



Hippo, Peccary, Pig and Tapir TAG

2022 Ungulate TAG Update

WOODLAND PARK ZOO SAVES ANIMALS AND
THEIR HABITATS THROUGH CONSERVATION
LEADERSHIP AND ENGAGING EXPERIENCES,
INSPIRING PEOPLE TO LEARN, CARE AND ACT.

[ZOO.ORG](https://www.zoo.org)

TAG Leadership



TAG Chair Martin Ramirez,
Woodland Park Zoo

Vice Chair RoxAnna Breitigan
Living Desert

Secretary Dawn Petefish
Peoria Zoo



TAG Steering Committee



Ashley Arimborgo	Cheyenne Mtn Zoo
John Davis	Riverbanks Zoo
Joe Forys	Audubon Zoo
Christina Gorsuch	Cincinnati Zoo
Lisa Smith	Buffalo Zoo
John Register	Houston Zoo
J T Svoke	Zoo Miami
Jonathon Hankins	Nashville Zoo
Christie Eddie	Omaha's Henry Doorly Zoo
Adam Ramsey	Reid Park Zoo



In appreciation of their service



Program Leaders

Craig Miller

Carolina Holguin

Steering Committee

Tom Ness



Three Year Action Plan 2021-2024

- Strengthen partnerships with the newly merged tapir stakeholders and create a process for maximizing the strengths of the TAGs steering committee members and advisors. Hold re-elections for half of steering committee members in 2023.
- Partner with ungulate TAGs to develop Animal Care Manuals and breeding protocols for all seven species of pigs and peccaries currently in North America.
- Coordinate Advisory Group activities with those of the IUCN's Pigs, Peccaries and Hippos Specialist Group as well as the IUCN Tapir Specialist Group on behalf of hippo, pig, peccary and tapir conservation. Encourage participation to Joint TAG meetings.
- Provide resources and guidance to AZA species holders as current SSPs evolve under the new paradigm. Encourage species holders to maintain their commitment to the program regardless of its designation.



Assessment Scoring Sheet



Species	Genetics	Demography	Space & Interest	Husbandry	Designation
Asian Tapir <i>Tapirus indicus</i>	N	+	+	N	Signature
Baird's Tapir <i>Tapirus bairdii</i>	N	-	-	-	Studbook
Chacoan Peccary <i>Catagonus wagneri</i>	-	+	+	+	Provisional
Common Warthog <i>Phacochoerus africanus</i>	-	+	+	N	Provisional
Northern Sulawesi Babirusa <i>Babyrousa celebensis</i>	-	+	+	N	Provisional
Pygmy Hippo <i>Choeropsis liberiensis</i>	N	+	+	+	Signature
Red River Hog <i>Potamochoerus porcus</i>	N	+	+	-	Provisional
River Hippo <i>Hippopotamus amphibius amphibius</i>	+	+	N	N	Signature
Visayan Warty Pig <i>Sus cebifrons</i>	-	-	-	N	Studbook

New Designations



Common Name (Scientific Name)	New 2022 SSP Program Designation	Previous SSP Program Designation	Contact (Name, Email)
Asian Tapir <i>Tapirus indicus</i>	Signature	Red SSP	Ivy Brower ivy.brower@miamidade.gov
Baird's Tapir <i>Tapirus bairdii</i>	Studbook	Red SSP	Carolina Holguin cholguin@africansafari.com
Chacoan Peccary <i>Catagonus wagneri</i>	Provisional	Yellow SSP	Jim Haigwood JHaigwood@sdzwa.org
Common Warthog <i>Phacochoerus africanus</i>	Provisional	Yellow SSP	Lisa Smith lsmith@buffalozoo.org
Northern Sulawesi Babirusa <i>Babyrousa celebensis</i>	Provisional (GSMP)	Yellow SSP	Joe Forys jforys@auduboninstitute.org
Pygmy Hippo <i>Choeropsis liberiensis</i>	Signature	Yellow SSP	Christie Eddie christiee@omahazoo.com
Red River Hog <i>Potamochoerus porcus</i>	Provisional	Yellow SSP	Mel Hall Melissa.A.Hall@disney.com
River Hippo <i>Hippopotamus amphibius amphibius</i>	Signature	Yellow SSP	Kristen Wolfe Kristen.Wolfe@disney.com
Visayan Warty Pig <i>Sus Cebifrons</i>	Studbook	Red SSP	Craig Miller millerc@jacksonvillezoo.org

North Sulawesi Babirusa



29.39 animals in 18 institutions

Provisional SSP

Endangered/Threatened – wild population decreasing due to illegal hunting and habitat loss.

GSMP program working with Action Indonesia. All holders encouraged to support the program.

We are actively seeking new institutions to join the program.

Babirusa are a wonderful species to work with. They are a hit with staff and guests.

Babirusa mix well with other species, both ANIMALS and PLANTS.



Program Leader

Joe Forys- GSMP/Studbook
Audubon Zoo

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Chacoan Peccary



48.56.0 (104) at 24 AZA Zoos and 1 ZAA

Provisional SSP ↑

Endangered - **wild population** ↓

Challenges that affect this program:

Additional funding sources needed
for CCCI and an import.

What can TAG do to help program & improve
sustainability?

Encourage more institutions to work with this low
maintenance and charismatic endangered species.



Program Leader
Jim Haigwood – SSP
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Ashley Roberts – Studbook
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San Diego Zoo

Common Warthog



34.46.0 (80) @ 32 AZA institutions

Provisional SSP (old designation: Yellow SSP) – zoo population decreasing

IUCN status – Least Concern, stable

Breeding and Transfer Plan published 27 January 2023

Challenges that affect program:

- Only 11% of Breeding recs attempted from 2019 plan
- Holding of offspring past 1 yr. makes space a challenge and makes institutions not want to breed.
- Deaths and exports to non-AZA facilities exceeding births at AZA facilities
- **What Institutions can do to help program & improve sustainability?**
 - Increase holding capacity when building new or renovating exhibits/holding areas
 - Do not export animals from population without talking to SSP Coordinator



Program Leader

Lisa Smith –SSP/Studbook

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Signature SSP

22.24 (46) at 16 institutions.

- 15.16 (31) at 14 AZA institutions.
- 6.7 (13) CCTU
- 1.1 (2) Rutledge

RCP Target Population: 58

Genetic Diversity: ~92%

Adding 2 AZA institutions in 2023

- 1 pending transport
- 1 finishing construction

Adding 1 AZA institution in 2+ years



Program leader

Ivy Brower- SSP/Studbook
Zoo Miami

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Pygmy Hippopotamus



31.71.20(122) in 16 organizations

- 15 AZA organizations
- 1 Sustainability Partner

Signature SSP - planned slow growth

Endangered – wild population ↓

Last two years:

- Still a female-biased sex ratio, which parallels Europe and Asia.
- Recommended 8 existing pairs in 2021 B & T plan /Studbook Keeper
- 3 new AZA zoos joined the SSP as breeding facilities



Program Leader

Christie Eddie – Red SSP Coordinator
/Studbook Keeper

Omaha's Henry Doorly Zoo and
Aquarium

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90.103.5 (198)

122 in 42 AZA institutions

76 in 25 non-AZA institutions

Provisional SSP- zoo population ↓

Low birthrate over the last few breeding seasons. Increased birth rate and could lead to Signature SSP status

Least Concern - wild population ↓

Needs:

Increased breeding success over paired individuals

Additional holders

Look at moving valuable non-breeders next breeding/transfer plan to increase chances of successful breeding and bring genetic diversity



Program Leader

Melanie Hall-Program Leader/Studbook Keeper

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Previous program designation: Yellow SSP

New program designation: Signature SSP

Population & number of institutions:

- 36.65.0 (28 AZA & 5 non-AZA)

IUCN designation and population trend:

- Vulnerable, population is stable

Program challenges:

- Facilities being able to hold more than same sex pairs
- Facilities being able to hold male offspring or bachelor herds
- Several animals in the SSP have unknown pedigrees

What you can do to help this program:

- Consider holding larger herds
- Consider holding bachelor pairs/groups if not a breeding institution
- Optional other interesting tib-bits of info:
 - Hippos make great guest interaction experiences



Program Leader

Kristen Wolfe- SSP/Studbook

Disney's Animal Kingdom

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Visayan warty pig and Baird's Tapir



21.26 in 10 AZA facilities

Vacant – Studbook Keeper

**Posting delayed pending
outcome of new designation**



19.13 in 14 AZA facilities

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Currently working off last BTP from 2021



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<https://www.iucn-wpsg.org/newsletter>



Ecology and Conservation

One Plan Approach to save species

— a new integrative Regional Collection Plan for hippos, pigs, peccaries, and tapirs

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Introduction

In November 2020, the Tapir and Suiform Taxon Advisory Group (TAG) of the European Association of Zoos and Aquaria (EAZA) conducted its Regional Collection Plan (RCP) online-workshop. EAZA RCPs follow the 'IUCN Guidelines on the Use of Ex situ Management for Species Conservation' (IUCN/SSC, 2014) to recommend which species should be managed under an EAZA Ex situ Programme and specify which direct and/or indirect conservation and/or non-conservation roles these Programmes aim to fulfil for each species. Twenty seven taxa from four families — Hippopotamidae, Suidae, Tayassuidae, and Tapiridae — were evaluated during the RCP workshop, despite the fact that only nine species are currently held (N = 3 individuals) in EAZA institutions (Figures 1–3).

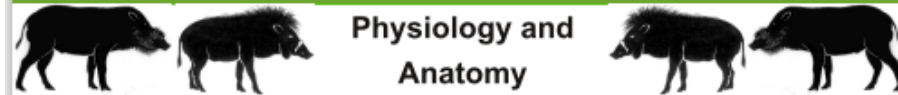
This new and comprehensive RCP follows the One Plan Approach: 'the joint development of management strategies and conservation actions for all populations of a species by all



Fig. 1: The Vulnerable (IUCN Red List) Sulawesi babirusa (*Babyrousa babyrussa*) at Nuremberg Zoo. Photo: J. Beckmann



Fig. 2: The Critically Endangered (IUCN Red List) Visayan warty pig (*Sus cebifrons*) at Ostrava Zoo. Photo: J. Pluháček



Physiology and Anatomy

Observation of mandibular yaw movement in the Sulawesi babirusa (*Babyrousa celebensis*)

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Abstract

Recent observations of babirusa skulls have found there are two types of wear patterns on the molar teeth, suggesting a relationship with the grinding of their specific diet in the wild. Yaw rotation, which is involved in the transverse grinding of food particles, has not been reported for the babirusa mandible. Therefore, we have sought a simple protocol to geometrically describe such a motion based on videos of a male babirusa. When observed in frontal view, the yaw movement of the babirusa mandible could be shown as a waveform with approximately three cycles per second on the position-time graph based on the measured x-coordinates of the mandibular canines.

Keywords: babirusa, canine teeth, mastication, video analysis, yaw rotation

Introduction

The Sulawesi babirusa (*Babyrousa celebensis*) inhabits the tropical rainforest on the banks of rivers and ponds on Sulawesi and some neighbouring islands in Indonesia (Macdonald, 2017a). Their natural habitat nurtures a wide variety of fruit-bearing trees, and fruit has been assessed as a particularly important component of the diet for the babirusa (Leus, 1996; Macdonald, 2017a). Detailed examination of the teeth in babirusa skull specimens described their surface structure as well as the progressive wear of the molar crowns, and pointed out the differences in wear from those of domestic pigs (Macdonald, 2019). More recent observations have revealed two types of erosive wear patterns on babirusa molar teeth, suggesting a relationship with the transverse grinding of their specific diet in the wild, such as seeds of certain fruits (Macdonald, 2021).

Mastication in mammals is a cyclic movement of the mandible, tongue and hyoid apparatus (Weijjs, 1994). In domestic pigs, mandibular movements for mastication include 1) pitch rotation (i.e., straight up and down movements by rotation around the mediolaterally oriented axis through the condylar processes), 2) yaw rotation (i.e., transverse movements by rotation around the dorsoventrally oriented axis) and 3) rostrocaudal translation (i.e., protraction and retraction along the anteroposterior axis) (Menegaz et al., 2015; Grossnickle, 2017). The main mandibular movement in pigs and babirusa is pitch rotation, which is easily visible. On the other hand, the yaw rotation in pigs is not easy to observe. In previous studies, the yaw movement in domestic pigs was recognised by observing the mandibular incisor teeth moving from side to side across the midline (Herring & Scapino, 1973; Herring, 1976; Langenbach et al., 2002). However, when



IUCN SSC
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SPECIALIST
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<https://www.hipposg.org/>

TAPIR CONSERVATION

The Newsletter of the IUCN/SSC Tapir Specialist Group

www.tapirs.org



<https://tapirs.org/resources/newsletter/>



Thank You