### Greater One-horned Rhinoceros, Indian Rhinoceros *Rhinoceros unicornis*

- A viable North American captive program exists.
- Additional potential founders may be available.
- Current programs play a significant role in *in situ* conservation of the species.
- Reintroduction programs are unnecessary at this time, but the Indian Rhino Vision 2020 was a strong link to *in situ* conservation and they are working on the next iteration of that project. AZA GOHR facilities should stay connected to that.



- There is a long history of scientific and research activities related to the species.
- Husbandry for the species is established and active efforts are in progress for improvement.
- High profile nature of species presents high levels of exhibit and education value.
- One of two species within its genera; investigations are underway to determine if there are sub-specific differences within the species.

### Conservation Program Strategy

- Support Greater one-horned rhino conservation efforts in India and Nepal with partner NGOs (eg. IRF, Bowling for Rhinos, IRKA, WWF IRV2020).
- Prioritize breeding recommendations with established holders and facilities.
- Additional holders are needed for non-breeding, and/or single sexed groups.

**Greater One-horned Rhinoceros**      *Rhinoceros unicornis*  
**Recommended Program Status:**      **SSP Yellow Program**

The current SSP population of greater one-horned (GOH) rhinoceros is 78 animals (35 males, 43 females) distributed among 19 AZA facilities and one Sustainability Partner. Under AZA’s current sustainability designations, this Program currently qualifies as a Yellow SSP (≥50 animals; <90% gene diversity for 100 years). Genetic and demographic analyses of the AZA Studbook for Greater One-Horned Rhinoceros (current to 22 February 2021) were performed using ZIMS for Studbooks 3.0 and PMx 1.6.2.20200804, resulting in the current summary statistics.

### Demography

Current Population Size (males.females.unknowns)	78 (35.43.0)
# Animals Excluded From Management	5 (2.3.0)
Population Size Following Exclusions	73 (33.40.0)
Target Population Size	85
Mean Generation Time (T; in years)	15.3
Projected Population Growth Rate ( $\lambda$ ) – from life tables	1.04
Historic Population Growth Rate (average $\lambda$ 1924-2020)	1.046
Recent Population Growth Rate (average $\lambda$ 2016-2020)	1.04

### Genetics

	2021	Current Potential
Number of Founders	25	0 additional
Founder Genome Equivalents (FGE)	9.35	13.71
Gene Diversity Retained (GD %)	94.65	96.35
Population Mean Kinship (MK)	0.0535	-----
Mean Inbreeding (F)	0.0167	-----
% Known Pedigree Before / After Assumptions and Exclusions	100/100	-----
% Certain Pedigree Before / After Assumptions and Exclusions	100/100	-----
Effective Population Size / Census Size Ratio (Ne / N)	0.35	-----

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<b>Projections</b>		
Years To 90% Gene Diversity	45 <sup>a</sup>	-----
Years To 10% Loss of GD	100 <sup>a</sup>	-----
Gene Diversity at 100 Years From Present (%)	84.7 <sup>a</sup>	-----

<sup>a</sup>projections based on the current analytical population ( $\lambda = 1.04$ ,  $T = 15.3$  years, target size = 85 animals)

Demographic analyses in the 2021 Breeding and Transfer Plan suggest that current reproduction is sufficient for maintaining the current population size, but may need to be minimally increased to confidently grow the population. From 2016-2020, the population averaged ~6 births per year; only ~4 births per year are projected to be needed to maintain the population at its current size while ~8 births per year are needed to grow the population to a target size of 85 animals in the next two years ( $\lambda = 1.04$ ). Gene diversity in the analytical population is 94.65%, which is above the 90% threshold commonly thought to represent genetic vigor. Gene diversity is projected to decline to just under 85% over the next 100 years if the current analytical population grows by 4% per year to a target size of 85 animals.

### Greater One-horned Rhino

CRITERIA	
Availability within AZA	Medium
Availability outside AZA	Low
Extinction Risk without Management (in Zoos & Aquariums)	Med./Threatened
Extinction Risk with Management (in Zoos & Aquariums)	Decreases
Demand within AZA	Medium
Institutional Commitment	High
Ease of Breeding	Medium
Extinction Risk (Wild)	Threatened
Acquisition Cost (Outside AZA)	High
Program Operating Costs	High
International Program	Yes
Link to Conservation of Wild Population	Yes
North American Governmental Conservation Program	No
Program Designation	<b>Yellow SSP</b>

## Sumatran Rhinoceros

### *Dicerorhinus sumatrensis*

- A North American captive population no longer exists. However, when it did, reproductive research led to a major breakthrough in reproducing this species successfully within a managed breeding program which now serves as a template for Indonesian managed propagation programs vital to the survival of the species. There is an international studbook maintained for the Sumatran rhino.
- Zoos and zoo support play a significant role in *in situ* conservation of this species.
- There are significant scientific and research activities related to the species.
- Only species within its genera; two extant subspecies recognized by IUCN/SSC Asian Rhino Specialist Group



## Space Analysis

A Space Survey was completed in 2020. Surveys were distributed to 96 AZA institutions including all Institutional Representatives for the TAG, AZA related facilities and non-AZA facilities. AZA organizations with specialized taxonomic collections that do not hold rhinos such as aquariums, primate, felid, and canid centers were not surveyed. Surveys were returned by 94 of the institutions (98%). Survey responses were compiled to determine the rhino program space currently available, and spaces that will be available in the future for rhino programs (Appendix 1), as well as whether they are involved in research, funding conservation directly related to rhinos, and several other aspects that are critical to the decision making process for rhinos in AZA facilities. Appendix 1.

Results of the Space Survey indicate that currently there are 418 spaces being occupied by rhinos and a current capacity for 418 rhinos in institutions coordinated by the Rhino Taxon Advisory Group. Within the next 5 – 10 years, the Space Survey results indicate that the maximum capacity will increase within participating institutions to 548 spaces. As usual, the future space capacity is not heavily weighted since historically this has proven to be inaccurate. The specific information about each species outlined below is from the Space Survey and the numbers don't equal the Breeding & Transfer Plan information.

The Eastern black rhino population is currently 28.20.6 and is desired to go to 28.24.16 which is reasonable based on spaces available, the current B & T Plan and the timeline of this RCP. The southern white rhino population is the largest of the three *ex situ* species and is currently 102.184.0 and the desired capacity is 65.144.54. Again there is an outlier that currently houses 18.42 and can handle 100 white rhinos. The birth requests, and desired space use will be addressed through the SSP. GOH rhinos currently have 37.41.2 in the population with a desired number being 20.30.18. There is an outlier that can handle up to 50 GOHR, but for the purposes of this document, that is too far into the future to consider. Interestingly, the desired capacity for GOHR goes down by 17.11 but requests 16 more calves. This discrepancy will be investigated by the SSP.

<b>Species</b>	<b>Current Holding</b>	<b>Current Capacity</b>	<b>Future Capacity 5 years</b>	<b>Target</b>
<b>Black Rhino</b> <i>Eastern Black</i>	55 B & T Plan 57 Space Survey 2020	57	77	77
<b>White Rhino</b> <i>Southern White</i>	286 B & T Plan 228 Space Survey 2020	286	313	300
<b>GOH Rhino</b>	78 B & T Plan 80 Space Survey 2020	106	159	85

**Table 6. AZA Rhino TAG Program Status Table, 2021**

Species	Date of Last Studbook	Date of Last B&T Plan	Current Population Size (N) (as of most recent Studbook or B&T Plan)	Current Number of Participating Institutions (AZA and Non-AZA)	Current and Projected % GD	AZA Program Designation	5 Year Target Population Size	Space Needed (TPS – N)	Recent 5 year Population Trend (increasing, decreasing, or stable)	Status IUCN CITES
<b>Rhinoceros</b>										
<b>Eastern black rhino</b> <i>Diceros bicornis michaeli</i>	2018	2021	55 (29.25.1)	AZA	Current GD 95.5% Projected GD 85.6% at 100 years	Regional Studbook & Yellow SSP	77	21	Increasing	Critically endangered Appendix 1
<b>Southern white rhino</b> <i>Ceratotherium simum simum</i>	2019	2021	102.184 (286)	50 AZA 1 Sustainability Partner	Current GD 97.9% Projected GD ~94.5% at 100 years	Regional Studbook & Green SSP	300	14	Increasing	Near threatened Appendix 2
<b>Greater one-horned rhino</b> <i>Rhinoceros unicornis</i>	2019	2021	78 (35.43)	AZA	Current GD 94.65% Projected GD 84.7% at 100 years	Regional Studbook & Yellow SSP	85	7	Increasing	Vulnerable Appendix 1

**Table 7. AZA Rhino TAG Program Goals and Essential Actions Table**

<b>Common Name/Scientific Name</b>	Rhino TAG
<b>Animal Program Designation</b>	Rhino TAG
<b>Mission</b>	To provide leadership and coordination to AZA institutions for rhino conservation and management programs both <i>ex situ</i> and <i>in situ</i> (Eastern black rhino, southern white rhino and Greater one horned rhino) and <i>in situ</i> only--Javan and Sumatran rhinos.
<b>Goal 1/Essential Action(s)</b>	Communicate directly with each program leader at least quarterly to discuss how/whether the TAG and SSP are meeting the holder's needs.
<b>Progress</b>	This is a new goal for this RCP. Historically communication has been specific to needs. Going forward these quarterly discussions can be more proactive.
<b>Goal 2/Essential Action(s)</b>	Initiate a quarterly 'zoom' meeting with EAZA TAG chair and program leaders and the AZA TAG chair and program leaders to discuss global rhino conservation measures.
<b>Progress</b>	This is a new goal for this RCP. The rhino TAGs on both sides of the ocean face similar challenges and opportunities. There has historically been a good relationship, but it's mainly on a 'personal' level. To attain this goal, the TAG should plan for a meeting (phone, zoom, etc) at least twice, and preferably four times a year. This would provide more opportunities to work collaboratively with the Europeans and have an even bigger global impact on rhino conservation. Since there are so many rhino conservation programs, there could be a stronger impact with collaborative thinking.
<b>Goal 3/Essential Actions(s)</b>	Mentor new leaders for the succession of the Rhino TAG.
<b>Progress</b>	Not a new idea, but a new goal. The International Rhino Keeper Association is perfectly suited to this. The AZA annual and mid-year meetings also provide opportunities.
<b>Rhinoceros</b>	
<b>Common Name/Scientific Name</b>	Eastern Black Rhino, <i>Diceros bicornis michaeli</i>
<b>Animal Program Designation</b>	Regional Studbook & Yellow SSP
<b>Primary Role</b>	Education/Exhibit Needs
<b>Goal 1/Essential Action(s)</b>	Increase captive population birth rate through improved science, better management and increased space availability.
<b>Progress</b>	There have already been several new facilities built for eastern black rhino. Through expanding the potential spaces (created by building new areas and transitioning from white to black rhinos) the SSP has been able to recommend more breeding to produce more calves. It is understood that all species of rhinos may experience pathology if they aren't reproducing by a certain age, and the recommendations will reflect the intent to get those females between 5-10 years old into breeding situations
<b>Goal 2/Essential Action(s)</b>	Increase captive space, by acquiring one to two new spaces each year.
<b>Progress</b>	There have already been a couple of new exhibits built in the AZA for black rhinos. One facility has committed to swapping white rhinos for black rhinos. The SSP will continue to work with the other SSP coordinators and AZA zoos to increase space availability. This is a lofty goal, especially with the white rhino SSP expanding its Target Population Size, but the eastern black rhino remains the captive species in most need of conservation.
<b>Goal 3/Essential Action(s)</b>	Support <i>in situ</i> conservation in Africa annually through donations to the IRF, capacity building through IRKA, and funding AAZK and other programs that the AZA partners with
<b>Progress</b>	A bull from San Diego was exported to Tanzania as part of a rhino breeding program in 2018. The SSP and TAG will continue to work with the IRF, EAZA, and other entities to identify win-win scenarios for implementing conservation applications through the captive breeding program. Also, the AZA Black Rhino SAFE program just raised \$100,000.00 to protect black rhino habitat in Namibia in 2021.

<b>Common Name/Scientific Name</b>	Southern White Rhino, <i>Ceratotherium simum simum</i>
<b>Animal Program Designation</b>	Regional Studbook & Green SSP
<b>Primary Role</b>	Education/Exhibit Needs
<b>Goal 1/Essential Action(s)</b>	Shift or balance space with other rhino programs. Modify one facility per year from white rhinos to eastern black rhinos.
<b>Progress</b>	This SSP has dominated the spaces within AZA for decades. Since 2007 the TAG and white and black rhino SSP coordinators have pushed to change some of the smaller spaces holding white rhinos to holding black rhinos. It has met with minimal success, but remains a focus goal of the TAG and SSPs.
<b>Goal 2/Essential Action(s)</b>	Increase male holding space and opportunities. Multiple male housing survey completed by 2022 to provide the science to provide opportunities for better male holding. Also, Goal 2a—research opportunities to reduce aggression in males through chemical means working with the Reproductive Management Center (RMC).
<b>Progress</b>	The International Rhino Keeper Association has taken on the role of putting out a survey and will compile the data for all historical examples of males living together. With this data, the SSP can improve and expand opportunities to hold multiple males.
<b>Goal 3/Essential Action (s)</b>	Organize a meeting (with GOHR researchers included) to research chemical options for reducing aggression in males held together.
<b>Progress</b>	New Goal. There has been interest (in both white and GOH rhino leadership) to explore options, including through chemical means.
<b>Goal 4/Essential Action(s)</b>	Increase productivity in the currently non-breeding, unrepresented rhinos through reducing the breeding of over represented rhinos which are filling spaces with their offspring. Provide improved opportunities for the non-producers to breed through the life of this RCP.
<b>Progress</b>	Ironically, the success of this program may ultimately require less breeding. There are several AZA institutions (and one non-AZA facility) that are producing the majority of white rhinos in captivity. We need to continue to monitor over represented animals with the focus on non-represented animals beginning to breed.
<b>Common Name/Scientific Name</b>	Greater One-horned Rhino, <i>Rhinoceros unicornis</i>
<b>Animal Program Designation</b>	Regional Studbook & Yellow SSP
<b>Primary Role</b>	Education/Exhibit needs
<b>Goal 1/Essential Action(s)</b>	Utilize video conferencing technologies to improve blood collection techniques and other husbandry enhancements through collaboration, observation, and conversation two to four times per year.
<b>Progress</b>	The first webinar took place in 2021 focused on blood collection techniques.
<b>Goal 2/Essential Action(s)</b>	Organize a meeting in 2022 to identify ways to house bachelor males for longer periods, working in collaboration with the white rhino SSP, the RMC, and the RRC.
<b>Progress</b>	There has been interest (in both white and GOH rhino leadership) to explore options, including through chemical means
<b>Goal 3/Essential Action(s)</b>	Support the next iteration of Indian Rhino Vision 2020 projects, India, which will include Nepal.
<b>Progress</b>	It is unknown how the new iteration will look. AZA should review and if feasible, support the <i>in situ</i> conservation efforts

## Appendix 1

### Eastern Black Rhinoceros

Zoo	Respondent	Plan to Acquire Eastern Black within 5 years?	In-situ conservation efforts?	Research efforts?	Covid impacts?	Group Type?	Reason for Housing?	Total Current	Total Desired	How many offspring can be held?	For how many years?	Intact, mature male capacity	Other species be considered for same space?
Saint Louis Zoo (North Campus)	Martha Fischer	Y	see white rhino page		N	Non breeding	Display	0	0.0.1	0		1	No
Cleveland Metroparks Zoo	Travis Vineyard		Providing financial support for related conservation work in both Africa and Asia. Focusing on projects under the tenant of illegal wildlife trade	Research has been based on nutritional studies focusing on: browse consumption, reproduction, new exhibit space use	N	Breeding	Breeding	1.2.1	1.2.2	2	Up to 4	1	No
Sedgewick County Zoo	Mike Quick		Kingdom of Eswatini's National Rhino Conservation Project		N	Breeding	Breeding	1.1	1.1	1	3	1	No
Oregon Zoo	Bob Lee	Y			N	Future addition	Breeding	0	1.1	1	3	1	No



Blank Park Zoo	Kayla Freeman			Collaborated with Dr. M Renner on calf development, participating in rhino health study with Dr. Pukazhenth and with iron storage study	N	Breeding	Breeding	1.1.2	1.1.1	2	3	1	No
Milwaukee County Zoo	Tim Wild		IRF	Yes, 4 projects	Y	Non breeding	Future breeding	0.1	1.1.1	1	?	?	No
Zoo Miami	Joseph Svoke		IRF	N	N	Breeding	Breeding	2.1	1.1.1	1	4	2	No
Racine Zoo	Aszya Summers		N	N	N	Breeding	Breeding	1.1	1.1.1	1	3	1	No
Blank Park Zoo	Kalya Freeman		Y	Yes, 4 projects	N	Breeding	Breeding	1.1.2	1.1.1	2	3	1	No
Brookfield Zoo	Joan Daniels		IRF	Yes, 2 projects	N	Breeding	Breeding	2.1	1.1.1	1	3	2	No
Caldwell Zoo	Scotty Stainback		IRF	Yes, 1	N	Non breeding	Display	0.1	1	0	0	1	UNK
Lincoln Park Zoo	Mike Murray		N	Yes, 2 projects	N	Breeding	Breeding	2.1	1.1.2	2	3	2	No
Kansas City Zoo	Joni Hartman		Y	N	N	Breeding	BOTH	2.2	2.2.1	1	1	2	No
Columbus Zoo	Adam Felts		Y	Yes, 2 projects	Y	Non breeding	Display	0.1	0	0	0	0	GOHR
Potter Park Zoo	Pat Fountain		N	Yes, 4 projects	N	Breeding	Breeding	1.1.1	1.1.1	1	3	1	Southern
Great Plains Zoo	Mollye Nardi		Y	N	N	Breeding	Breeding	2.1	1.1.1	1	3	1	No

San Diego Safari Park	Steve Metzler		y	Y	Y	Breeding	Breeding	1.1	1.1.1	1	2	1	No
San Francisco Zoo	Jim Nappi		N	Yes, 1	Y	Non breeding	Display	1	1	0	0	1	No
The Living Desert Zoo	Roxanna Breitigan	Y	Y	N	N	Breeding	Breeding	0	1.1	1	3	1	No
Disney Animal Kingdom	Robyn Johnson	Y	Y	Y	N	Future addition	Future breeding	0	1.1	2	3	1	
Lee Richardson Zoo	Kristi Newland		Y	Y	N	Breeding	Breeding	1.1	1.1.1	1	3	1	No
Houston Zoo	Darryl Hoffman		N	N	N	Non breeding	Display	2	2	0	0	2	No
Cincinnati Zoo	Christina Gorsuch		N	Yes, 6 projects	N	Breeding	Breeding	1.1.1	1.1.1	1	1 to 3	1	No
Africam Safari	Frank C. Camacho		Y	N	N	Non breeding	Future breeding	1	1.1	2	5	2	No
Buffalo Zoo	Lisa Smith		Y	Y	N	Display	Display	1	0	0	0	0	No
Saint Louis Zoo	Katie Kloppe		Y	N	N	Breeding	Breeding	1.1.1	1.1.1	1	3	1	No
Cheyenne Mountain Zoo	Jason Bredahl		Y	N	N	Non breeding	Display	1	1	0	0	1	No
Busch Gardens	Jason Green		Y	N	N	Non breeding	Future breeding	1.1	1.2	2	3	1	No
Denver Zoo	Dale Leeds		N	Y	N	Non breeding	Display	1	1	0	0	1	No

Southern White Rhinoceros

Zoo	Respondent	Plan to Acquire Southern Whites within 5 years?	In-situ conservation efforts?	Research efforts?	Covid impacts?	Group Type?	Reason for Housing?	Total Current	Total Desired	How many offspring can be held?	For how many years?	Intact, mature male capacity	Other species be considered for same space?
St. Louis (North Campus)	Martha Fischer	Y	The Zoo's WildCare Institute Center for Conservation in the Horn of Africa supports black rhino conservation and protection in Kenya (through Northern Rangelands Trust & Sera Rhino Conservancy). The Zoo's WildCare Institute Rhino Conservation Program supports rhino protection in southern Africa (through International Rhino Foundation's Stop Poaching Now program)		N	Future Breeding (2023)	Future Breeding	0	1.5.5	5	5	1 or 2	No

White Oak	Scotty Wade		see GOHR tab		N	Breeding	Breeding	10.29	10.29.15	15	10	4	
Knoxville	Melissa McGee				N	Non breeding	Display	0.2	0.2	0		0	No
Seneca Park	David Hamilton		We hold Bowling for Rhinos event every year and contribute funds to Lewa Conservancy		N	Non breeding	Display	1	1	0	0	1	No
Reid Park	Adam Ramsey		N		N	Non breeding	Display	1.1	1.1	0	0	1	Potential
Fresno	Vernon Presley		N		Y	Breeding	Breeding	2.1	1.1	1	1	1	No
San Antonio	Rachel Malstaff		N	N	N	Breeding	Future Breeding	0.2	1.2	1	3	1	No
Safari Niagara	Lana Borg		Donate to IRF	N	N	Non breeding	Future Breeding	2	1.1	3	Indefinitely	2	No
Brevard Zoo	Laura Hinson		N	N	N	Breeding	Breeding	1.2	1.2.1	1	2	1	No
Wildlife Safari	Dan Brands		Y	N	N	Breeding	Breeding	1.1	1.2.1	2	2	1	No
Hogle	Lauren LeCoque		Y	N	N	Non breeding	Display	1.1	1.1	0	0	1	No
Rolling Hills	Brenda Gunder		N	N	N	Non breeding	Future Breeding	1	1.1.2	2	5	1	No
Potawatomi	Anna Pelc		N	N	N	Non breeding	Display	1	1	0	0	1	No
Wildlife Conservation Society	Donna Doherty		N	N	N	Non breeding	Display	2	2	0	0	2	no
Maryland	Erin Grimm		N	N	N	Non breeding	Display	1	2	0	0	2	No
Birmingham	Amy Toman		N	Y	N	Breeding	Breeding	1.2	1.2.1	1	3	1	No

Toronto	Brent Huffman		Y	N	N	Breeding	Breeding	2.2	1.2.1	1	4	1	No
Albuquerque	Erin Flynn		N	N	N	Non breeding	Display	1.1	Up to 4	1	As needed	1	No
San Diego SP	Steve Metzler		Y	Y	Y	Breeding	Breeding	6.17	2.12.3	6	3		No
Virginia Zoo	Jennifer McNamara		N	Y	N	Breeding	Breeding	1.2	1.2.2	2	3	1	No
Granby	Chantal Routhier		N	N	N	Non breeding	Future Breeding	1.1	1.2.1	1	3	1	No
Disney's Animal Kingdom®	Robyn Johnson		Y	Y	N	Breeding	Breeding	1.5	1.5.3	3	3	1	No
Fossil Rim	Adam Eyres		Y	Y	N	Breeding	Breeding	4.4	2.4.2	3	5	2	No
The Wilds	Dan Beetem		Y	Y	Y	Breeding	Breeding	2.9.6	2.6.6	6	3	2	No
Zoo Tampa	Chris Massaro		Y	N	N	Breeding	Breeding	2.5	1.3.3	3	5	1	No
Indianapolis Zoo	David Hagan		Y	Y	N	Breeding	Breeding	1.2	1.3	1	3	1	No
Peoria	Dawn Petefish	AAZK Bowling for Rhinos		N	N	Non breeding	Display	2	2	0	0	1	No
NC Zoo	Erin Ivory		Y	Y,4	N	Breeding	Breeding	1.5.4	1.6	2	2	1	No
Safari West	Erika Defer		N	N	N	Breeding	Breeding	2.1	1.3.1	1	3	2	No
Jacksonville	Craig Miller		Y	N	N	Breeding	Breeding	1.1	1.2	1 to 2	2	1	No
Riverbanks	John Davis		y	N	N	Breeding	Breeding	1.2	1.2.1	2	3	1	No
Cameron Park	Manda Butler		Y	N	N	Breeding	Breeding	1.2	1.2.1	2	4		No
Omaha	Dan Houser		Y	Y	Y	Breeding	Breeding	1.1.1	1.1.1	1	3	1	No
Gladys Porter	Walter Dupree		N	N	Y	Breeding	Breeding	1.2	1.2.0	2	2	1	No
Tulsa	Jordan Piha		Y	N	N	Breeding	Breeding	1.2	1.2.1	2	4	2	No
Zoo Atlanta	Danielle Summer		N	N	N	Non breeding	Future Breeding	1	1.2.1	2	2 to 4	1	No

Africam Safari	Frank C. Camacho		Y	N	N	Non breeding	Future Breeding	1	1.2	2	5	2	No
Nashville	Jonathon Hankins		N	Y	Y	Breeding	Breeding	1.4	2.4	2	3	1	No
Phoenix	Paige McNickle		N	N	N	Non breeding	Display	1.1	1.1	0	0	1	No
Audubon	Mandy Turnbull		N	N	N	Non breeding	Future Breeding	1.2	1.2.1	1	3	1	No
Chahinkapa	Tom Schmaltz		Y	N	N	Non breeding	Future Breeding	2	1.1	2	4	2	No
Henry Vilas	Ronda Schwetz		Y	N	N	Non breeding	Display	1	1.1	0	0	0	No
Busch Gardens	Jason Green		Y	N	N	Breeding	Breeding	1.4	1.6	2	3	2	No
Philadelphia	Donna Everham		N	N	N	Non breeding	Display	1	1	0	0	1	No
Detroit	Elizabeth Arbaugh		N	Y	N	Non breeding	Display	2	2	0	0	2	No
Topeka	Fawn Moser		Y	N	N	OPEN							
Ellen Trout Zoo	Celia Falzone		N	Y	N	Breeding	Breeding	1.1	1.1	1	3 to 4	1	No
CCTU	Jeff Holland		Y	N	N	Breeding	Breeding	17.35	100	10 to 26	indefinitely	10 to 26	No
Lion Country	Ashleigh Kandrac		Y	Y	N	Breeding	Breeding	2.10.2	2.14	5	5	2	No

Greater One-horned Rhinoceros

Zoo	Respondent	Plan to Acquire GOHR within 5 years?	In-situ conservation efforts?	Research efforts?	Covid impacts?	Group Type?	Reason for Housing?	Total Current	Total Desired	How many offspring can be held?	For how many years?	Intact, mature male capacity	Other species being considered for same space?
Oklahoma City	Rachel Emory		N	N	N	Breeding	Breeding	1.2	1.2	1	3 max	1	No
White Oak	Scotty Wade		White Oak is under the umbrella of Walter Conservation Group which is very active in several rhino conservation programs.	N	N	Breeding	Breeding	2.7	2.7.5	5	10	4	No
Fresno	Vernon Presley		Donate to IRF		Y	Non breeding	Display	2	1	0	0	1	
Safari Niagara	Lana Borg		Donate to IRF	N	N	Non breeding	Future breeding	2	1.1	3	TBD	2	No
SDZ	Curby Simerson		Y	N	Y	Non breeding	Display	1	1	0	0	1	Yes, black or white rhino
Miami	Joseph Svoke		Donate to IRF	N	N	Breeding	Breeding	1.2.0	1.1.1	1	TBD	2	No

Rolling Hills	Brenda Gunder		N	N	N	Display	Display	1	0	0		0	White rhino once male GOHR dies
Central Florida	Tracey Sorenson		N	N	N	Non breeding	Display	1	0	0	0	1	No
WCS	Donna Doherty		N	N	N	Breeding	Breeding	1.4	1.3.1	1	5	1	No
Mesker Park	Sue Lindsey		Y	Y	N	Non breeding	Display	1.1	1.1	N/A	N/A	1	No
Toronto	Brent Huffman		Y	N	Y	Non breeding	Display	2.1	0	N/A	N/A	0	Yes
San Diego Safari Park	Steve Metzler		Y	Y	Y	Breeding	Breeding	3.6	1.5.2	3	3	1	No
San Francisco	Jim Nappi		N	Y	Y	Non breeding	Display	1	1	0	0	1	No
The Wilds	Dan Beetem		Y	Y	Y	Breeding	Breeding	1.2	1.3.3	3	3	3	No
Zoo Tampa	Chris Massaro		Y	N	N	Breeding	Breeding	1.1	1.1.1	1	3	1	No
Woodland Park	Martin Ramirez		Y	N	N	Non breeding	Future breeding	2	1.1.1	1	2	2	No
Omaha	Dan Houser		Y	Y	Y	Breeding	Breeding	1.1.1	1.1.1	1	4	1	No
Toledo	Michael Frushour		N	N	N	Non breeding	Display	1	1	0	0	1	No
Africam Safari	Frank C. Camacho	Y	Y	N	N	Future addition	Future breeding	0	1.1.1	2	5	1	No
Buffalo	Lisa Smith		Y	Y	Y	Breeding	Breeding	1.1.1	1.1.1	1	2	1	No
Fort Worth	Mike Fouraker	Y	Y	N	N	??	??	0	1.1	?	?	?	?
Denver	Dale Leeds		N	Y	N	Breeding	Breeding	1.2	1.1.1	1	5	1	No
CCTU	Jeff Holland		Y	N	N	Breeding	Breeding	10.11	50	16 to 26	TBD	16 to 26	No



Southern Black Rhinoceros

Zoo	Respondent	Plan to Acquire southern black within 5 years?	In-situ conservation efforts?	Research efforts?	Covid impacts?	Group Type?	Reason for Housing?	Total Current	Total Desired	How many offspring can be held?	For how many years?	Intact, mature male capacity	Other species be considered for same space?
White Oak	Scotty Wade		See GOHR table		N	Breeding	Breeding	3.1	5.3.3	3	10	3	N
Disney's Animal Kingdom®	Robyn Johnson		Y	Y	N	Non breeding	Display	2	2	0	0	2	Yes, Eastern black
Fossil Rim	Adam Eyres		Y	Y	N	Breeding	Breeding	1.3	1.3.2	2	5	1	N
Abilene	Denise Ibarra		N	Y	N	Non breeding	Display	1	1	0	0	1	
Africam Safari	Frank C Camacho		Y	N	N	Non breeding	Future breeding	1	1.1	2	5	2	N
Fort Worth	Mike Fouraker		Y	N	N	?	?	2.1	?	?	?	?	