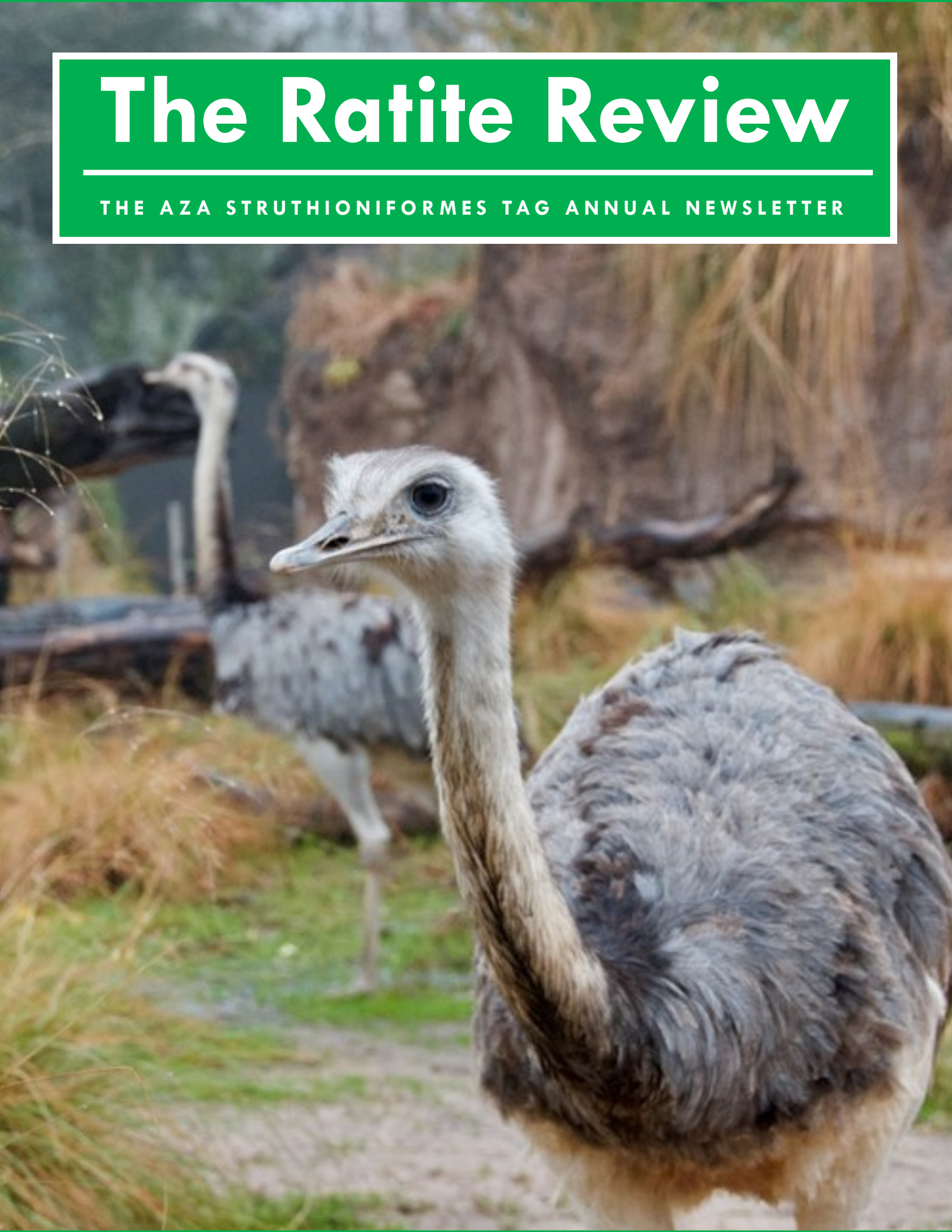
The Ratite Review

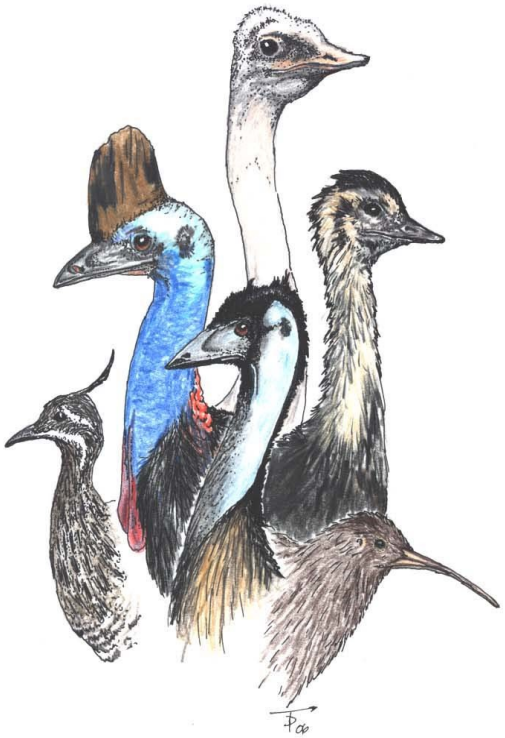
THE AZA STRUTHIONIFORMES TAG ANNUAL NEWSLETTER



THE RATITE REVIEW

Welcome to *The Ratite Review 2021!*

The vision of the Struthioniformes Taxon Advisory Group is to engender appreciation of ratites and tinamous by raising awareness of conservation threats and helping zoo visitors and the zoo community better understand actions they can take to help conserve these species in the wild.



ASSOCIATION OF ZOOS & AQUARIUMS

www.facebook.com/RatiteTAG

Cover Photo: Greater Rhea at Houston Zoo by John Register

Newsletter Editor: Kirby Pitchford

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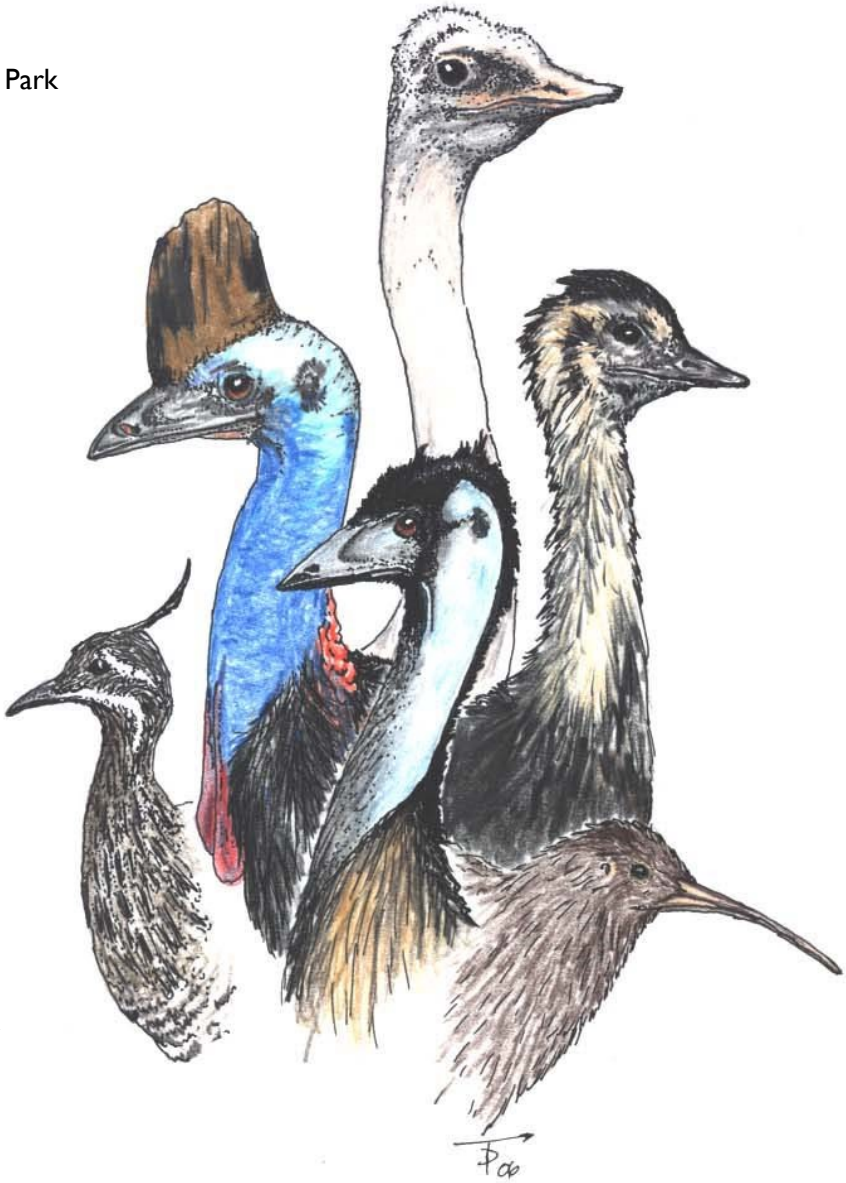

SSP Program Leaders

Brown Kiwi: Kathy Brader, National Zoo
Elegant-crested Tinamou: Kristen Clark, National Zoo
Southern Cassowary: Nicole LaGreco, San Diego Zoo

Species Champions

Emu: Monica Halpin, Zoo Atlanta
Ostrich: Scott Tidmus, Disney's Animal Kingdom
Greater Rhea: Heather Anderson, National Zoo

TAG Updates

The 3rd Edition of the RCP for 2020-2025 has been published and is available on the AZA website. Thank you to all who had a part in creating this document!

The TAG has decided to move greater rheas from SSP to monitored status with continued studbook management and recommendation on sourcing of birds from the current population manager.

We are looking for new steering committee members to reach the ideal capacity of 15! If you are interested, please email Sara.

Above: *Greater rheas at Audubon Zoo. Photo courtesy of Scott Kayser.*

Support the TAG, buy a bag!

Check out our partner Wendy Barnes Design! You can support the TAG by going to *www.wendybarnesdesign.com* and purchasing any ostrich, cassowary, and now KIWI product. 10% of sales on these products will go towards the Struthioniformes Taxon Advisory Group.

This Fall we premiered our new kiwi design!

Follow Us on Facebook!

The Ratite TAG Facebook page has over 1,800 followers. Keep up to date on what's happening with ratites in AZA. Help us grow our community by liking and sharing our posts!

Find us at
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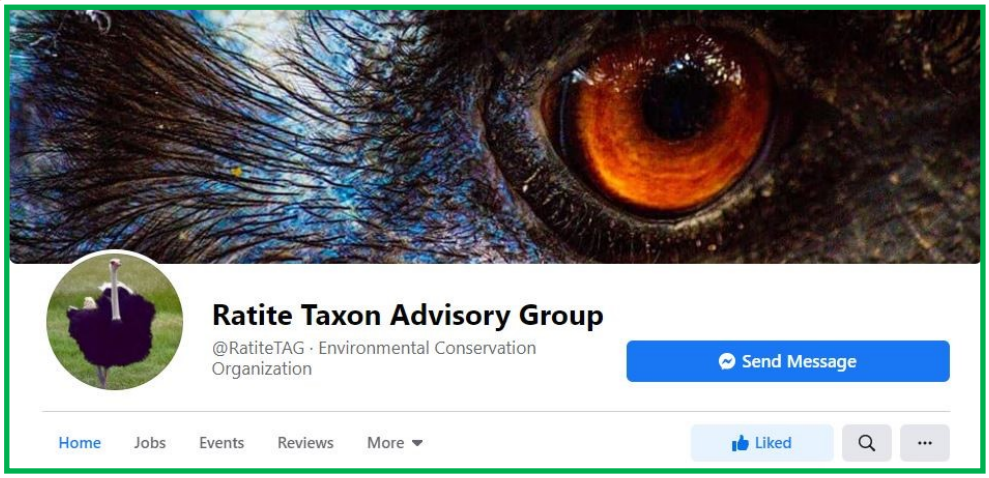


FROM THE CHAIR, UPDATES ON EAZA

Sara Hallager, AZA Struthioniformes TAG Chair, Smithsonian's National Zoological Park

The AZA Struthioniformes TAG extends its sincerest appreciation and thanks to Jo Gregson, former EAZA Ratite TAG Chair, who retired from Paignton Zoo in late 2020. Jo was a friend to all birds and the ratites were no exception. Jo frequently attended AZA midyear and annual meetings and shared her love of all things ratites with us. We wish her all the best in retirement!

Thanks also to Peter Smallbones, also of Paignton Zoo, who unfortunately had to step down as EAZA lesser rhea studbook keeper. Peter championed lesser rhea for many years in EAZA and wrote a great article for the 2017 AZA Struthioniformes TAG newsletter. The EAZA and AZA ratite TAGs have frequently collaborated on projects over the years in a variety of ways to further the conservation and management of this unique group of birds.

WORLD OSTRICH DAY 2021

Kirby Pitchford, Newsletter & Social Media Coordinator National Aquarium

This year's World Ostrich Day looked a bit different than the inaugural once held in 2020. With the COVID-19 pandemic still barring large crowds, many facilities chose to celebrate virtually. Dozens of zoos and AAZK chapters shared their ostriches with us via social media, posting photos, videos, and live keeper chats for their followers to enjoy. A huge thank you goes out to everyone, facilities and individuals alike, who participated and shared the ostrich love with their friends and communities.

World Ostrich Day was created in 2019 by Jade Tinker, a zookeeper in New Zealand who wanted to share her passion for the world's largest bird with everyone. The chosen date is February 2nd, to signify the fact that ostriches are the only birds alive today with only two toes on each foot. With the help of passionate ratite keepers everywhere this event has spread around the world with many zoos in Australia, New Zealand, the United Kingdom, and the United States participating to share their fondness of these spectacular birds—and this was only year two!

Although the pandemic limited the amount of in-person celebrations this year and restricted us almost exclusively to virtual celebrations, we are hopeful that next year things will be better and we will be able to gather with our fellow ratite fans to honor the third annual World Ostrich Day with even more facilities joining in. Go ahead and mark it in your calendars for 2/2/2022!

Above: *'Jack' at Jacksonville Zoo;* ***Left:*** *'Heidi' at Montgomery Zoo. Photos courtesy of Scott Kayser.*

WORLD CASSOWARY DAY 2020

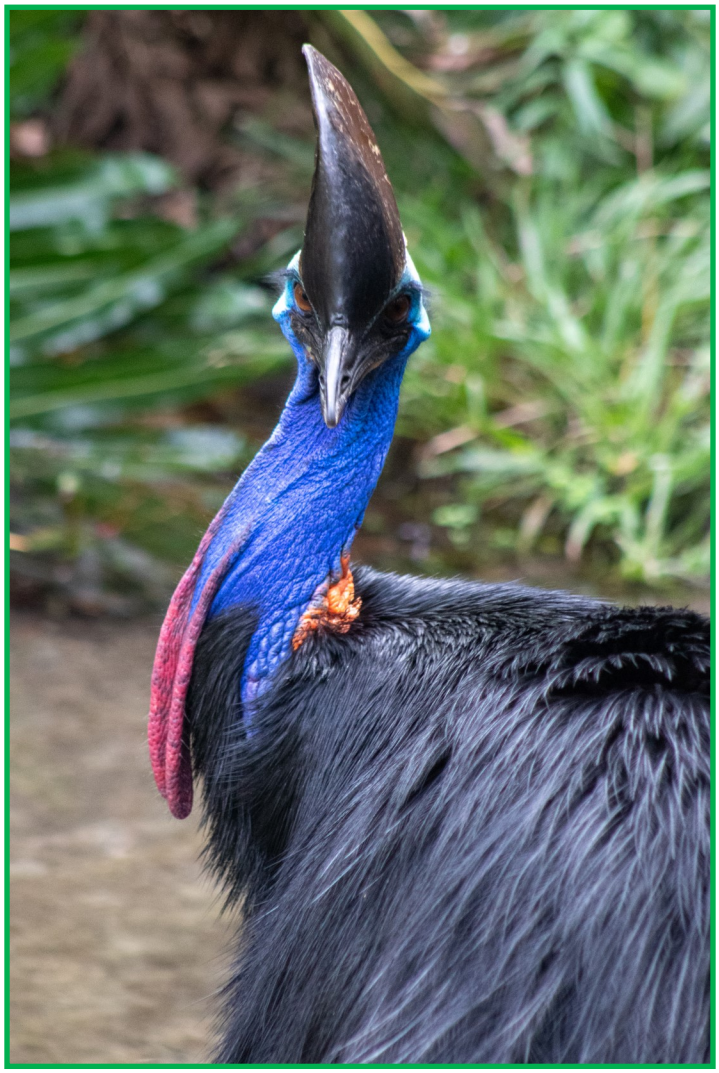
By Larkin Johansen, Jacksonville Zoo and Gardens,

Enrichment Coordinator & World Cassowary Day Liaison

Due to the Covid-19 pandemic World Cassowary Day 2020 looked a little different this year. Instead of coming together for festivals and celebrations, in-person events were cancelled and people were encouraged to spend time in, or give back to, nature.

The Community for Coastal and Cassowary Conservation (C4) in Australia organized a community project to build a nature playground in Mission Beach Arboretum in addition to holding workshops on soil management/improvement, reforestation projects, and a Community Planting Day event at Gurrbum Reserve where more than 200 native trees and plant species were planted. This added to the more than 6,000 trees that have already been planted in the Gurrbum Reserve to form a critical movement corridor for the cassowary and other native species between Japoon National Park, Tully Gorge National Park, and the Walter Hill Range Conservation Park.

Zoological institutions celebrated by taking to the internet: sharing photos, videos, and educational information about the importance of cassowaries on their social media pages. The hashtag #LoveCassowaries and changing profile pictures to include a World Cassowary Day frame were encouraged to engage our guests and promote awareness that cassowaries are vital in maintaining the oldest continuously surviving rainforest in the world: the Wet Tropics.



If you're hiking back and forth in the rainforest way up north

And you see a pile of poo made of berries fruit and goo,

Just be careful and be wary as they're from a bird that's scary.

If you're quiet and rather lucky you might see a cassowary.

Now they're getting rather rare so make sure you drive with care.

They don't have much road sense and their home range is immense;

and it's mainly fruits and seeds on which the cassowary feeds.

In the forests cut by roads in which the careless tourist speeds

their feathers are jet black and hang long upon their back.

And it's tricky to ignore that deadly sharpened inner claw.

Their eyes fill you with dread as does the massive helmet on their head,

but it all amounts to nothing if the cassowary is dead.

All it takes is careful travel when on bitumen or gravel.

Include amongst your chores planting wildlife corridors

and perhaps then when you do you'll see a bird with neck of blue

and the forest will regrow with help from cassowary poo.

-Faunaverse: Australian Wildlife in Poetry, Alexander and Jane Dudley

Program Updates

North Island Brown Kiwi, *Apteryx mantelli*

Yellow SSP

SSP and International Studbook

39.19 at 17 global institutions

SSP Coordinator: Kathy Brader, braderK@si.edu

Yellow SSP

Southern Cassowary, *Casuarius casuarius*

SSP and International Studbook

28.25.1 at 30 U.S. institutions

SSP Coordinator: Nicole LaGreco, NLaGreco@sandiegozoo.org

Red SSP

Elegant-crested Tinamou, *Eudromia elegans*

SSP and Regional Studbook

25.11 at 13 U.S. institutions

SSP Coordinator: Kristen Clark, clarkK@si.edu

Greater Rhea, *Rhea americana*

Monitored

Regional Studbook

27.58.7 at 27 U.S. institutions

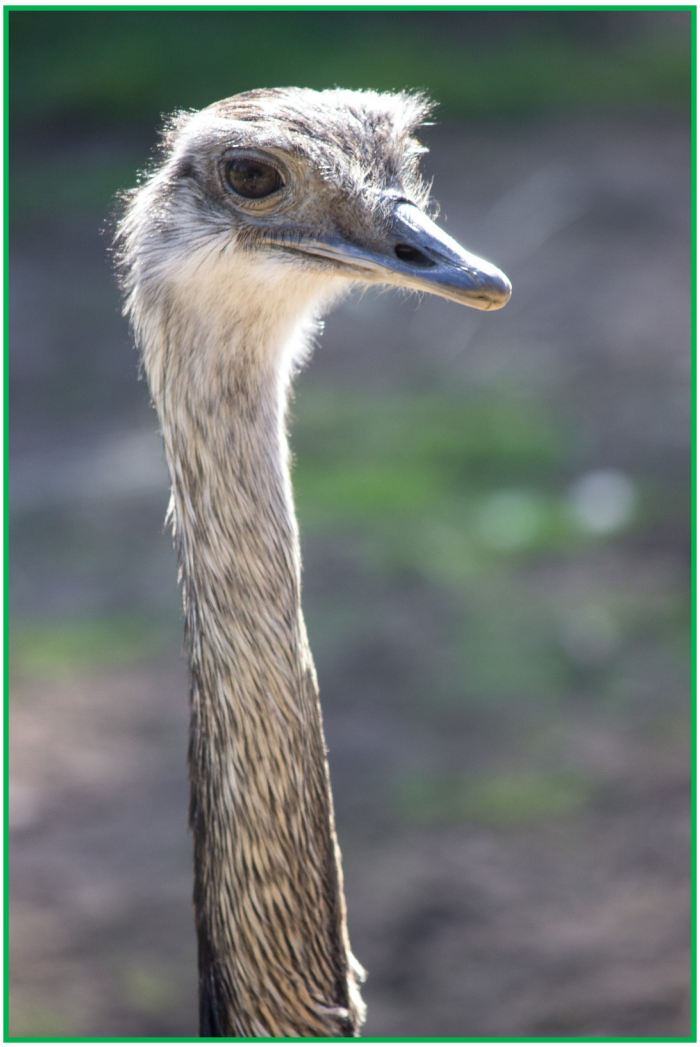
Species Monitor: Heather Anderson, andersonH@si.edu

GREATER RHEA PROGRAM UPDATE

Heather Anderson, Greater Rhea Species Monitor,
Smithsonian's National Zoological Park

The Greater Rhea numbers within AZA continue to be on the decline with an aging population which has led to decreased breeding over the last five years. While we have brought several birds in from outside AZA (private breeder) we would like to have the breeding program numbers within AZA at least replace some of our older adults and maintain the husbandry skills within AZA.

They are a social species so at least two are required to be exhibited together for their well-being. If you would to discuss housing and exhibit recommendations please feel free to email and/or call me at (202) 633-3094; andersonh@si.edu. The Sustainability Report is also available on the AZA website.



They will showcase well in a mixed species exhibit. Houston Zoo's new South America's Pantanal exhibit is an excellent example of how you can use the same exhibit space to showcase several species representing a particular habitat. They chose to exhibit capybara, giant anteaters, Baird's tapirs, coscoroba swans and crested screamers with their rheas. We have other facilities with mixed species rhea exhibits that include: Deer (Fallow and Sika), camel (Wild Bactrian and Dromedary), Emu and other small waterfowl species.

Most zoo guests are aware of ostrich, but many do not know about this beautiful South American ratite species. Let's work together to educate the public about this unique bird!

Left: *Greater rhea at Montgomery Zoo;* ***Above:*** *Greater rhea at San Francisco Zoo. Photos courtesy of Scott Kayser.*

2021 RATITE KEEPER OF THE YEAR

Ana Frace, South America & Australia Keeper, Dickerson Park Zoo

I grew up in Nazareth, PA and always wanted to work with animals, mostly due to my love of the Philadelphia Zoo as a kid. My animal care internships solidified my love of birds. As for ratites, I've gained experience with emu, ostrich, rhea, and my favorite of all favorites-cassowary. I was offered my first permanent keeper position at the Lehigh Valley Zoo in 2017. I later took a bird keeper position in Texas and have since moved into a South America/Australia position at the Dickerson Park Zoo. Here I care for emus and greater rheas among other birds and mammals, but I'm a true bird nerd at heart.

Currently, we have 0.2 emu and 1.1 greater rhea. Rheas were a new species for me and I quickly fell in love with our pair, Oscar and Olive. Both of them are docile but shy, so I decided on a training program to make certain activities less stressful for them. It's been a slow but steady progression over several months, and both rheas now target and shift. Olive has excelled even further and stations on a mat! The next step will be stationing on a scale. This training has required patience and many small steps, but I'm very proud of the progress they've both made. As I continue to train them, I hope to continue establishing new behaviors and to also start incorporating similar training for the emus.

There's a lot to love about ratites, but I think two of my favorite quirks about them are their random "zoomies" and their universal love of grapes. These birds have such a prehistoric quality to them that is both impressive and endearing. My ultimate ratite keeping goal is to once again work with cassowary and to become actively involved in research or conservation projects.

Photos courtesy of Ana Frace.

CASSOWARY CHICK MAKES HISTORY AT NASHVILLE ZOO

By Lauren Covington, Bird Keeper II, Nashville Zoo

March 3rd, 2020 was the first day of introducing our 7 year old male, Wren, and 9 year old female, Marge. This was their first time being introduced together, and by April 11th they had already laid their third egg, which was Neo. Little did we know with having this pair together for the first time, and it being Wren's first time with a female, there would be some fertilization success! Unfortunately, we only had one egg out of the four be a successful chick. There was a possible fertilization in the second clutch a month later but nothing came to from that attempt. Because of threatening storms, we decided to pull the eggs from the first clutch and replace with dummy eggs to protect them from any potential damages that were to occur overnight.

Since the eggs were placed in the incubator at the veterinary hospital on site, we had the advantage to radiograph our eggs and determine which ones were fertile and alive. Egg #3 was the only egg that showed there was a live chick and had good movement. On hatch day, Neo appeared to be getting weak and not able to break out of the shell. With the vet team, bird curator and lead keeper coming together, we were able to save this little chick, which then made history for the Nashville Zoo on June 4th with the official hatch date being June 5th. This is how Neo got her name since she was the only one to survive. Since then, she has made herself an internet sensation due to her spunky personality, kicking everything in sight, randomly rolling on the ground giving all of us a good laugh as we watch her grow into her big personality.

Neo was featured in many news articles, live streams, and interviews throughout the summer and have had many adoring fans fall in love with her. Even though our zoo, like all others, were closed down for quarantine from Covid-19, we were presented with a grand opportunity to breed our Southern Cassowary pair, giving them the privacy they needed to be successful. Neo turns 8 months old on February 5th, weighing at almost 40 pounds, she has graduated to an adult sized Cassowary crate for her near future move to the Cassowary exhibit for all our guests to enjoy her.

KIWI PROGRAM UPDATE AT SMITHSONAIN'S CONSERVATION BIOLOGY INSTITUTE

By Wesley Bailey, Animal Keeper, Smithsonian's Conservation Biology Institute

2020 was a productive year; of the viable eggs laid, two were transferred out and two males were hatched and remain here at SCBI. We also regrettably had a year with an unusually high number of deaths; our well established pair with whom we began the kiwi program died suddenly and unexpectedly, we had our first chick death, and two egg deaths. Still, though, we remain with 8.3: 9 adults and 2 established chicks. We also established a new pair in 2020, bringing us to 3 pairs, though for two of the pairs the reproductive viability remains to be seen. Our research proceeds, encompassing several projects, pending time for some and funding for others.

NEW CASSOWARY CHICKS ARRIVE AT SMITHSONIAN'S NATIONAL ZOOLOGICAL PARK

By Heather Anderson and Gwen Cooper, Animal Keepers, Smithsonian's National Zoological Park

Last fall the National Zoo welcomed two 18 month old male cassowaries from White Oak Conservation, Florida. Prior to their arrival we had shipped out a 26 year old female to San Antonio Zoo as part of the breeding and transfer plan. She had been here since she was just a few months old so she was very set in her ways and a typical casso"wary". These two new juvenile males, named Irwin and Dundee have been together since hatching and are currently housed together here. It is a special treat for our senior keepers and new keepers alike to see the interaction between these two boys. They run around and play with each other which is funny to watch and scary at the same time! We have noticed that they are not as neophobic as our adult had been and seem even curious at times so we are trying to encourage that trait by continuing with training and introducing new things to them. They even come running into their shed for food when we ring a bell, although they have some trouble trying to fit through the door side by side! We are looking forward to caring for these beautiful boys for many years to come!

Left: *Irwin* ***Below:*** *Dundee peeking from around his brother. Photos by Heather Anderson*

IN MEMORIAM: EMIL AT BIRMINGHAM ZOO

Emil, longtime resident of the Birmingham Zoo, was humanely euthanized in September 2020. He was 29 years old and is preceded in death by his brother Cecil, who lived at Zoo Atlanta.

Emil was the first cassowary in the US to be crate trained for voluntary blood draws, weights, radiographs, and injections. His training program and crating behaviors became the framework for other zoos around the country to train their cassowaries for voluntary medical procedures, which meant better welfare for the birds and less stress for keepers and cassowaries alike. Emil was the star of many World Cassowary Day celebrations and was dearly loved by his keepers, vet staff, and zoo educators throughout his life.

Left: *Paul Smith and Cindy Pinger crate training Emil, 2011. Photo by Billy Cochran.* ***Above:*** *Emil as he appeared on the cover of the 2019 Ratite TAG Newsletter. Photo by Scott Kayser.*

Left: *Cecil in his prime, showing off for the camera;* ***Below:*** *Cecil celebrating his 41st hatchday last year, making him the oldest cassowary of known age in the world.*

IN MEMORIAM: CECIL AT ZOO ATLANTA

By Monica Halpin, Lead Keeper, Zoo Atlanta

2020 was hard for all of us for so many reasons. For Zoo Atlanta, this included having to say goodbye to our beloved Cecil. Over the years we've shared many stories with you about the daily life of this quirky old man. Whether it was finding love with his neighboring peahen, refusing to go outside when it snowed, his infamous 'hump bucket,' or the many hatch-day celebrations we threw there was never a day he didn't put a smile on our face. He was always there to greet you when you came through the wooden fence next to his habitat, and was never shy about sharing his displeasure if you took too long with his food. He has left a hole in our department, and if we are lucky enough to house cassowary here at Zoo Atlanta they will have very large shoes to fill!

CASSOWARY TRAINING AT SAN FRANCISCO ZOO

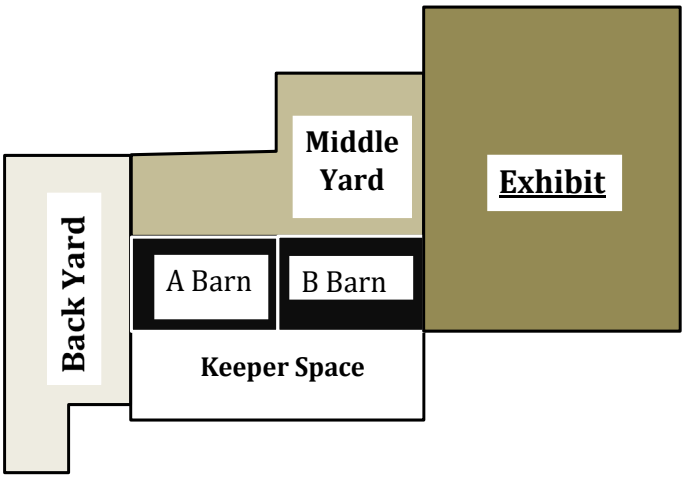
By Dominick Dorsa, Vice President of Animal Care, San Francisco Zoo

At the start of 2020, Bird Keeper Quinn Brown introduced a proposal for a training plan that would give us more options to manage our two cassowary. We currently have one 15 year old male (Daintree) and one 5 year old female (Dollie).

The implementation process began with a meeting with the Director of Training and Behavioral Husbandry to discuss the goals. As with any new training plan or program, we evaluated our starting point and focused on the foundation behaviors we would need. Some of the foundation behaviors were new and needed to be conditioned and some only needed to be reestablished.

Our short-term training goals included reestablishing their recall behavior, targeting, voluntary weights, and achieving more reliable shifting. Our long-term goals introduced in the proposal were to have them voluntarily walk into a crate, as well as allow us to take blood, or give injections.

The training started just before our zoo closed to visitors in March due to the Pandemic. For Covid safety measures, all zoo staffs worked in teams. The two teams were not allowed to work on the same days, which increased workloads and reduced communication and observation options.



While the San Francisco Zoo remained closed, keepers Liz Gibbons, Allison Pizel, and Quinn Brown, were able to continue training and conduct daily training sessions throughout the week. This in itself was an accomplishment. The training has continued and is progressing with both birds.

So far, the results have led to measurable positive behavior change. Both Dollie and Daintree recall and shift reliably. We are able to have them shift from yard to yard through barns multiple times per day. As shown in the diagram, we have three yards and two barns to work with. Barn **A** currently has one feeding window in it and Barn **B** has two feeding windows. These allow us multiple options for shifting, training, and daily management. Their current behavior list includes the following. A clicker Bridge, target, and three different verbal cues for shifting, "inside", "outside", and "shift". These verbal cues communicate to the birds to enter or exit the barn, or to move to the middle yard. We also verbally communicate opening and closing of doors. Both birds have learned to remain calm while trainers change body positions from standing to kneeling for future behaviors. Our male has also been conditioned to two different sprayers for medical treatment. Both birds have been conditioned to follow their trainer along the fence line in multiple locations. Voluntary weights are reliable again during training.

The current training has improved animal and keeper welfare. Better compliance during shifting saves keeper time. The birds receive more enrichment opportunities, and it has improved their relationships with their keepers. All of this contributes to a positive learning environment for trainer and learner.

Of course, not everything went to plan this year, so we had to adapt our original plan and put our facility modifications on hold. We hope in the future to be able to progress to the long-term goals of voluntarily crating, injections, and blood draws.

HUSBANDRY TRAINING OF 0.3 OSTRICH AT DISNEY'S ANIMAL KINGDOM

By Melaina Kincaid, Keeper I,
Disney's Animal Kingdom

At Disney's Animal Kingdom® we have a female ostrich, "Rizzo" with chronic lameness issues as well as a female, "Fozzie" with low body weight and body condition score. Our training program has allowed us to get voluntary medical behaviors in order to evaluate and treat their conditions and care for them more effectively.

We began the ostrich training program by relationship building and allowing the birds to simply be comfortable with keeper presence. We tested several food items to determine what was more reinforcing for them. We determined that soybeans and apple were their preferred items and worked with our nutritionist to determine an appropriate amount.

Voluntary blood draw from wing. Photo taken in off-exhibit holding area.

Once the ostrich were comfortable with keeper presence we began working on body tactile desensitization, focusing mainly on the chest, wings, hips and legs. These foundational behaviors allow us to do body condition scoring, gain access to veins for blood draws and have access to the legs, hips and abdomen for radiographs. The birds each had different levels of comfort for tactile behaviors and keepers were mindful of not advancing to quickly with those more cautious birds.

Once the birds were comfortable with body tactile in all the of the focus areas, we advanced to blood draw training. With advice from our veterinary staff we focused on drawing blood from the wing. We incorporated a third keeper for training during this time as well in order to make the addition of a veterinary technician less of a distraction. A keeper would hold out the wing while a second keeper would use a blunt needle to press against the desired vein. We worked towards holding the needle in this position for 30-60 second time-frame. Next we also held off the vein after the needle to prepare them for a full blood draw. The final step before a blood draw was desensitizing them to the veterinary technician. We have been able to successfully draw blood on all 3 ostrich to date and continue to keep the behavior maintenance for future blood draws.

We have also trained the ostrich for voluntary radiographs. To desensitize them to the radiograph equipment we created a mock radiograph machine using an old tool box and stick on press light, an extension pole with a mock radiograph plate and a wood and plexiglass plate holder as well as the lead apron and mitt. This training requires 3 keepers, 1 to reinforce the ostrich, one to hold the plate or extension pole and one to hold the mock machine. Keepers move the mock equipment around different areas of the body while the reinforcer bridges and reinforces. We have successfully radiographed the abdomen of all 3 birds and feel confident about being able to radiograph other areas of the body as needed.

Due to the lameness Rizzo has experienced we have used cold laser therapy as a treatment for her. This requires a probe to be moved back and forth over the affected area for a total of 7 minutes. With the previous training we had established as well as Rizzo's temperament we felt comfortable trying this with no additional training preparations. The treatment required a keeper to hold the wing outward while a vet tech provided the treatment to the hip and a second keeper reinforced Rizzo. The treatments were successfully executed and appeared to benefit her lameness condition. Thanks to her early participation in this treatment we have been able to phase out this therapy and decrease her oral medication.

Above: *Voluntary radiographs of abdomen.* ***Below:*** *Voluntary treatment with cold laser therapy on hip. Photo staken in off-exhibit holding area.*

Our trained behaviors to date are tactiles, blood draws, injections, radiographs, A to B's, scale and application of topical medications. Going forward we hope to expand our training program and add ultrasounds and stationing to our list of behaviors.

As a safety note it should be mentioned that we require 2 trained keepers when working free contact with the ostrich and the presence of an animal restraint Y-pole. The Y-pole is present during training but is not used. It is a safety tool that can be used if a bird becomes aggressive and needs to be redirected away from a keeper or a shield to get the keepers to a safe space. Keepers are careful to always position themselves on the side of the bird rather than in front of it and we always have multiple exits available.

Training has allowed us to medically monitor and care for our ostrich without having to chemically immobilize them or use physical force to restrain them. This has created less stress and is safer for the ostrich as well as the keepers and veterinary staff. Finding the right reinforcement as well as having patience and allowing the ostrich to each get comfortable at their own pace has allowed us to develop a successful training program.

HOUSTON ZOO'S PANTANAL

By John Register, Assistant Curator of Large Mammals,

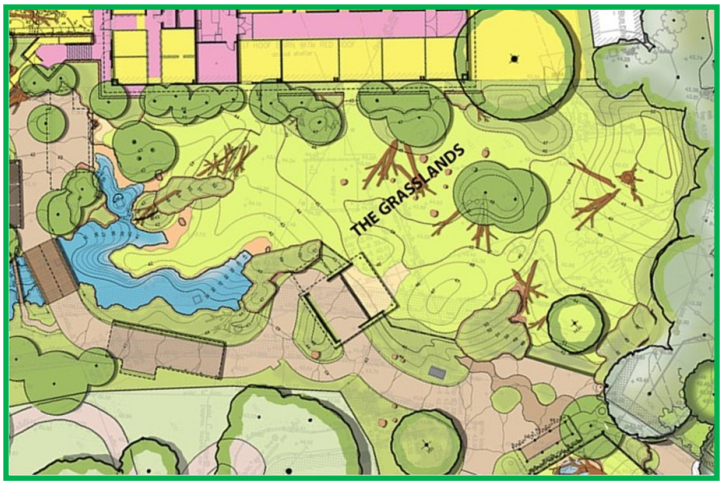
Houston Zoo

In October 2020, after two years of construction, the Houston Zoo opened its most recent experience, South America's Pantanal. This new space pays tribute to The Pantanal which spans Brazil, Bolivia and Paraguay and is home to South America's greatest concentration of wildlife. The Houston Zoo created this new space which allows guests to explore the legendary tropical wetlands of Brazil right here in Houston. And just by visiting the Houston Zoo they are helping to save animals in South America.

The Pantanal's diverse habitats support some of South America's most amazing animals. Within the Pantanal experience is an expansive flooded grassland home to multiple species including Baird's tapirs, giant anteaters, capybara, coscoroba swans, crested screamers, and of course greater rhea.

Currently the Houston Zoo has 1.4 Greater Rhea in this grassland habitat. They are the most visible inhabitants and seem to be a favorite among our visitors. The rhea spend most of their day foraging throughout the entire exhibit which includes a large sand bed next to a public viewing window. This unique vantage point allows visitors to watch the rhea dust bathe up close. If you look close enough you can even see the different animal tracks in the sand. (*Next page*)

In developing a mixed species habitat, care must be taken to ensure that all inhabitants can safely and comfortably coexist. So, for several weeks leading up to the grand opening we worked on introducing all the species with each other and to the habitat. The process was straight forward with all combinations accounted for to put us in the best position for success.

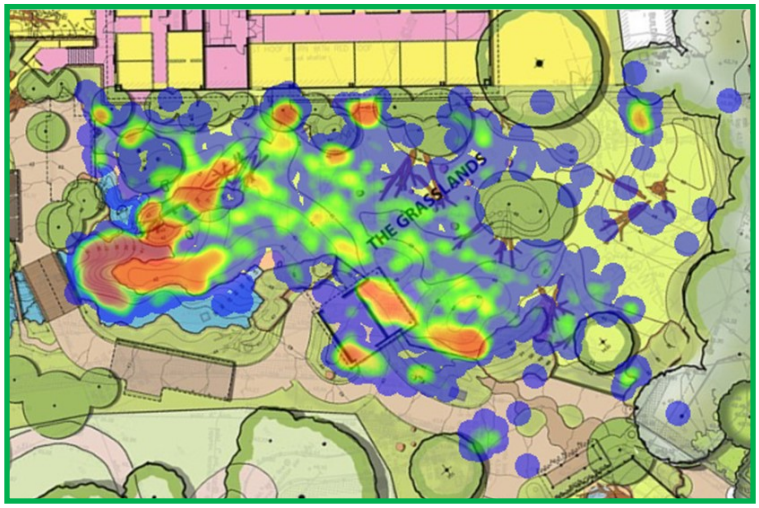


Above: *exhibit signage;* ***Top right:*** *arial view of the grasslands habitat;* ***Middle right:*** *architect drawing of habitat;* ***Bottom right:*** *rheas on exhibit. Photos courtesy of John Register.*

Now throughout the day you can see the rhea along-side several other species including tapir, giant anteater, capybara, coscoroba swans, and crested screamers.

While the swans and screamers have staked out their favorite places within the exhibit, the rhea feel free to explore the entire exhibit including the swans and screamers favorite places.

We have been monitoring how all the animals have been using the habitat space. This is a heat map showing how specifically the rhea use the exhibit. As you can see, they are using the entire habitat. We have found that they have a few spots that they prefer, such as the sandy area in front of the visitor glass and the area near the pool where the screamers and swans also spend their time.



By bringing the Pantanal experience to Houston, guests can explore this tropical wetland and witness how multiple species can coexist in their natural habitat. It is exciting to see so many species living together in a natural habitat allowing guests to gain an appreciation for the amazing rhea.

Are you opening a **new exhibit**?

Do you want to show us your advancements in **husbandry** or **training**?

Feature your contribution to **field conservation**?

Highlight your **successful hatches**?

It's never too early to submit your article for the 2022 edition of *The Ratite Review*!

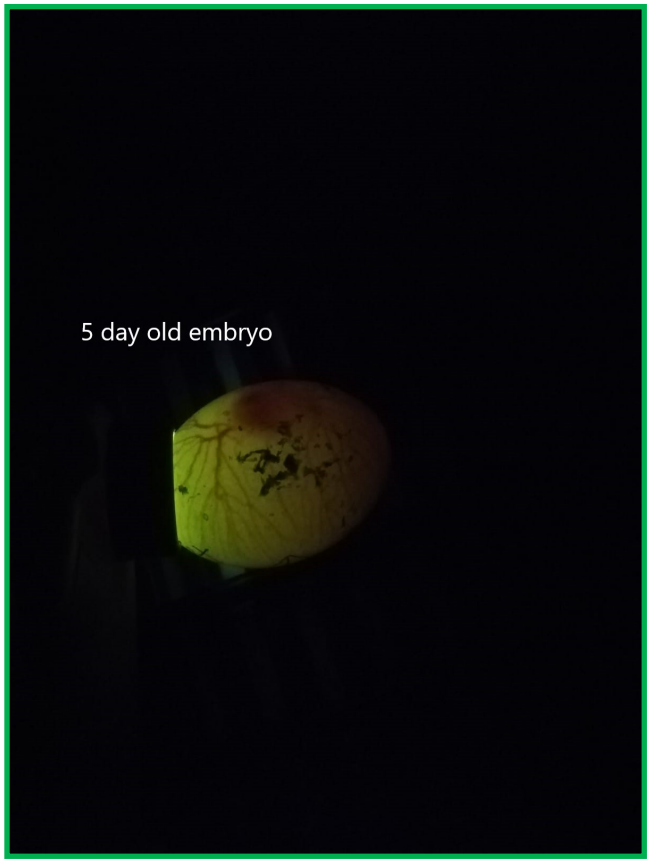
Experiences with Elegant Crested Tinamou at Chester Zoo, UK.

Artificial incubation, hand-rearing, and parent rearing

By Amy Vercoe, Lead Keeper, Chester Zoo

Elegant Crested Tinamou (*Eudromia elegans*) are found in Southern Chile and central Argentina; in lowland dry shrub land, farm land and also in some higher elevations around 2,500m. They are on average 39 to 41cm in length, cryptic coloured and dark or yellow brown with short tail and wings. They have two white stripes on each side of the face and a thin, dark, elongated crest with an upward pointed tip. Belonging to the family Tinamidae, they are Ratites, though unlike other Ratites they can fly. This flight is often directly upwards when startled, to evade predators. Their feet have no hind toes and they never perch, their blue-grey legs are short and strong, as they are highly terrestrial. The wild diet consists of seeds, leaves, fruit and insects, with far more insect matter consumed during the summer. This species of tinamou flocks regularly, especially in winter.

Nesting occurs on the ground, using a simple scrape created by the male. He incubates the eggs and rears the chicks alone, often these are from eggs laid by several females. The chicks hatch covered in down and are precocial, leaving the nest almost immediately.



Eggs laid by Tinamidae are well documented as being incredibly beautiful, with a wide range of colours from dark brown and purple through to turquoise, green, and yellow. The Elegant Crested Tinamou lay eggs that are a deep, rich green with no marks or pattern whatsoever. They are glossy and smooth and look almost unnatural, since most birds' eggs have either visible pores or a rough surface, sometimes both. A recent paper has identified two novel pigments found in eggs of Tinamidae, which helps explain some of the more unusual colours displayed[1]. There are some theories regarding the benefits of such colourful eggshell. It is possible that it may attract and encourage females to add eggs to an existing nest, which may drive the male to begin incubation, lowering the risk of predation. It may also aid the female in identifying and avoiding older nests, since the pigments found in Tinamou eggs have been shown to degrade quickly with exposure to light[1].

As of 31 January 2021, there are 26.20.8 individuals in eight EAZA institutions, and they are classified as Least Concern on the IUCN red list.

In November 2018, a group of six young Elegant Crested Tinamou joined the collection from a zoo in the Netherlands, aged two to four months. Their adult diet consists of turkey pellet, Red Band Conditioner grain for pigeons and doves, chopped kale and cos (Romaine) lettuce, oyster shell grit and nutrobal as a vitamin and mineral supplement (see Table 2. below). Initially they were housed with a breeding group of four Ecuadorian Amazons (*Amazona lilacina*). The medium sized enclosure provided both heated inside (2.5x4.5m) and planted outside (8x4.5m) aviary space with sand and gravel substrate. Some inside green cover for refuge and nesting was provided after a few weeks as the Tinamou would not go outside. The following July they begin to lay, aged between seven and nine months. The eggs were incubated only sporadically as the aviary was not perfectly suited to breeding, and often the eggs were scattered out of nests. At this point fertility was inconclusive, and no success was seen. Two birds were euthanased during this period due to head trauma and suspected aggression within the group. They displayed a very distinctive tilt to the head, which developed into uncontrolled spinning when under stress. This left 3.1 individuals.

In February 2020, the group was moved to a larger aviary with inside and outside provision, sharing with 1.1 Blue-throated Macaw (*Ara glaucogularis*), more detail about this enclosure can be found below when discussing Parent Rearing. After a few weeks they were given access outside and staff encouraged them out daily, while they were adjusting to their new environment. Just before the move, 2 fresh eggs had been stored for artificial incubation and a further 3 eggs were laid soon after moving – these were all set in an incubator leading to our first successful hand-rearing of the species.

	Average	Range
Weight	39.79g	34.0g - 44.87g
Length	51.99mm	49.0 - 54.72mm
Breadth	37.80mm	36.21 - 39.29mm

Biometric measurements from 23 eggs

Hand-rearing

In March 2020, five eggs were successfully hatched after a period of 18-19 days (one egg on day 18, 4 on day 19). They were incubated using a Brinsea Ovaeasy 190, at an average of 37.5°C (range of 37.0-37.8°C) and in a dry incubator averaging 34.5%RH (range of 23-47%RH). They were turned hourly by the incubator and 3x daily by hand. Weight at hatch varied from 27.9g up to 33.9g losing an average of 5.7g during hatch (shell and membranes).

Once fully dry, after approximately 3 or 4 hours, they were moved directly to an inside area within the enclosure used by the adults. This is unusual practice, but it was felt they would thrive better in a more natural environment with access to beneficial environmental microorganisms. Communication from other collections with some experience parenting rearing this species, indicated that chicks frequently consume fresh faeces and it is thought that it may contribute to a healthy gut microbiota, vital for their development and long-term health. It also meant they would be able to see the adult birds when they chose to come inside, which may help prevent the chicks becoming imprinted.

An area of approximately 1m^2 was created using 12mmx25mm mesh to separate the chicks from the adult birds. The floor was lined with an easy to clean, low-pile product called Flotex made by Forbo. A soft shade cloth was used to provide cover and contain the chicks as they became flighted. No access to inedible items was allowed, as it is known from other collections that compaction of the gut has been found on several PM's following death. A 250-watt ceramic heat lamp was suspended about 46-60cm from the ground, ostrich feather dusters were provided nearby for cover, and this provided a temperature of approximately 28°C under the lamp, and an ambient temperature (18-20°C) elsewhere in their enclosure. Food and water were offered in small shallow dishes, with the water dish full of marbles. This gives access for drinking but prevents chicks becoming saturated. Once they were well established a small poultry drinker was used.

They were offered moistened chick crumb immediately but did not move from the heat lamp for the first 4-6 hours while they were adjusting to the aviary and gaining strength. Compared with some other precocial species, they were found to be easy to start, eating well once they had been encouraged to approach the food dish. Their early diet was made up of poultry chick crumb, finely chopped cos lettuce and kale, and a pinch of Avipro probiotic. Further details of the diet are outlined in Table 2. on the next page.

Below: *HR Simple set-up within parent enclosure, shade-cloth cover added after.* ***Bottom:*** *HR set up ready to receive chicks*

Day 1	Avipro added to diet. All eating by 1300. Fed moistened chick crumb and finely chopped greens.
Day 10	Nutrobal added to diet, tiny pinch.
Day 13	Fine oyster shell grit and one spray of fresh green millet was offered, no interest.
Day 14	A spray of fresh red panicum millet was offered. Interested, some eaten. Pinch of foreign finch added to diet. Diet is still ~50% greens, and ~50% moistened chick crumb.
Day 30	Red Band grain added to their diet – approximately 3ml per day. Foreign finch increased to approx. 10ml per day. They receive ~100g of chopped greens and a small amount of avipro plus and nutrobal daily. Fresh red panicum sprays offered regularly as both food and enrichment and is very well received.
Day 37	All sp. started showing preference for small grains, along with the chopped greens (kale/cos lettuce/celery/chard).
Day 70	~40g chopped mixed greens (celery/broccoli/kale/wild greens such as dandelion and dock leaf). 20g foreign finch. 20g red band. 15g dry chick crumb with water added to moisten. 2g fine oyster-shell grit. 0.5g Avipro. 0.1g Nutrobal. Half this amount given AM, and half given PM.
Adult diet	25ml turkey pellet, 25ml Red Band, 40g chopped kale, celery, romaine, apple mixture, nutrobal, grit, 5g sprouted pulses

Table 2. *Diet changes noted throughout rearing period. Amounts per single specimen.*

Two problems encountered during rearing will be discussed briefly:

Angel wing became apparent at day 6, the day after live food was introduced (buffalo worms, *Alphitobius diaperinus*). While this may have been the cause, it is more likely that this was already underway, caused by chick crumb being given ad lib instead of as an addition to the green food. The wings were taped using microporous tape for support, and by day 19 this was resolved as the primaries had almost fully emerged from pin and were no longer heavy.

From day 7, some specimens with more developed primaries in pin were being singled out by others pecking at the pins and taking the blood. As the wings required taping it was possible to cover the developing feathers and protect from further damage. A similar behaviour was noted much later on at day 44 when one specimen developed a small area of bare skin in the centre of the upper back, between the wings, presumably caused by one or both of the other chicks pulling feathers as they moved away. Later, on day 66 a single specimen was suspected to be picking the tail coverts of the others as one was in perfect feather condition and two had some bloody feathers and bare skin visible in the area above the tail.

The chicks were given a larger area, ~3m^2 after 3 weeks and adjusted well. The Flotex remained throughout rearing but at 63 days of age they were exposed to the easibed (woodchip)substrate of the adjacent enclosure. No adverse effects were noted, no attempts to eat it were seen. At day 66 they had one wing clipped to limit injuries later on and feet were cleaned and inspected. The skin was in good condition despite needing frequent cleaning throughout the rearing period. Split metal rings in size T (9mm) were fitted at day 72 and they were given access outside at 87 days of age. This delay was due to some aggression through the mesh from the breeding female towards them. Once they were given access, there was some mild aggression noted but it was not prolonged. Unfortunately, one of these juveniles sustained a serious injury to the upper mandible just 10 days later, and it was euthanised due to the severity. It is not fully understood how the injury occurred.

Parent-rearing

The enclosure in which parent rearing was successful has a small heated inside area (1.5x2.5m) and large planted outside aviary (14x5m) with large windows for public viewing, sand and gravel as substrate plus a pond with waterfall. In May, one male began sitting in a scrape outside under some low cover, directly opposite the viewing windows. It was noticed that eggs were being added to the nest every other day, making up a clutch of 6 eggs; the male appeared to begin sitting following the fifth egg, and they hatched 23-24 days after this. At hatch, the weather became very wet and one chick broke out a day before the others. It left the nest on the same day and was discovered weak and cold. This chick, one wet hatchling plus 2 pipping eggs were taken to a brooder and hatcher respectively, for monitoring. Two dry chicks remained at the enclosure and were moved with the male inside to the rearing area. This was set up in same way for hand rearing several weeks earlier. The weak chick was returned to the male later the same day, and the following day the remaining eggs had hatched, and three more chicks were returned. He brooded them well, encouraging them to eat and it was noted that the chicks would rush to consume fresh broody faeces when it was produced, reinforcing similar observations mentioned above. The chick that had been found cold did not survive.

The same problem with angel wing was encountered with the parent reared chicks. On day 8, it was noted in one specimen and in two others the following day. At day 13, low protein Lundi-micro was introduced, and chick crumb was removed from the diet in an attempt to correct the growth rate. On day 21 the supportive tape was removed, and the wings were being held normally the following day. On day 44 the chicks were caught and had their wings clipped for safety, before being given access outside five days later. No problems were noted when introducing them to the group and we currently have a healthy group of eleven birds: four adults, two hand-reared and five parent reared chicks.

It is worth noting that intervention was not planned for the parent reared birds. If the weather had been dry when these chicks were hatching, we would have left them in the aviary with the group of adults. However, controlled parent-rearing in this way has proven to be a successful method, causing little stress and maximising our output. Now, with our first successful breeding season behind us, it has given us some confidence in the way we manage this species, but will almost certainly mean that we can learn more about their unusual needs and adjust our methods in the coming months.

References

1. Hamchand, R., Hanley, D., Prum, R.O. et al. Expanding the eggshell colour gamut: uroerythrin and bilirubin from tinamou (Tinamidae) eggshells. Sci Rep 10, 11264 (2020). https://doi.org/10.1038/s41598-020-68070-7

Food stuffs and products mentioned in the text.

Avipro
https://www.vetark.co.uk/Shop/Wildlife/Health/AVIPRO-AVIAN/

Easibed
https://easibedding.co.uk/easibed/

Forbo (Flotex)
https://www.forbo.com/flooring/en-uk/commercial-products/flotex-flocked-flooring/ctbual

Foreign Finch
https://www.millbryhill.co.uk/pets-c6/johnston-jeff-foreign-finch-seed-p14717/s51737?utm_source=google&utm_medium=cpc&utm_term=johnston-amp-jeff-foreign-finch-seed-size-20-kg-size-20-kg-5031871007312&utm_campaign=product%2Blisting%2Bads&cid=GBP&gclid=EAIaIQobChMIw_yZp9S_7glVGLLtCh2rPgMoEAQYAyABEgKMBPD_BwE

Lundi-micro (low protein)
https://translate.google.com/translate?hl=en&sl=de&u=https://www.lundi-germany.de/lundi-micro.html&prev=search&pto=aue

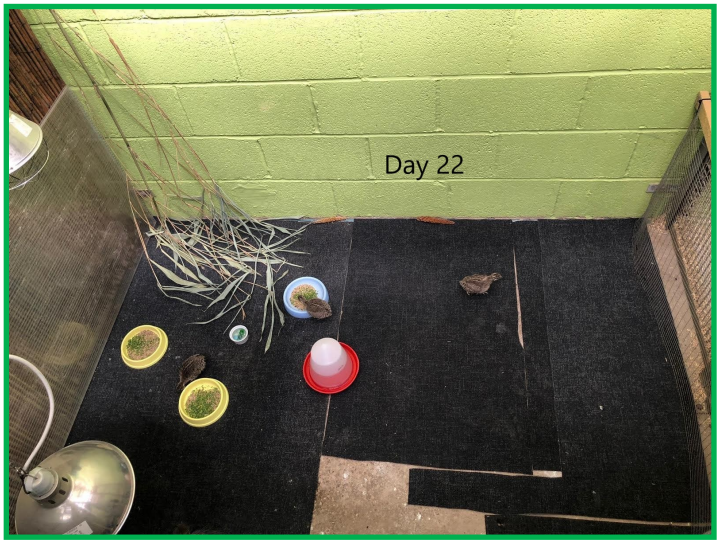
Nutrobal
https://www.vetark.co.uk/shop/cage-and-aviary-birds/supplements/nutrobal/

Red Band Conditioning grain
https://www.haiths.com/cage-and-aviary-bird-seed/red-band-pigeon-conditioner-casm01034/

Turkey finisher pellets
https://www.burnhills.com/small-holder-c8/poultry-c17/poultry-food-c117/massey-turkey-finisher-pellets-25kg-turkey-feed-p3684/s13074?cid=GBP

With thanks to Sophie Bissaker for providing photographs

Right: *HR day 1, ready to move from hatcher*



Clockwise from top left: *hand-reared chicks day 3; day 8; day 22; day 41; parent-reared first nesting first attempt; day 12.*

NEXT STEP FOR NORTH AFRICAN OSTRICH

By John Watkin, CEO,
Sahara Conservation Fund

As a reminder, the goal of the North African Ostrich Recovery Project is to produce enough birds at its breeding facility in Kelle, Niger, to begin returning small numbers of ostrich safely to the wild. As one of SCF's first conservation projects undertaken in the Sahara-Sahel region, it is fully part of our DNA, but also one of its most challenging projects. However, with the oryx project in Chad entering its second phase and welcoming new animals including the North African Ostrich, SCF is now extremely well-placed to capitalize on lessons learnt and begin the reintroduction of the species. Our Nigerian partners from the Gadabeji Biosphere Reserve are about to receive training and a first batch of ostrich chicks to be eventually released in the reserve once grown up. We are finally getting there.

Despite the North African Ostrich being the world's largest bird, one that is particularly well adapted to arid conditions, the eggs and especially the young chicks are extremely fragile and sensitive to diet. Rearing the birds by both captive breeding and artificial incubation has taken the SCF team a considerable amount of time, energy and heartache. Many times over the past 10 years the team in Niger, led by the tireless efforts of Maimounatou Ibrahim Mamadou, has had to overcome major setbacks with eggs failing to develop, chicks not hatching, and young chicks failing to survive the first few days or weeks. Despite these hindrances and in the spirit of research, nothing is wasted if we can learn from the experience. And learn we have. With the assistance of many partners*, SCF has developed a suitable diet from locally-sourced ingredients that provides the correct balance of energy, vitamins and minerals vital for the optimum development of the chicks' feet and legs. It is also safer for all concerned to translocate the chicks when they are less than three months old, raising them in suitable enclosures near the site where they are to be released when they are able to defend themselves - approximately 18-months old. The teams in the field are also mindful of trying to diminish the association of people with food and water, reducing contact over time. In so doing, it is hoped that the released individuals will have a healthy disregard for people they encounter in the landscape. Taking all these lessons together, SCF is on the cusp of shifting from a captive breeding project to undertaking the reintroduction of this enigmatic species. Already there are 11 ten-month old individuals in the Ouadi Rimé-Ouadi Achim Game Reserve in Chad. These will be released in 2021. In Niger, through SCF's collaboration with the government, we hope to translocate a first batch of North African ostrich chicks to Gadabeji Biosphere Reserve, where they will be raised and eventually released. This will restore a species that has not been seen in this landscape in over 50 years. *SCF would like to acknowledge all our partners who have assisted in building the North African ostrich program, including the many donors to the AZA Ratite TAG Adoptan-Ostrich campaign, Disney Conservation Fund, NGO CERNK, Niger Wildlife Service, Saint Louis Zoo, San Diego Zoo Global, Smithsonian National Zoo, and the Solar Energy Team of the Wildlife Conservation Network. Thank you all.

Photos above © Maimounatou Ibrahim Mamadou

Rewilding Patagonia - News in the Conservation and Recovery of Darwin's Rhea (*Rhea pennata*) in Patagonia National Park, Chile

Saucedo C.[1], A. Saavedra [1], P. Herrera[2] & M. Cayún[1]
Patagonia National Park, Tompkins Conservation.
cristian@tompkinsconservation.org,
2 University Austral of Chile, Patagonia Campus

We are moving forward with the sixth season of Darwin's rheas breeding! We will share some of the news as we have already done on other issues of the Ratite newsletter with the learning about Rewilding and management with this species in the Rhea Recovery and Conservation program of the Patagonia National Park, Chile - South America.

For the 2020 breeding season, the first chicks to hatch from natural incubation began in November. We added chicks from artificially incubated eggs from a large and healthy wild population of more than 300 rheas of a private ranch. This management action on wild nests was possible thanks to the authorization of the Wildlife and Livestock Service of Chile (SAG) dependent of the Ministry of Agriculture and the commitment of private ranch managers.

At this time, we have 16 new chicks which are in the breeding unit under the careful care of 2 males. Additionally, for first time we received the contribution of 11 chicks donated by Quimán Reserve breeding center located 800 km further north of Patagonia National Park. These chicks were transported by a STOL plane covering 800 km with a 5 hours flight duration.

This collaborative work will allow not only to increase the number of juvenile rheas but diverse genes to the wild population each season.

Release of rheas into the wild began in 2017 and to date 38 rheas were managed from the breeding center to the wild population. This autumn, thanks to the collaboration with Quimán Reserve, for the first time we will be able to release more than 20 young rheas of 6 months of age at the end of an annual breeding season.

When the program began in 2014, the censuses estimated less than 20 birds living in the wild, being exposed to a high risk of local extinction due to their reduced population, lack of connectivity and isolation with other native population. In 2016 the frequency of sightings in both and adult rhea individuals and groups of chicks began to increase, being all recorded in new areas without previous rhea observations.

The control of threats and field monitoring is permanent for the wildlife park guards, leaded mainly by women. The removal of fences also continues along with actions to generate bonds of confidence between neighbors with the wildlife and the national park. Progress has been made in the responsible management of domestic animals and the removal of domestic dogs from neighboring border patrol police and the Army areas.

In those places where the removal of the fence has not been possible, during early months of 2021 we started to implement with the border police neighbors, the first two wildlife crossings for rheas which are monitored by camera trapping.

We have achieved an increase of the wild population of rheas from less than twenty birds to 60 individuals, also increased in three times its distribution area (from 1,500 ha to 6,000 ha, approximately) creating a corridor allowing the population to move in at least 15 km linearly to the west. The frequency of rhea sightings is increasing, being able to observe males with more than 30 chicks in the wild.

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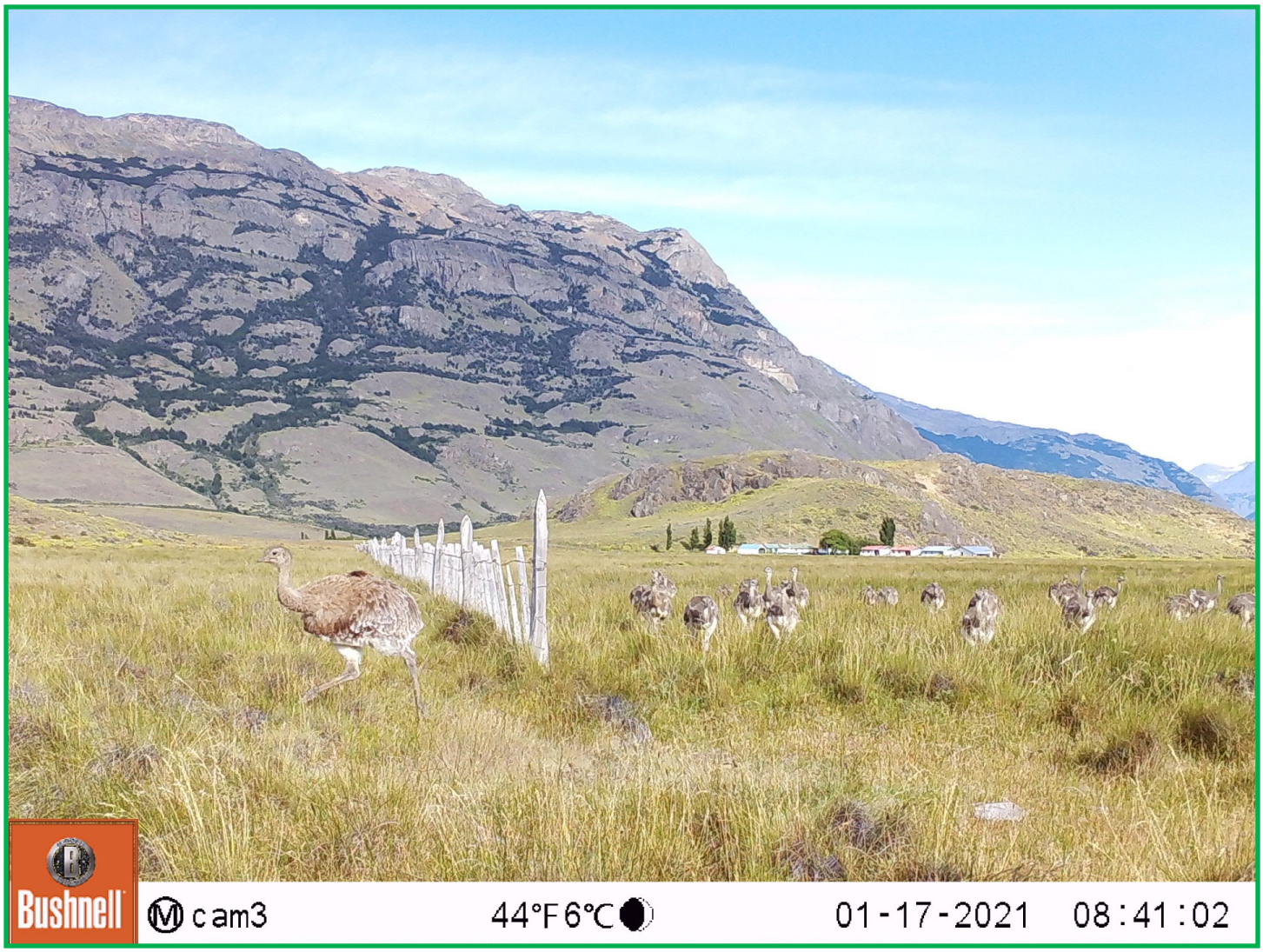
The different conservation actions in the territory, led by the Rewilding team of Tompkins Conservation Chile, allowed us to move towards our goals: increasing the distribution of the species in the National Park and a wild population of at least 100 rheas. We estimated that with this rhea population size, it will sustain itself over time, allowing the occupation of new areas and restoring its roles in the ecosystem as herbivores and seed dispersers in Patagonian steppes. We hope to continue strengthening alliances with collaborators for a definitive contribution for the population recovery of rheas in the Patagonia National Park.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Ratite Stickers!

Our new custom vinyl stickers are available while supplies last by contacting TAG secretary Nicole at nlagreco@sandiegozoo.org.

Stickers are $3 each or all five for $12.

Support the TAG, buy a bag!

Check out our partner Wendy Barnes Design! You can support the TAG by going to *www.wendybarnesdesign.com* and purchasing any ostrich, cassowary, and now KIWI product. 10% of sales on these products will go towards the Struthioniformes Taxon Advisory Group.

This Fall we premiered our new kiwi design!

SHARING EXPERIENCE ON OSTRICH REINTRODUCTION

Dr Marie Petretto, Marwell Wildlife, UK

Mr. Ezzedine Taghouti, Mrs. Hela Guedara, Direction Générale des Forêts, Tunisia

This last year has been a challenge for conservation work in Tunisia, just as it has in many parts of the world. The global pandemic has meant that Marwell's Tunisian-based team has had limited opportunities to carry out field work but we prioritized monitoring of released ostriches in the Tunisian protected areas and despite everything, have made some progresses toward our objectives. Since 2016, as part of continuing efforts to restore the Tunisian aridlands and restore declining endemic wildlife, Tunisia's Forestry Directorate (DGF, Ministry of Agriculture) and Marwell Wildlife (www.marwell.org.uk/conservation) have collaborated to release flocks of North African ostrich *Struthio camelus camelus* in three National Parks (NPs) in their historical range. Small breeding flocks of ostrich have now been reestablished in Dghoumes (near Tozeur), Sidi Toui (near Ben Guerdane) and Bou Hedma (near Mezzouna) National Parks, with a source population established in Orbata National Reserve (Gafsa).

The reintroduced ostriches share their habitat with other emblematic species of the Sahelo-Saharan region, including the reintroduced scimitar-horned (SH) oryx *Oryx dammah*. This aridland-adapted antelope species is today considered extinct in the wild and its reintroduction in the late 80s was the initial focus of Marwell in Tunisia. Our long-term monitoring of reintroduced SH oryx has revealed some challenges and limitations of herbivore reintroductions, including a high predation pressure on SH oryx calves in Bou Hedma NP. Whilst we would expect some SH oryx calves to be lost to predators in a fully functioning ecosystem, poor calf survival slows the progress of restoring a species to the wild. Our team in Tunisia, along with the staff in Bou Hedma NP, conducted several studies to evaluate African golden wolf *Canis lupaster* density and behaviour, SH oryx behaviour and health, and how habitat features in the park might facilitate predation.

The broader biodiversity surveys indicated an abundance of alternative prey, and health screening of SH oryx did not reveal chronic disease in the Bou Hedma NP population. However, the wolf density appears higher in Bou Hedma NP than other protected areas and they do preferentially hunt SH oryx and gazelles. There also is a higher number of local families and school children who come and visits the area.

Building on these observations, the number of visitors allowed in the park has been significantly reduced. This has not only benefitted the SH oryx but it also facilitated the return of the endemic North-African ostriches to Bou Hedma NP. This reintroduction was part of the national ostrich conservation strategy and contributes to the objective to restore functioning ecosystems for SH oryx. It was fascinating to see how the flock (two adults and six juveniles) introduced in October 2019 has started grazing alongside the SH oryx herd. One year after their release into the savannah of Bou Hedma NP, they have not only adapted successfully to their home, but we have observed a reduction in the number of wolves in close proximity to the SH oryx and all 10 oryx calves born in 2020 have survived.

We think that the introduction of this naturally gregarious giant bird together with the reduction in human disturbance has induced a change in the predators' feeding strategy. Continued biodiversity monitoring indicates that the number of wolves in Bou Hedma NP has not decreased, but they switched their hunting preferences. This could be the combination of the introduction of a locally unknown species, highly vigilant, and the availability of a large population of alternative preys, such as the wild boars *Sus scrofa*. This positive effect might be temporary, as the predators are highly adaptive and the behaviors of the reintroduced ostriches are likely to evolve in response to their ever-changing environment. However, the SH oryx population increased significantly in just one year. This reminds us that the long-term success of reintroduction projects depends on wider biodiversity restoration and ongoing post-release monitoring.

Tunisia is committed to developing a regional effort to restore North African ostrich to their natural habitat as part of the International Sahelo-Saharan Conservation initiatives. You can find out more about the the Tunisian reintroduction program in previous Ratite Review of the AZA Struthioniformes Tag and in Marwell's last technical report (https://www.marwell.org.uk/media/other/ostrich_tunisia_report_may2018.pdf).

We aim to secure further healthy semi-wild populations of this threatened sub-species across its former range. Marwell Wildlife's 2021 fundraising campaign will target critical infrastructure developments at the breeding center of Orbata NR to improve the management of ostrich. Improvements began in 2020 with the help of Scott Tidmus from Disney's Animal Kingdom, but there is plenty left to do. In addition to the infrastructure developments, training is needed to increase the level of expertise within the local teams in preparation of further ostrich releases to more protected areas. If you would like to support conservation work for North African ostrich in Tunisia, please contact Marie Petretto for further details.

SAVING THE BIGGEST BIRD ON THE PLANET:

The Adopt-an-Ostrich Program in Niger

THE biggest bird on the planet is on the verge of going under in the silent tide of extinction that has been rolling across the Sahara. Once common across the Sahelo-Saharan zone, the North African red-necked ostrich (*Struthio camelus camelus)*, largest representative of its species, has been extirpated across 95% of its range. Within Niger, the bird is locally extinct in the wild, having vanished over two dacades ago.

Zoos are uniquely positioned to do something about this crisis. Pure-bred *S. c. camelus* still exist in small privately-owned flocks scattered across Niger. Sahara Conservation Fund (SCF), with support and advice from zoos and others, gathered birds and launched a breeding program in Kellé, Niger as a first step toward a recovery strategy for this species. With advice and support, Nigeriens caring for ostrich have substantially improved the bird health and the reproductive success of these birds, relying on natural incubation by the parents. More recent improvements, such as a solar-generated power network and conditioned labs for artificial incubation and hatchery operations, should further boost chick production by salvaging surplus fertile eggs that exceed the parent birds' capacity to cover and brood naturally. With the right material and technical support, Niger can breed North African ostrich that could be returned to the wild.

The AZA Struthioniformes Taxon Advisory Group has championed the recovery of North African ostrich in Niger since 2007. Through SCF, we are part of a public-private partnership with the Republic of Niger and a consortium of private local breeders (CERNK), with the goal of producing chicks for eventual reintroduction. We have helped significantly improve the ostrich breeding pens in Kellé. Bird welfare has responded dramatically to diet improvements and other management changes. Courtship behavior, the production of fertile eggs, reliable parental incubation on the nest, and the subsequent hatching and rearing of chicks bode well for the future for Niger's ostrich.

Let your Zoo's ostrich become an ambassador! SCF is now beginning to assess Niger's Gadabedji Biosphere Reserve (5448 sq. mi.) as a site for a pilot release of ostrich. This is a great opportunity for all of us to make a connection between our zoo ostrich and the conservation of the *biggest bird on the planet*. The AZA Struthioniformes TAG developed the **Adopt-an-Ostrich Program** to fund the acquisition, care and feeding of pure-bred Saharan ostrich in Niger; to maintain the ostrich facilities; and to improve capacity for ostrich management and restoration to the wild. Now more than ever, we need zoos to help support this breeding effort. With your help, we can get North African ostrich back on the road to recovery in Niger.

$500 will cover the care of one ostrich in Niger for a year. Our goal is 100% participation by all zoos holding ostrich, at whatever level each can contribute Please consider making a pledge today and add your Zoo's voice to the growing chorus speaking for the conservation of the biggest bird on the planet. A pledge form has been provided for your convenience.

SAHARA CONSERVATION FUND

PLEDGE FORM

FROM:	
TO:	Sahara Conservation Fund
DATE:	
PURPOSE:	Support for AZA Struthioniformes TAG/SCF Adopt-an-Ostrich program in Niger

☐ _____ wishes to adopt an ostrich for one year for the sum of $500
(insert institution name here)

OR

☐ _____ would like to pledge the amount of $_____
(insert institution name here)

Thank you again for your support.

Please make checks payable to **Sahara Conservation Fund** and mail to:	**Sahara Conservation Fund** c/o Karen Sausman, Treasurer 13220 N Red Hill Rd Marana, AZ 85653

Or wire funds to: **Wells Fargo Bank,** 27630 Ynez Rd., Temecula, CA 92591, USA	
SCF Bank Account No.:	2879230544
SWIFT Code:	WFBIUS6S
US Interior Transfer Prefix:	121000248

Sincerely,

Karen Sausman

Karen Sausman, Treasurer
Sahara Conservation Fund

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New Zealand unveils plan to tackle trade in bones of extinct moa birds

By Eleanor Ainge Roy

New Zealand's conservation minister has released plans to tackle the lucrative trade in the bones of the extinct giant flightless moa bird amid fears that millions of years of science is disappearing as entire skeletons are broken up and sold over the internet or smuggled overseas.

Palaeontologists have been lobbying the government for years to crack down on the trade, with fossils illegally excavated and poached from crown land.

Conservation minister, Eugenie Sage, said: "We have lost too many of our native species, but these lost species, such as moa, remain an important part of our country's heritage, including for Māori whose traditions and whakapapa [genealogy] include moa and other extinct birds, and for science."

Since 2010, museum scientists have documented more than 350 instances of moa bones and eggshells being offered for sale, and in many cases they have identified that these items have been recently removed from protected sites.

"Taking bones and eggshells from protected areas is against the law. It harms Aotearoa New Zealand's cultural, scientific and historic heritage and destroys irreplaceable scientific information" said Sage.

"The proposals to use regulations under the Wildlife Act to prohibit the sale of the remains of extinct species, with some special exceptions, would remove the financial incentive that leads a few selfish people to vandalise our natural and cultural heritage."

Moa, giant flightless birds which stood up to 3.6 metres tall, were endemic to New Zealand and became extinct about 500 to 600 years ago. When they were first discovered by Europeans they were considered a scientific marvel and kickstarted a global frenzy, as museums competed to acquire specimens.

Under New Zealand law it is legal to sell moa bones and eggshells found on private land. There is no requirements for experts to sample or study the bones, or survey the site, as is standard practice in the UK and many other countries. In November last year a private collector in Britain purchased an entire moa skeleton for $34,000.

Although it is illegal to sell or collect moa bones from public conservation land, experts and the department of conservation say looters routinely plunder caves and swamps for remains, which in their entirety can fetch between $20,000 and $50,000, or between $70 and $350 per bone.

There have been incidents of entire skeletons appearing in European auction houses with suspect or unknown origins, according to a moa expert, Trevor Worthy.

Trade Me, New Zealand's version of eBay, has hosted hundreds of moa bone and egg sales over the past five years, and requires no evidence or documentation from sellers that their bones were collected legally.

Concerned museum curators and palaeontologists say bones sold to private collectors are essentially "garbage", because without the correct handling and storage they will disintegrate in a matter of decades.

Richard Holdaway, a palaeontologist, said private sales should be banned. "Moa bones do not belong to individuals, they belong to the country," he said. "There are never going to be any more Moa – every bone sold and destroyed is one less than there will ever be."

"The END"

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