



ACTION INDONESIA

GLOBAL SPECIES MANAGEMENT PLAN

FOR ANOA, BANTENG, BABIRUSA AND SUMATRAN TIGER



Cover photo: Babirusa. Photo: Chester Zoo

ANNUAL REPORT 2023

ACTION INDONESIA FOUNDING MEMBERS:



World Association of
Zoos and Aquariums
WAZA | United for
Conservation

ASSOCIATION
OF ZOOS &
AQUARIUMS



ZOO
AQUARIUM
ASSOCIATION
AUSTRALASIA

AWCSG
Asian
Wild
Cattle
Specialist
Group



SSC
Species Survival Commission

WFGSG
IUCN/SSC: Wild Pig Specialist Group



Achievements of Action Indonesia in 2023

Anoa, banteng, babirusa and Sumatran tiger all occur within Indonesia and are under threat of extinction due to hunting and habitat loss. The Action Indonesia Partnership was created with the aim to promote international collaboration to ensure the long-term survival of these species by a combination of *ex situ* and *in situ* activities. This used the World Association of Zoos and Aquariums (WAZA) Global Species Management Plans (GSMPs) frameworks for banteng, anoa and babirusa.

This year we have started to implement our ambitious objectives set out in our masterplan last year. We are proud to have conducted a wide range of *in situ* and *ex situ* activities in population monitoring, genetic sampling, husbandry training, professional capacity building and raising awareness, and we look forward to even more progress in 2024! We are very thankful for your continued support, partnership and collaboration. Below is a summary of our achievements:

- The Action Indonesia GSMP 2023-2025 masterplan was officially approved by WAZA.
- Genetic sampling training for wild banteng was conducted with National Park staff in May, with sampling completed in at least one National Park in 2023.
- The GSMP, PKBSI and Alas Purwo National Park implemented the third year of camera trapping to monitor banteng populations in a priority area for the species in East Java.
- Continued breeding of GSMP species has occurred following the latest set of breeding and transfer recommendations developed and distributed to Indonesian zoos in 2022.
- The fifth Action Indonesia Day was held on August 13th to raise awareness for GSMP species. Over 40 organisations got involved in a successful day of virtual events and activities.
- The first year of camera trapping for anoa and babirusa was conducted in Faruhumpenai Nature Reserve, with 29 cameras deployed in partnership with Universitas Hasanuddin and the Ministry of Environment and Forestry.
- The GSMP and the PKBSI Education Division delivered in person training workshops on tiger husbandry, and 'Training the Trainer' to Indonesian zoo staff. Zoo visits to 12 zoos by international experts enabled the exchange of bespoke advice and troubleshooting to support the breeding and transfer recommendations.
- The GSMPs were represented in the EAZA Annual conference, the SEAZA conference and the AZA mid-year conference.
- The GSMP Education WG developed resources and held a public webinar on genetic diversity of small populations, which was attended by approximately 80 people.
- We continued fundraising efforts to support GSMP activities.
- The GSMP supported the increase of population management and welfare assessment capacity in PKBSI through supporting and delivering technical training.

Thank you for your support and contributions!

						
James Burton	Marcel Alaze	Joe Forys	Ivan Chandra	Corinne Bailey	JT Svoke	Malcolm Fitzpatrick
Chair IUCN SSC AWCSG	Convenor Anoa GSMP	Convenor Babirusa GSMP	Convenor Banteng GSMP	Programme Officer IUCN SSC AWCSG	Co- convenor Banteng GSMP	Convenor Sumatran Tiger GSMP

Background:

What are GSMPs?

Global Species Management Plans (GSMPs) bring together zoos, governments, and conservation organisations from multiple regions to achieve globally agreed *ex situ* and *in situ* conservation goals for a species. The GSMPs are administered by the World Association for Zoos and Aquaria (WAZA) and run by committees of representatives of the regional zoo associations participating in the collaboration.

Action Indonesia GSMPs

The partners of the Action Indonesia GSMPs collaborate for the conservation of the threatened Indonesian taxa; **anoa** (*Bubalus depressicornis* and *B. quarlesi*), **banteng** (*Bos javanicus*) and **babirusa** (*Babirusa* spp.; three species). We also work together with the **Sumatran tiger** (*Panthera tigris sumatrae*) GSMP to align our activities. These GSMPs use the One Plan Approach to combine the skills, resources and expertise of both the zoo community and *in situ* practitioners. The coordination of the GSMPs is carried out by the Indonesian Zoo and Aquarium Association (PKBSI) and the IUCN SSC Asian Wild Cattle Specialist Group.

In this report, we detail our achievements in three main areas of activity that align to the following goals:

1. *Ex situ* conservation: Healthy back up *ex situ* populations fit for reintroduction
2. Education: Action and support for conservation of target species
3. *In situ* conservation: Stable and safe *in situ* populations



The four GSMP taxa (left to right): anoa (Photo: Point Defiance Zoo & Aquarium), banteng (Photo: Zoo Wroclaw), babirusa (Photo: Taman Safari Indonesia Bogor) and Sumatran tiger (Photo: Surabaya Zoo)

Your contributions in 2023

The achievements and activities in 2023 were only possible due to your generous contributions and support, including financial contributions, staff time, technical input and the sharing of expertise.

This year, institutions freed work time to allow staff to contribute to various GSMP activities, including the significant time contribution in planning training workshops and visits. Staff also contributed to presenting in conferences and webinars, raising awareness and funds, coordinating genetic sampling, and monitoring and updating the breeding and transfer recommendations process. This in-kind support provided by your institutions or organisations is shown in Table 1.

Table 1 also shows the GSMP activities that contributions by your institutions and organisations have funded or will fund. The hard work of all those involved in activities and the generosity of our supporters is a huge credit to the collaborative partnership of the Action Indonesia GSMPs and the motivation of our partners.

The first section of Table 1 shows contributions to GSMP unrestricted funding. Unrestricted funding is integral to the overall functioning of the GSMPs and to ensure funds are available in the case of urgent activities; these funds are allocated by approval from a majority of the Working Group leaders. Table 1 also shows restricted funding – the contributions to specific activities.

Table 1: Action Indonesia Partner and supporter contributions; all funding, technical and in-kind support for the GSMPs in 2023

Institute/Organisation/Individual	Contribution
Unrestricted funds	
Zoological Society of London, UK	Funds to be used for projects identified as priorities by Working Group leaders.
Marcus Burkhardt, Germany	
Zoo Miami, USA	
Cologne Zoo, Germany	
West Midland Safari Park, UK	
Tiergarten Nürnberg, Germany	
San Diego Zoo Wildlife Alliance, USA	
AllwetterZoo Münster, Germany	
The Wilds, USA	
Nashville Zoo, USA	
Memphis Zoo, USA	
Skaerup Zoo, Denmark	
Wilhelma Zoo, Germany	
Restricted funds	
Chester Zoo, UK	Coordination of the Action Indonesia GSMPs; salary and travel of AWCSG PO and AWCSG Chair; banteng <i>in situ</i> population monitoring, Chester Zoo Scholarship for PKBSI-GSMP officer.
Re:wild, USA	Coordination of the Action Indonesia GSMPs; salary and travel of AWCSG Chair
Nashville Zoo, USA	Sulawesi <i>in situ</i> population monitoring

CERZA, France	Sulawesi <i>in situ</i> population monitoring
Copenhagen Zoo, Denmark	Genetic sampling and analysis of <i>ex situ</i> populations of anoa, banteng and babirusa in Indonesian Zoos
ZSL, UK	PKBSI capacity building in population management and animal welfare MRes support for PKBSI-GSMP Programme Officer
ARTIS Zoo, Netherlands	<i>In situ</i> population monitoring and animal welfare MRes support for PKBSI-GSMP Programme Officer
Zoo Wroclaw, Poland	Banteng <i>in situ</i> population monitoring
Zoo Leipzig, Germany	Salary and travel of AWCSG Chair
Taman Safari Indonesia Bogor, Indonesia	Contribution to PKBSI-GSMP Programme Officer salary
Batu Secret Zoo, Jatim Park, Indonesia	Contribution to PKBSI-GSMP Programme Officer salary
Fauna Land Ancol, Indonesia	Contribution to PKBSI-GSMP Population Management Coordinator salary
Taman Hewan Pematang Siantar, Indonesia	Contribution to PKBSI-GSMP Population Management Coordinator salary
Alas Purwo National Park, Indonesia	Banteng <i>in situ</i> population monitoring; staff time and funds
Jacksonville Zoo CARE programme, USA	Sulawesi <i>in situ</i> population monitoring
Point Defiance Zoo & Aquarium (Holly Reed Fund), USA	Population Management and PKBSI capacity building
In-kind support	
Chester Zoo, UK	Staff time coordinating training in husbandry and education, leading the education and husbandry WG masterplan development
Copenhagen Zoo, Denmark	Mentoring in population genetics for PKBSI and genetic technical advice, genetic analysis of <i>ex situ</i> samples. Leading the Banteng <i>in situ</i> and Genetics WG masterplan development.
ZSL, UK; Point Defiance Zoo & Aquarium, Zoo Miami, USA, Chester Zoo, UK, Ragunan Zoo, Bukittinggi Zoo, Indonesia	Tiger husbandry training and zoo visits to Indonesian zoos; Train the Trainer Training for zoo staff.
Taman Safari Indonesia Bogor, Taman Safari Indonesia Prigen, Ragunan Zoo, Bukittinggi Zoo, Batu Secret Zoo, Surabaya Zoo, Solo Safari, Medan Zoo, Taman Satwa Kandi Sawahlunto, Lembah Hijau Zoo Lampung, Maharani Zoo & Goa Lamongan, Bali Zoo Indonesia	Hosting the GSMP coordination team during in person zoo visits
Alas Purwo National Park, Meru Betiri National Park, Ujung Kulon National Park, Baluran National Park	Staff time contributing to the banteng metapopulation approach and hosting the GSMP coordination team.
National Research and Innovation Agency, Indonesia	Supporting genetic monitoring quality work (field and lab)
Taman Safari Prigen, Taman Safari Bogor, Surabaya Zoo, IPB University Bogor, Indonesia	Staff time for studbook keepers for banteng, anoa, babirusa and Sumatran tiger respectively.
Baluran National Park	Hosting the Banteng Sample Collection Training in May 2023
EAZA Executive office, Netherlands	Staff time population management mentoring and supporting information exchange on population management with PKBSI

Thanks to all Indonesian zoos and institutions that continue to participate in the breeding and recommendations process, taking part in the training, and to all the zoos and institutions around the world that participated in Action Indonesia Day 2023.

1. Ex situ conservation: Healthy back up ex situ populations fit for reintroduction.

Breeding and transfer recommendations 2023-2024:

A primary aim of the Action Indonesia GSMPs is to achieve healthy backup *ex situ* populations for each species. This is particularly important for Indonesian zoos, as they have a number of founder animals, whose genetics are potentially underrepresented in the Indonesian and global zoo population. GSMP population management working groups have been working with studbook keepers and zoos since 2016 to produce cooperative breeding and transfer recommendations in Indonesia. New recommended births are important steps forward in our goal of maintaining healthy global *ex situ* populations, which is critical to the long-term conservation of the species. The current set of breeding and transfer recommendations was developed in 2022 for anoa, banteng, babirusa and Sumatran tiger. These recommendations have been implemented for the last 12 months and will be updated in six months' time.

The number of proposed recommendations for 2023-24 is 38 breeding recommendations for babirusa, 40 banteng, 17 babirusa, and 37 Sumatran tiger. As a result of these recommendations, three babirusa, three banteng, and two cubs Sumatran tiger have been born (Fig 2). These births help to grow the *ex situ* populations towards the Indonesian National cooperative breeding targets (Table 2). There have been births from approximately 20% of all recommended pairings since 2018. It is therefore important for the GSMP to support zoos to increase the implementation of recommendations so more are completed in future years. For transfer recommendations, three of seven recommendations have already been completed for banteng. The other transfer recommendations are still progressing well with some of the transfer recommendations for anoa, babirusa and banteng already reaching 50% progress (Fig 3). These transfers are really important to increase the number of possible breeding pairs.

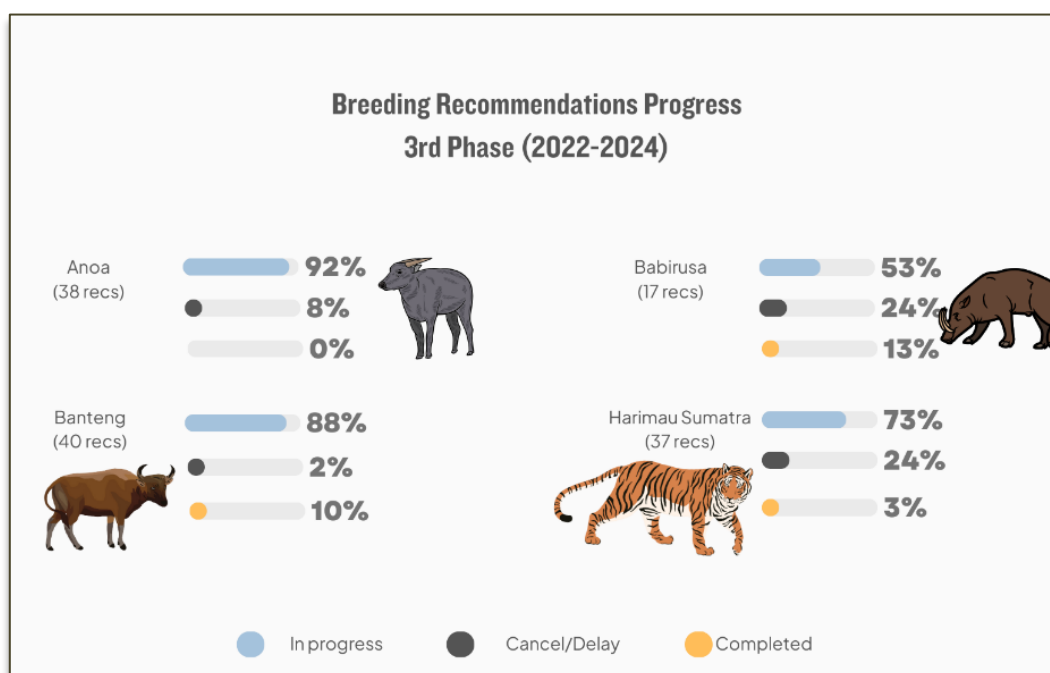


Fig 2: Breeding recommendations progress and births of banteng, babirusa and Sumatran tiger in Indonesian zoos following breeding recommendations.

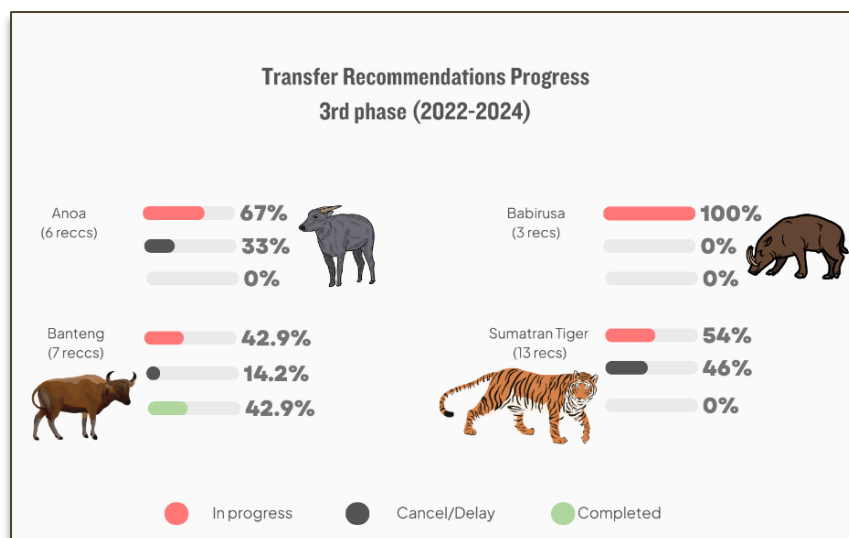


Table 2: Indonesian National *ex situ* cooperative breeding targets and the current *ex situ* populations.

Species	Current population	Target
Banteng	71	100
Anoa	35	75
Babirusa	70	100
Sumatran Tiger	86	140

Fig 3: Transfer recommendations progress and transfer completed following the recommendations.

The next set of breeding and transfer recommendations for 2024-2025 are in preparation with the drafting process beginning in early 2024 for anoa, banteng, babirusa and Sumatran tiger. This process will include opportunities for zoos to engage more in the process through technical discussions online and in person meetings in May and July. At these meetings all zoos can share their population status update and future capacity, and have the opportunity to feedback on draft recommendations.

The agreed recommendations will be sent out to zoos with the support of the Indonesian government in July 2024. Implementation will be supported by measures outlined previously in this report, including through training and increased engagement from all stakeholders, as well as tailored husbandry advice to support successful matings and transfers.

In parallel to the implementation of recommendations, the GSMP is working closely with PKBSI to develop the cooperative breeding approach in Indonesia. This includes discussing improvements to the recommendations process, increasing capacity and raising awareness of the importance of cooperative for successful population management. We are grateful that Merel Zimmerman, coordinator Animal Programmes and Conservation, at the EAZA office met with PKBSI colleagues in December and share EAZA's broad experience to support PKBSI.



Newborn female banteng name Okti with her parent in Bali Safari Marine Park. Photo credits: Bali Safari Marine Park.

Training and visits to support Breeding and Transfer Recommendations for Sumatran tigers

As part of the collaborative effort between the Action Indonesia Global Species Management Plan Husbandry Working Group and the PKBSI Education Division, in October 2023 tiger experts from PKBSI, EAZA and AZA (Ligaya Tumbelaka, PKBSI; Kate Sanders, Zoological Society of London, EAZA; Karen Goodrowe and Erin Pritchard, Point Defiance Zoo & Aquarium and Ivy Brower, Zoo Miami, AZA) conducted a tiger husbandry training workshop in Jakarta. A total of 24 participants from 16 zoos took part in the 2.5 day workshop.

Day one of the workshop was held at the PKBSI offices and included lectures, videos and practical exercises on safety, exhibit design, population management and genetics and reproduction. Day 2 which was held at the Ragunan Zoo, included lectures on nutrition and body condition scoring, enrichment, animal-human relationships and animal training, and the participants had the opportunity to create and deliver enrichments to the tigers at the zoo as well as practicing beginning training skills with the tigers. The third day, also at Ragunan Zoo, focused on record keeping and data analysis of reproductive cycles as a means of predicting estrus. All participants received a number of items related to tiger care to take back to their facilities (body condition scoring sheets, notebooks for record keeping, tongs for feeding, spices for enrichment and clickers for animal training).

At the end of the workshop, a WhatsApp group was developed for PKBSI members to communicate with each other and ask questions about tiger husbandry. Overall, the workshop was well-received, and the participants were very enthusiastic. Favourite topics included learning about the estrous cycle (detection of estrus and introductions) and participating in training sessions with the tigers.

In March and October, tiger experts from PKBSI, EAZA and AZA visited nine Indonesian zoos in Bali, Medan, Sawahlunto, Lembah Hijau, Lamongan, and met with veterinary, curatorial and keeper staff to provide input for ways to enhance basic tiger care and enrichment. The team evaluated holdings and exhibits, diets, body condition scoring, enrichment, records of behaviours and breeding. The team also provided advice on relationship building with the individual animals and shared protocols, advice and experiences with respect to breeding introductions. At each zoo a detailed list of suggestions to enhance care and breeding tailored to the specific facility and individual animals was provided.



Participants and trainers at the Tiger Husbandry Training workshop (left), and a group of participants designing tiger enrichment (right). Credit: PKBSI and Karen Goodrowe

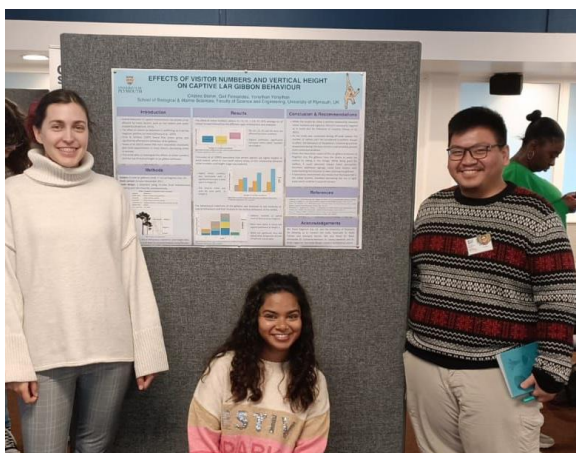
Train the Trainer training

In May, PKBSI and the GSMP Education and Husbandry Training Working Groups jointly delivered a Train the Trainer Workshop to increase the capacity of Indonesian Zoo staff to plan, deliver, and evaluate training. During this four-day course held at the PKBSI Office in Jakarta, 20 Indonesian zoo professionals focused on models of training and developed their skills as trainers. The training was delivered by Ligaya Tumbelaka (IPB), Charlotte Smith and Amy Humphreys (Chester Zoo), and Sam Viner (ZSL). The course was incredibly well received, with all participants delivering their own training and sharing positive feedback on the last day. All participants reported increased confidence and knowledge in delivering future training, with 93% of participants reporting an increase in their skill set. In early 2024 the participants will complete a further evaluation exercise and discuss their use of their training skills in their zoos. This increased expertise in training models is cross functional and will be utilized in future trainings to increase knowledge uptake and efficacy of training.



Participants conducting group work during their Train the Trainer workshop (left) and evaluating the training using the 'Five-Finger Feedback' method (Right). Credit: PKBSI

Increasing the animal welfare assessment capacity of the PKBSI-GSMP Program Officer



Yonathan and his group presenting their poster about lar gibbon behaviour. Credit: Yonathan

From September 2023, PKBSI-GSMP Program Officer, Yonathan, started his master study on ResM Biological Sciences at the University of Plymouth, UK. This capacity building opportunity was supported by the PKBSI (Indonesian Zoos and Aquariums Association), Action Indonesia GSMP, and Chester Zoo to develop his knowledges and skills to support the future works of this collaboration program. He will be supervised by the University of Plymouth (Dr. Joanna Newbolt and Prof. Richard Preziosi) with supervision support from Chester Zoo (Dr. Lisa Holmes, Dr. James Waterman, Dr. Stuart Young, and Corinne Bailey).

His research will focus on the development of animal welfare assessment tool that was initially for anoa and Sumatran tiger. His research will benefit to support the zoos in Indonesia through the provision of assessment tool to evaluate and monitor the animal welfare. The output of the research could potentially support the gap in husbandry management and improve the breeding success for the anoa and Sumatran tiger.

He will be visiting 16 zoos in Indonesia between January to April 2024 to work with the anoa and Sumatran tiger keepers to trial the new welfare assessment tool and gather their perception about animal welfare. While doing the master study, he will be still working for PKBSI and GSMP program with limited time. He aims to finish his study in November 2024 and go back to Indonesia to continue working full time for PKBSI and GSMP.

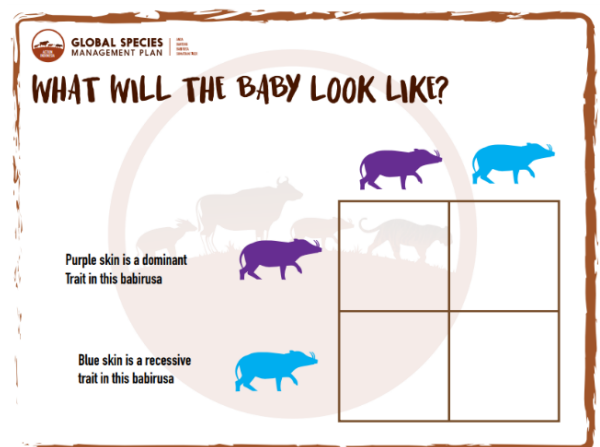
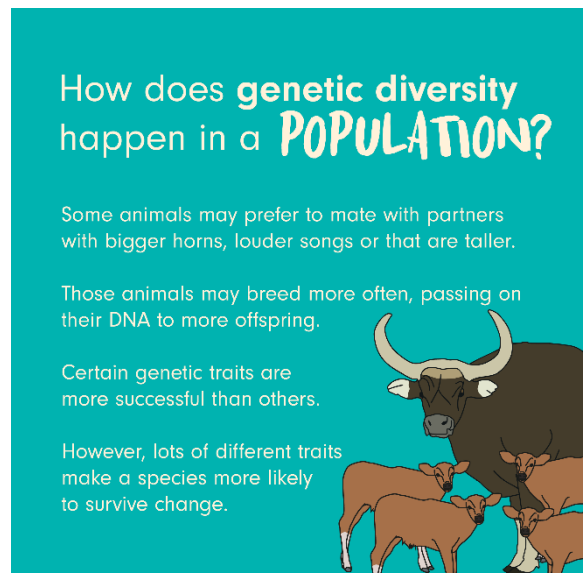
2. Education - Action and support for the conservation of target species

Raising awareness of the importance of genetic diversity in small populations

In 2023, the Education WG and PKBSI raised awareness on the role of zoos in conservation, focusing on their *ex situ* role of maintaining genetic diversity in small populations of the GSMP species. Championing and explaining this role is important for increased understanding and engagement with cooperative breeding in zoos and with the wider public.

The 2023 Action Indonesia Webinar: “The importance of genetic diversity for saving species” was held on the 27th of July. The webinar was hosted by Merel Zimmerman from the EAZA Executive Office, with an expert panel including Dr James Burton, Amy Humphreys, Dr Ligaya Tumbelaka, Dr Christina Hvilsom and Dr John Andrews. Each speaker discussed their role in conserving the GSMP species with a focus on genetic diversity and ensuring diversity in practice. 80 people attended the live webinar, which can be watched on [Youtube here](#).

In addition to this, the Education WG developed engaging content and resources around the importance of genetic diversity to species conservation. This subject is essential to communicate clearly as it underpins much of Action Indonesia’s work *in situ* and *ex situ*.



Resources and games developed to raise awareness and engagement on genetic diversity

Action Indonesia Day 2023

The fifth annual Action Indonesia Day was held on Sunday the 13th of August around the world, with the aim to maximise education efforts and communication about the species and their conservation. This continues to be a major achievement in raising awareness and in the collaboration between regions.

This year, 42 zoos and institutions from Indonesia, Europe and North America participated in Action Indonesia Day. The day was successful in spreading the word in their zoos and on social media about anoa, banteng, babirusa, and Sumatran tigers using the #ActionIndonesiaDay hashtag. Zoos celebrated in person by sharing educational resources including those provided on the Action Indonesia website as well as connecting with their visitors through games, keeper talks, touch tables and more.

In Indonesia, zoos participated through visiting schools to spread the conservation education messages about the species, such as Gembira Loka Zoo, Taman Safari Indonesia Bogor, and Bali Zoo. Other zoos held education activities in the zoos like keeper talks, education corners and colouring competitions, such as Taman Impian Jaya Ancol, Taman Rimbo Jambi, Ragunan Zoo, Bali Safari Park, Solo Safari, Taman Safari Indonesia Prigen, and Surabaya Zoo.

Social media posts using the #ActionIndonesia and #ActionIndonesiaday hashtags reached over 600,000 users over multiple platforms, generating over 10,000 likes, and our website resources were downloaded more than 55 times to help with educating zoo visitors. As a testament to the hard work of the Education WG and PKBSI, the key words of many of the social media posts included 'Genetics; DNA; saving species; and Science'. In person activities have included games and quizzes, colouring activities at keeper tables, fundraising, visitor pledges for conservation and school visits. We are grateful to everyone involved in spreading the word about Action Indonesia



Action Indonesia Day signage at TSI Prigen highlighting the importance of genetic diversity in species conservation.



Colouring competition about the Action Indonesia GSMP species on canvas at Ancol (left) and on bucket hat at Surabaya Zoo (right)



Touch table and education activities at Bali Safari Park (left) and Ragunan Zoo (right)



Tiger enrichment at Zoo Miami with messages on genetic diversity. Credit: Zoo Miami

Conference presentations

Action Indonesia was well represented at conferences this year, with presentations delivered in person, with many more opportunities to discuss collaboration on specific projects and support. The GSMP progress was presented in the below conferences.

- EAZA Annual Meeting, Helsinki, Finland, September
- SEAZA annual conference, Taiping, Malaysia
- AZA mid year meeting, Oklahoma, USA

In the EAZA Annual meeting, the GSMP progress was presented at the Cattle and Camelid TAG as well as the Pigs and Peccaries TAG and the Tiger TAG meetings. We also held a GSMP meeting with over 60 people in attendance, in which each working group was able to update on their plans and have an open, positive discussion.

SEAZA Conference presentation on population management.

On the 5th-9th of November 2023, PKBSI-GSMP Population Management Coordinator, Mia, attended the 31st South East Asian Zoos and Aquariums Association (SEAZA) Conference in Taiping, Malaysia. The conference was attended by 26 countries not only from South East Asia but also from other regions such as Europe, America and Australia. “Keeping Zoos Relevant” was chosen as the theme for the conference with Conservation, Collection Planning, Sustainable Population Management, Education in Zoos, Animal Welfare, Zoos and Wild Animal Medicine, Zoo and Exhibit Design and Husbandry, and Marketing available as six sessions have been prepared for paper and poster presentations.

As part of this opportunity, Mia joined to present a poster presentation with a focus on population management. Her poster title “Cooperative Breeding Efforts for Sustainability of Population Management” aimed to share the importance of cooperative breeding programs in zoos, to increase populations and maintain high genetic diversity. She shared information about the Action Indonesia GSMP Program which supports the implementation of cooperative breeding programme for anoa, babirusa, banteng and Sumatran tiger. She also addressed the process of developing breeding and transfer recommendations by GSMP in PKBSI that has been improved in the last cycle.



Mia with her poster presentation and discussed with one of the participant at SEAZA Conference. Credit: Sufraha Islamia

3. In situ Conservation - Stable and safe *in situ* population

Banteng metapopulation approach

Javan banteng occur in four National Parks (NP) in Java: Alas Purwo, Baluran, Meru Betiri and Ujung Kulon National Parks. A key aim of the banteng *in situ* WG is to support the parks to collect comparable information about the banteng within their parks, to increase understanding of their genetic diversity, population trends, and habitat use in order to move towards a banteng metapopulation approach. This is a concept which allows all the different populations of banteng to be managed as one single population, thus increasing their genetic diversity and resilience.

Following technical calls between these four National Parks in 2022, the GSMP, PKBSI and the Indonesian Ministry of Forestry have been working together with National Parks on population monitoring and genetic biopsy sampling.

Population monitoring:

The GSMPs, PKBSI and Alas Purwo National Park have collaborated since 2019 to monitor banteng populations in a priority location for banteng conservation in East Java. This will allow us to establish how many banteng are in the park, how their population changes over time and the habitats they use. The project is supported by Chester Zoo, Stichting Wildlife Beekse Bergen, Re:wild and Wroclaw Zoo, with the objectives to establish effective monitoring in Alas Purwo National Park, and to support the collation of population data from all four priority areas in Java.

This year, the GSMP supported a third year of camera trapping in Alas Purwo NP. Following two consecutive years of park wide camera trapping, to look at population density and size, in 2023 we focused on a section of the park to study the habitat use of banteng during the dry season, including their occupancy of areas between supplemented and non-supplemented sections of the park, and other variables. Camera traps were deployed between August-October. The results are currently being analysed and results will also assist with park management planning. In partnership with Chester Zoo and the IUCN Asian Songbird Trade Specialist Group, Audio Recording Units were deployed at the same time as the camera traps and will help identify priority bird species occupancy in the surveyed area.

Engagement with the other three NPs continues, with training on Random Encounter Modelling theory delivered to Meru Betiri NP by Dr James Waterman (RedPony Analytics) in April, and visits by WG members to both Meru Betiri and Ujung Kulon NPs in November, which identified next steps in supporting their data collection and analysis. Baluran NP repeated their camera trap data collection in 2023, and it is hoped that we can begin to compare data between parks in 2024.



Camera trap image of banteng. Credit: Alas Purwo National Park

Banteng biopsy sampling:

The Ministry of Forestry and Environment, PKBSI and the GSMP Genetics WG have been working with NPs to collect and analyse genetic data from banteng in each of the parks. By analysing the genetic diversity of the banteng, we can rigorously assess the potential and need to manage banteng in Java as a single population that allows for translocation of banteng between sub-populations and maintain genetic quality within the metapopulation.

Following a technical call between the four parks in January 2023, a workplan and timeline was agreed to collect biopsy samples from approximately 20 individuals from each park between mid-2023 and end 2024, with an initial training in sampling and storing techniques in May.

On the 23-26th of May 2023 technical training was held in Baluran NP, attended by each national park team consisting of four people from each national park who would be taking the samples in the field. The topics presented by the speakers from Copenhagen Zoo and BRIN consisted of training on genetic sample preservation from skulls, tissue sample preservation, hide introduction, practice on using biopsy dart, practice on using dart gun, shooting practice, and discussion of sample transport schemes.

Following the training, Alas Purwo NP has successfully completed biopsy sampling of 20 banteng individuals. Biopsy sampling activities were limited in Meru Betiri NP due to terrain issues; this will be revisited in 2024. The biopsy sampling is currently happening in Baluran NP, with plans to start in Ujung Kulon in early 2024. This is an excellent example of the One Plan Approach, as government, ex situ and in situ stakeholders are working together to promote positive change for this species.



Training National Park staff in skull sampling and sample preparation , and biopsy sampling dart gun training using a portable hide. Credit: PKBSI

Population monitoring of anoa and babirusa in Sulawesi

Anoa and babirusa are threatened by habitat loss and hunting, causing population declines. Accurate population estimates are lacking, however, as there have been no island-wide (or regional) surveys for these species to date, which hinders conservation efforts. In 2022, the Action Indonesia GSMPs and PKBSI worked to develop relationships and plans to establish a population monitoring programme in at least one protected area of Sulawesi. This year, we supported a field team from the Faculty of Forestry, Universitas Hasanuddin (UNHAS) and the Department of Forestry (BBKSDA), South Sulawesi, to carry out a camera trap survey of Faruhumpenai Nature Reserve for anoa and babirusa. The implementation of the camera trapping was carried out by UNHAS alumni and BBKSDA staff. This is the first time the reserve has been camera trapped for these species.

Following a ten-day pilot study in May, where the field team learned more about the terrain, 27 camera traps were deployed in the south-east of the reserve during two weeks in June and July. Each team faced challenges with very difficult terrain, closed habitat and limited water availability, which affected placement of some cameras. Camera traps were collected following 70 days in a process that was also made difficult due to weather and field conditions. We very much appreciate the hard work of the field teams in challenging conditions. Initial examination of the camera trap images show that both anoa and babirusa have been recorded by the camera traps at more than one location.

In early 2024 the GSMP will work together with UNHAS to prepare their data for initial analysis using occupancy modelling. The survey will be repeated in 2024 in another area of the reserve to provide a wider picture of the anoa and babirusa presence and occupancy within the reserve.

The number of anoa and babirusa left in the wild is unknown, so this will be a promising step forward in future monitoring and conservation of both species. By trialling a monitoring method in one area and building relationships with the relevant authorities and partners in Sulawesi, we aim to scale the project up to more areas holding remnant populations. In addition, the GSMP aims to engage with *in situ* NGOs in 2024 to better understand the threats to the species and support capacity building in behaviour change and awareness raising approaches.



Camera trap deployment teams setting up cameras and recording sign presence for anoa and babirusa during the 2023 survey. Credit: UNHAS and BBKSDA Sulawesi Selatan

The project is supported by Toronto Zoo, Nashville Zoo, CERZA, Artis and the Dr Holly Reed Conservation Fund, Point Defiance Zoo and Aquarium. We also appreciate the fundraising to support this project through artist Marcus Burkhardt's continued collaboration.



Camera trap images of anoa and babirusa during the 2023 survey. Credit: UNHAS and BBKSDA Sulawesi Selatan

Outlook for 2024

Successes this year with *in situ* monitoring, genetic sampling and husbandry training have demonstrated our ability to collaborate on ambitious activities using a variety of approaches. We are excited to start implementing more of our plans next year, including but not limited to:

- Continuation of camera trap monitoring for anoa and babirusa in one site in Sulawesi.
- Conduct a programme of husbandry and education training, including an ungulate husbandry workshop and a training in monitoring and evaluation methods.
- Support the development of the 2024 breeding and transfer recommendations for the GSMP species, including an in person workshop with zoos and experts in May.
- Increase capacity of the PKBSI GSMP Programme Officer as he completes an MRes in Animal Welfare.
- Supporting the genetic sampling and population monitoring of banteng in all four parks.

We look forward to the next **Action Indonesia Day on 11th August 2024**. Please check the [GSMP website](#) and social media pages for updates and resources on how to get involved in Action Indonesia Day this year.

We rely on your support, expertise and funding to carry out our activities. If you are interested in getting involved and want to find out more, please contact either James Burton (jamesaburton@yahoo.co.uk) or Corinne Bailey (c.bailey@chesterzoo.org) of the AWCSG, a Working Group leader (see Table 4 Annex) or one of the GSMP convenors or co-convenors:

- Anoa: Convenor: Marcel Alaze; Co-convenor: Yohana Tri Hastuti
- Banteng: Convenor: Ivan Chandra; Co-convenor: JT Svoke
- Babirusa: Convenor: Joe Forys; Co-convenor: Sri Pentawati
- Sumatran tiger: Convenor: Malcolm Fitzpatrick; Co-convenor: Ligaya Tumbelaka

**We wish all partners well for the coming months.
We need your help for the 2024 activities – please get in touch!**

Find us on www.actionindonesiagsmp.org or on social media following the links below:

FIND US ON SOCIAL MEDIA



[@IUCN_WildCattle](#)



[Action Indonesia GSMP](#)
[IUCN Asian Wild Cattle Specialist Group](#)



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Annex: Action Indonesia GSMP founding members, working groups and leaders

The Action Indonesia GSMPs were founded by the Indonesian Zoo and Aquarium Association (PKBSI), the European Association of Zoos and Aquaria (EAZA), the Association of Zoos & Aquariums (AZA), the IUCN Species Survival Commission (SSC), the IUCN SSC Asian Wild Cattle Specialist Group (AWCSG) and the IUCN SSC Wild Pig Specialist Group (WPSG) in 2015. In March 2016, they were endorsed by the Indonesian Ministry of Environment and Forestry (KKH) and WAZA. The Sumatran tiger GSMP is WAZA's longest running GSMP, started in 2008 with the additional partners of the Zoo and Aquarium Association Australasia (ZAA) and the Japanese Association of Zoos and Aquariums (JAZA). Below is the list of the thematic Working Groups and their leaders:

Table 3 Action Indonesia GSMP Working Groups and leaders.

Name	Contact details	Affiliation(s)
Anoa Population Management		
John Andrews	jandrews@lpzoo.org	AZA Population Management Centre, Lincoln Park Zoo, USA
Yohana Tri Hastuti	yohanavet@tamansafari.net	Taman Safari Indonesia, Indonesia
Babirusa Population Management		
Joe Forys	jforys@auduboninstitute.org	Audubon Nature Institute, USA
Sri Pentawati	pipentakbs_94@yahoo.co.id	Surabaya Zoo, Indonesia
Banteng Population Management		
Eko Windarto	manager_education_tsiz@tamansafari.com	Taman Safari Indonesia Prigen, Indonesia
Andrea Putnam	asputnam@gmail.com	
Sumatran Tiger Population Management		
Kathy Traylor-Holzer	kathy@cpsg.org	IUCN SSC Conservation Planning Specialist Group (retired), USA
Ligaya Tumbelaka	tigressgaya@gmail.com	Bogor Agricultural University (IPB), Indonesia
Education		
Charlotte Smith	c.smith@chesterzoo.org	Chester Zoo, UK
M. Piter Kombo	piter_kombo@yahoo.co.id	PKBSI/Jagat Satwa TMII
Fundraising		
James Burton	jamesaburton@yahoo.co.uk	IUCN SSC Asian Wild Cattle Specialist Group, UK
Joe Forys	jforys@auduboninstitute.org	Audubon Nature Institute, USA
Marcel Alaze	alaze@allwetterzoo.de	Allwetterzoo Munster
Genetics		
Gono Semiadi	semiadi@gmail.com	National Research and Innovation Agency, Indonesia
Christina Hvilsom	ch@zoo.dk	Copenhagen Zoo, Denmark
Husbandry Training		
Amy Humphreys	a.humphreys@chesterzoo.org	Chester Zoo, UK
Willem Manansang	willem@tamansafari.com	PKBSI/Taman Safari Indonesia
Anoa and Babirusa <i>in situ</i>		
James Burton	jamesaburton@yahoo.co.uk	IUCN SSC Asian Wild Cattle Specialist Group, UK
Corinne Bailey	c.bailey@chesterzoo.org	IUCN SSC Asian Wild Cattle Specialist Group & Chester Zoo, UK
Banteng <i>in situ</i>		
Carl Traeholt	cat@zoo.dk	Copenhagen Zoo, Denmark
Corinne Bailey	c.bailey@chesterzoo.org	IUCN SSC Asian Wild Cattle Specialist Group & Chester Zoo, UK

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IUCN SSC Asian Wild Cattle Specialist Group (www.asianwildcattle.org)



Contact:

James Burton, Chair of the IUCN SSC Asian Wild Cattle Specialist Group (jamesaburton@yahoo.co.uk)

Thanks to all the Action Indonesia GSMP partners and supporters

