THE WHITE-BELLIED HERON CONSERVATION CENTER

The center for White-bellied Heron conservation breeding, research, and information

Royal Society for Protection of Nature | December 2021

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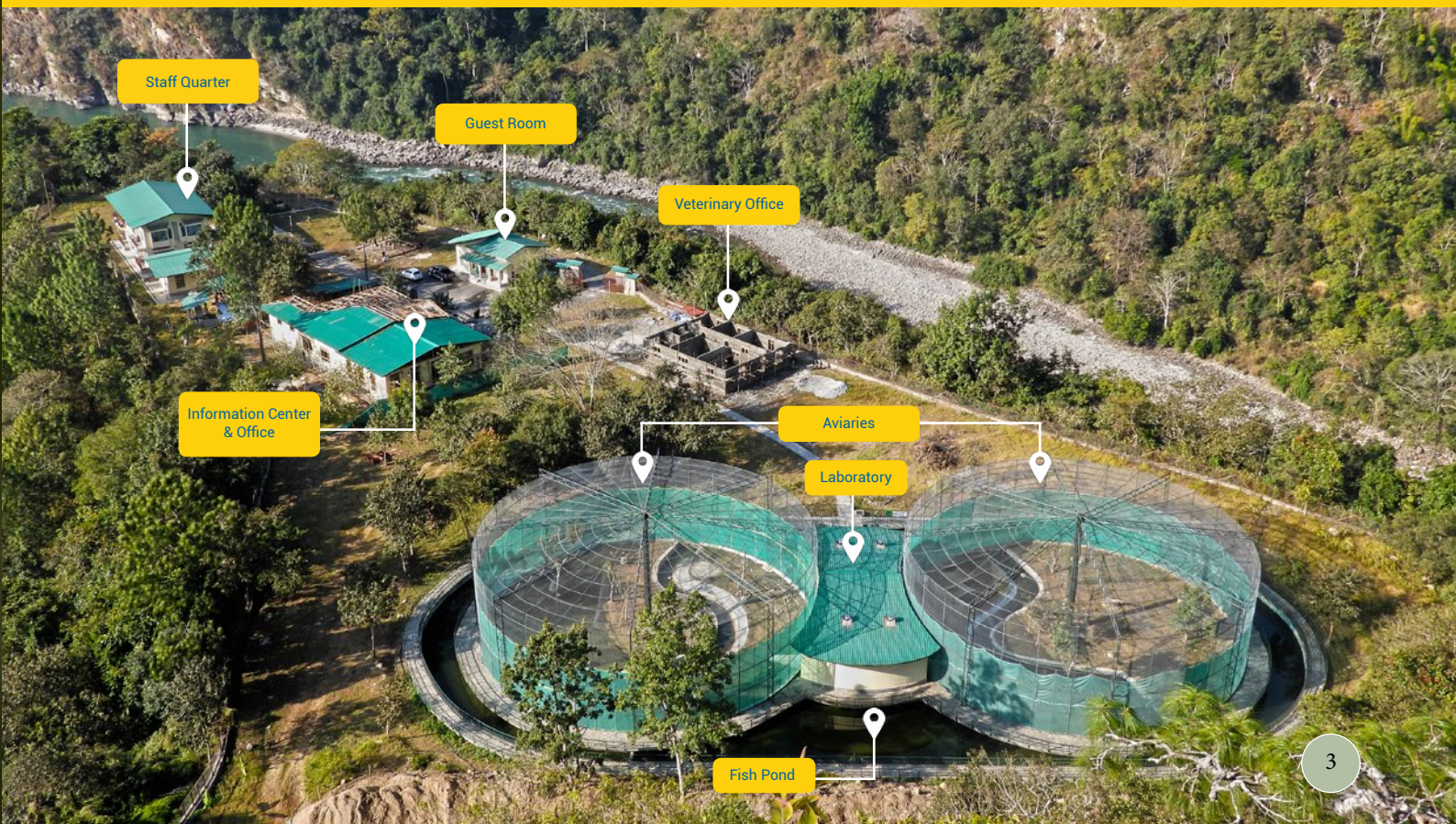
The WBH Conservation Center was constructed with support from the Royal Government of Bhutan, Department of Forests and Park Services and the Punatsangchhu Hydroelectric Project Authority (PHPA II & I).

The operational cost for the WBH Conservation Center is met from the White-bellied Heron Endowment Fund supported by the Mava Foundation.



A NEW PHASE IN WHITE-BELLIED HERON (*ARDEA INSIGNIS*) CONSERVATION BEGINS!

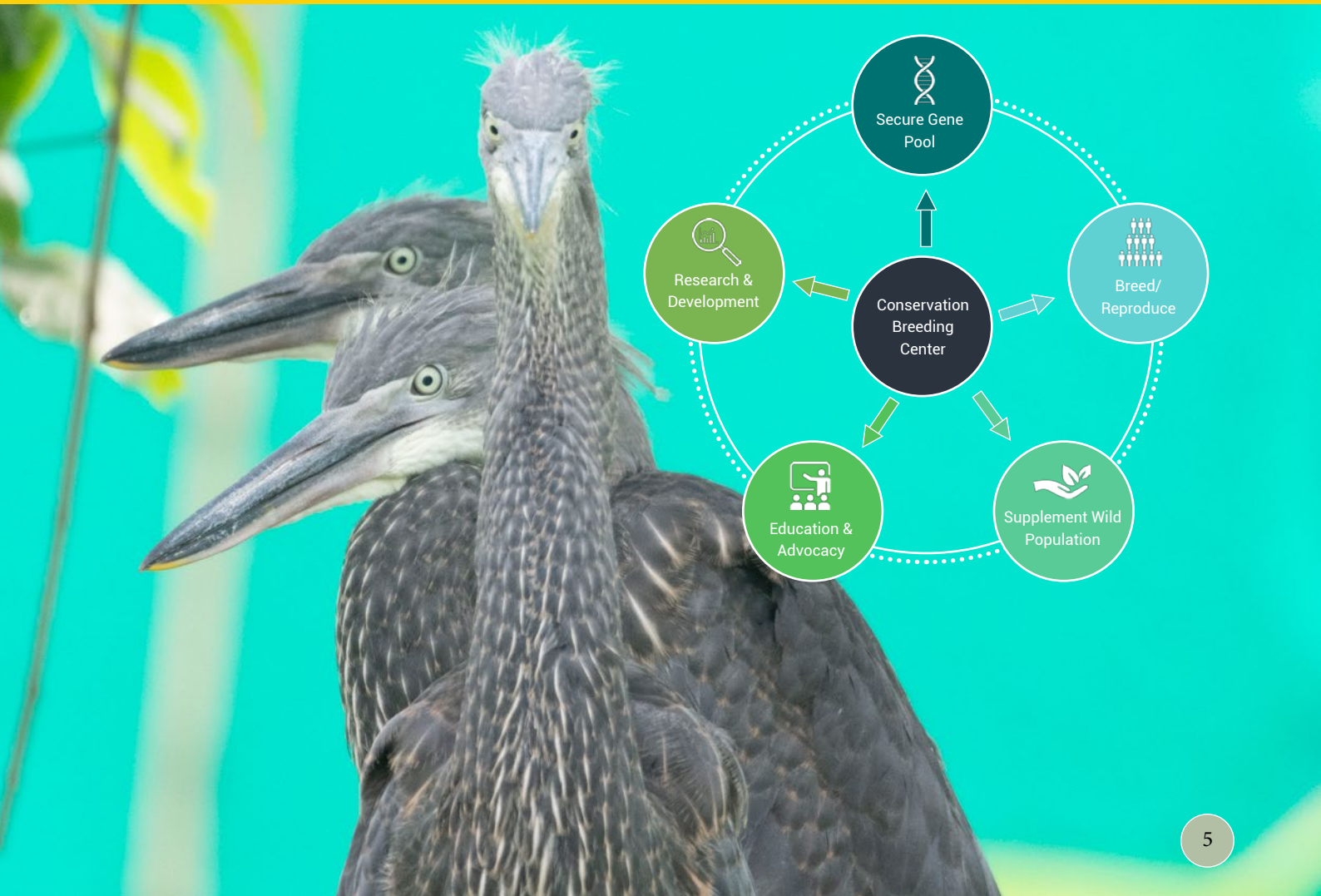
A new phase in the conservation and recovery of White-bellied Heron (WBH) has begun with the establishment of the first pair of ex-situ breeding stock. This year, prefledged juveniles were collected from a wild nest and transferred to the newly constructed WBH Conservation Center at Chachey Dovan, Tsirang, where the birds will be raised and bred.

The collection of selective birds from the wild will continue until the genetic diversity of the population is expressed in several breeding pairs as it is the only source of founders for the species.

In the future, this tiny captive group will function as breeding stock and perhaps will be a safeguard from extinction and a source of birds for the introduction of herons into safe areas where research indicates herons should thrive.

PURPOSE OF THE WHITE-BELLIED HERON CONSERVATION CENTER

The purpose of the WBH Conservation Center is to secure an ex-situ gene pool; rear, raise and breed herons, and supplement the wild population by releasing them into safer habitats. It will also serve as the center for WBH research, a global information hub and coordinate WBH conservation work in the region.



THE FIRST EX-SITU POPULATION

On 04th April 2021, all four eggs in the WBH nest at Rilangthang (a WBH nest site that has been regularly used since 2018) hatched. It was the first time the whole clutch hatched successfully in four years.

At the newly established White-bellied Heron Conservation Center (WBH-CC), located 15 km from the nest site, RSPN's team was busy preparing to receive the chick for the establishment of first-ever ex-situ population of the WBH in the world.

The WBH-CC, the permanent structure built is the first of its kind in the world for breeding and supplementing the wild population of critically endangered WBH.

On 10th April, the youngest chick of six days and the oldest of 11 days old was just at the right stage to be transferred and reared in WBH-CC. A slight delay could result in parents discarding the weakest chick or siblicide, natural brood reduction processes in herons.

On 11th April 2021, at 5:30 AM, the team was all set for the mission to collect the first batch of herons to the new center moved out. After 30 minutes of drive and climbing down the cliff for 45 minutes, the team arrived at the river site with all equipment and the raft. The targeted nest to collect the chicks is on the other side of the mighty Punatsangchhu.

The team carefully scanned the nest; it was all calm. A parent was brooding and the other was probably out for feeding. About 200 meters from the nest, while some of the team members looked for the safest pathway to raft across the river and approach the nest, some of us monitored the activities in the nest. At 7:00 AM, as the team was dragging the raft to wave across the river, the other parent flew down to the nest. All seized to move an inch and remained calm for a while as the parents were alert and actively observed the brooding activity.

As usual, they swiftly exchanged, and the earlier brooding parent left to feed while the other remained in the nest and quickly fed the chicks. After, almost 30 minutes of observation, the chicks were observed calmed and the parent was brooding again. There was a tranquil environment on the nest.

The team then swiftly raft across the river within a few minutes and safely anchored to the other riverbank, near the nest.

Once on the other side, the team hurriedly walked to the nest tree. It was a surprisingly different scene of unlike what the team saw through the binocular, the nest tree is a thin, half molded broadleaf species grappled by thorny climber swinging at the river breeze. The plan of climbing with the tree climbing set equipped for the team seems less chance with hardly being able to see a way through the bush to the canopy.

Leaving the plan to climb the tree using the tree climbing set, Mr. Tshewang put a chick collecting bag in his pocket, tied the throw rope around the waist, and started to ascend. With the barefoot, he battled the thorny bush covering the tree and tightly cling with his gripping hands and toes to the tree. As he ascends higher up, he was leaping up like a frog making coverage of an inch at a time. But he made it!

When Tshewang was halfway climbing up the tree, the brooding parent flew off and perched on the other tree, approximately 50 m. It was fully alerted but remained there observing as Tshewang started putting tiny chicks into a chick collecting bag and gently made way back down through the rope. The rule was "leave one and lift all". Of all live chicks, only one will be left in the nest and the rest collected. All four chicks were alive, and we collected three chicks selecting the ones that observed better growth.

In 30 minutes, the team was back to the river and the rafting team were ready to take to the other side. As the team was crossing the river, the waiting parent flew back to the nest; alerted, and perhaps heartbroken. Few of the team members rushed to the WBH-CC with chicks and others remained for a while at the nest site to monitor.

It was observed that after an hour, the parent calmed and sat to brood the lone chick. To the great relief of the team, the other parent also flew back from feeding and they exchanged. The parent seems very sad, the team could feel it. A few minutes later, it regurgitated a large fish, and the tiny chick only took a portion of it. The parent ate back the remaining fish and sat calmly. The lone chick was successfully raised and fledged after 71 days.

At 9:45 AM, the mission was almost complete with the team back to the center with chicks. Everything went as planned and set. Then the chicks were safely placed in the artificial nest and let calm down. After an hour, all of them were relaxed and sleeping. Their weight and other key measurements were recorded and let them calm down again. The smallest one amongst the three was less than 80gm while the biggest was more than 500gm. At 11:30 am, after two hours of their arrival at the new home, they were served with freshly prepared fish They were fed manually. For two days, they were fed manually, but from the third day, they started feeding themselves from the tub.

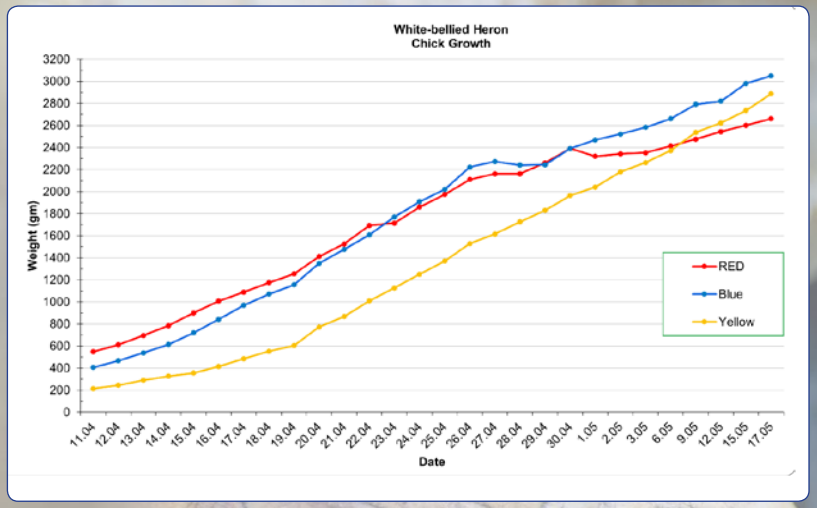
Bravo! We have now the first batch of ex-situ population in the newly constructed WBH-CC!

HAND RAISING THE WHITE-BELLIED HERON CHICKS!

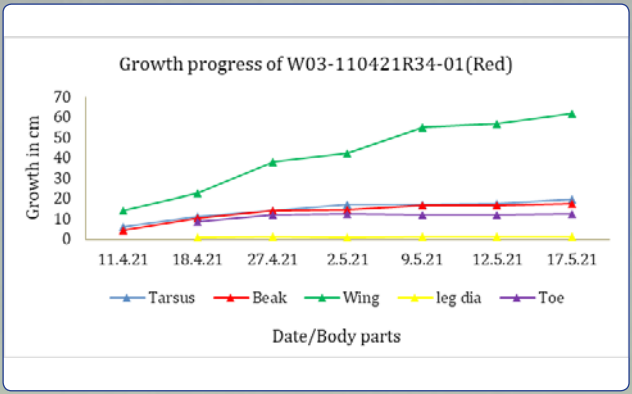
From a tiny ball of less than 200gm in a palm to magnificent 3000gm flying giants – we hand raised them! Barely a week old, fleshy live balls, raising tiny heads only to beg for food were what we brought to the lab – but with great confidence, we knew that these tiny creatures would grow into beautiful rare herons that the world strives to save from extinction.The first week was the most challenging time for us in raising them. With no experience, we feared everything; how do we hold them? How should we feed? Live fish or dead, or half-dead? Do parents feed them warm or cold? How much should we feed? How many times should we feed? Will not they get the disease from our hands? What temperature should we keep them in? What about humidity? And exposure to the sun? We were asking thousands of questions ourselves.

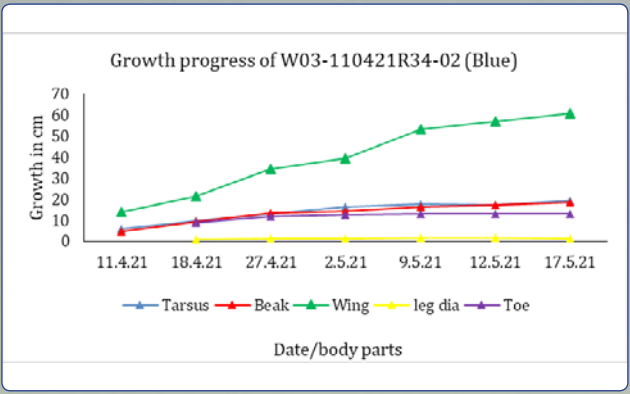
Thanks to our virtual advisors, Dr. Helena, Mr. Roman Horsky, Mr. Antonin Vaidl, Mrs. Catherine E. King, Mrs. Gemma Goodman, Dr. George Archibald and many more. COVID-19 pandemics barred experts from travelling and providing hands-on training to our staff, but they were here all times virtually. Anytime we are in doubt, we would send a message in the WhatsApp group, and they would always have some solutions. Unexpectedly, it worked out very well.

Chicks were exclusively fed fish with additives (Nutrobal, B-Komplex Forte, Bio calcium) and probiotics (Ac-i-prim) alternatively during morning and evening feeding time when the chicks were 34 days till 57 days and again started to give additives (nutrobal and Thiamin) and kolumbiferm (Probiotics) for one week alternatively when they were 234 days old to ensure they get a balanced and enriched feed.



For five weeks, the weights of the chicks were measured daily to monitor their growth. Measurement of Tarsus, beak, wing, toes were taken once a week for seven weeks.





For 36 days, until chicks were 45 - 47 days old, they were raised inside the laboratory with regulated temperature and humidity. An artificial nest, resembling a wild nest, 1m^2 in size, made of dried branches and twigs with a shallow depression in the center filled with softer materials for chicks to sit, sleep and rest.

CHICKS INSIDE THE AVIARY

When chicks were 46 - 48 days (on 37th day), they were transferred to aviary. The aviary consists of another artificial nest built at breast height covered by the natural shade trees and placed perching logs and rocks with live fishes swimming in the water running in the middle of the aviary. It was much wider with space for chicks to walk around, flap wings and play. Chicks were observed playful in the aviary. They would walk around, jump, preen, arrange twigs in the nest, flap wings and stand for hours. Every day, as they grew bigger, the agility gained and often make short calls.

By 58 days, they started walking out of the nest and would perch on a branch for hours proving the control of their agility and mobility. For the night, they would cluster in the nest.

By 65 days they could take short flights. They spent more time outside the nest and for hours looking at the fish and water in the pond below the nest. But would never descend to the ground.

By 72 days, they were huge. It is the time they would fledge if they were in the wild. They started to fly down to the pond, walk around the aviary and take short flights between the perches. They would still return to the nest in the evening and roost together.

Now the chicks are 9 months old juveniles. They look huge like an adult birds and act like an adult. As they grew older, they attained more sustained flights inside the spacious aviary. They get inside the pond, practice fishing themselves, drink water from the pond, and often catch fish themselves. They roost on separate trees, and they feed on different corners of the pond. They call, they fly, they walk, they preen, they bask, and often avoid being too close with each other. They are healthy and cheerful now.

As they grow up day by day, we are seeing a more secured future of the WBH. Once they are adults, they will have their own breeding partner and secure their hereditary for many generations to come. They are the most magnificent birds and indeed they are children for us. Seeing their growth in the hands of human care will be always cherished for life long. May they live long to sustain the population of WBH on the earth.

WE LOST THE YOUNGEST CHICK

On 10th June, at 6:00 AM, as usual, the keepers went for the morning round of checkup and to feed the birds. Inside the aviary, they observed the nest was empty for the first time; all three chicks were on the ground. Although the two elder chicks (Red & Blue) have been on the ground for the past couple of days, the youngest (Yellow) was yet to take its first flight off the nest. By then, the chicks have been in the center for the past 61 days; 37 days in the lab and 24 days in the aviary. Chicks were collected 9 – 11 days old from the wild nest, so they were 70 – 73 days old; an exact time they would have fledged if in the wild.

However, the scene on the ground was suspicious. While the Red and the Blue were walking around the fishpond, the Yellow was lying down near the nest tree beside the pile of rocks. It was also making short continuous calls while its head was laid flat on the ground. Keepers rushed to the site and examined the bird. Physically, it was all good. There were no wounds, no bleeding, no injuries but it could not raise the head. They took the bird to the lab and let it rest in the artificial nest. Slowing, the bird was losing its breadth. The team contacted the Veterinary Doctor in Prague Zoo, for first aid but realized there was very little we could do. Her advice was “probably, there are internal injuries, let the bird rest for some time". But, within a few minutes, it was all silent. By 6:45 AM, the bird was dead. Later, through a detailed postmortem,

it was found that the cervical vertebrae were fractured at the neck region and there were a few fractures at the fibula region of the right leg and internal bleeding. Probably, it failed to stably land on its first flight and accidentally hit on the aviary pole or perches.

So, what could have gone wrong? When the other two chicks could successfully fledge, why Yellow couldn't? In the wild, generally, chicks fledge in the sequence they are borne. We observed that older chicks often fly off the nest up to a week before, leaving younger chicks in the nest and once they are out, they don't return to the nest. Younger chicks, take their own time to grow and slowly follow their elders. However, in the aviary, the area is very small, and the youngest chick was observing its siblings walking around, feeding from the pond, and doing a lot of activities and they were often returning to the nest. This probably, provoked the youngest chick to attempt to fly before it was ready. The nest was built around 1.8 meters high, and chicks could easily take off but there is no wide space for them to fly, manoeuvre and comfortably land. So, if the chicks absurdly take off high, they must take sudden fall and abrupt landing, which could hurt them.

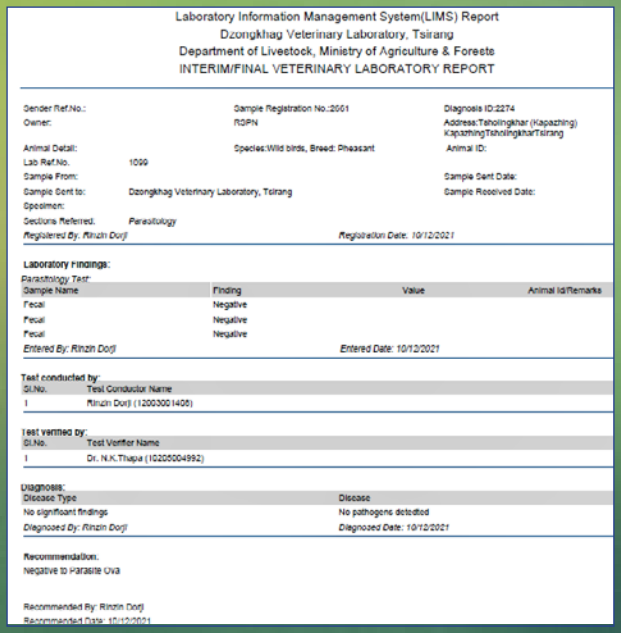
Moving ahead, simple changes, such as lowering the height of the nest, monitoring and if necessary isolating younger chicks from fledged mates would avoid such mishaps. Looking back, we feel we could have saved the bird if it was not the first experience. Most importantly, the death of the chick has alerted and though us a great lesson. We have already made necessary changes inside the aviary and artificial nest for the safety of the chicks.

Fledging is the most critical period in the life of birds. Studies have found mortality of up to 69% in the first year and up to 31% in the second year in Herons. In White-bellied Herons, no detailed post-fledging survival assessment have been conducted due to the extremely small breeding population and topographical difficulties in monitoring fledged juveniles. However, two decades of nest monitoring suggests that 95% of the time, only two chicks fledge per nest, although they generally have clutch size four and brood size of three. In the wild, the herons have natural mechanisms to reduce brood size based on the availability of food and the environment. However, in the conservation center, a brood reduction mechanism is not necessary. The nestmates mostly fight for food and when they are fed adequately, chicks no more perceive siblings as competitors.

HEALTH SCREENING

Outbreak of diseases in the center is our biggest fear. They are very precious few, and we cannot lose them. Every morning, the team at the center observe them for hours to see they are well. Chicks have their personal health books, and all their activities are recorded.

Every morning dropped feathers are collected and preserved to screen for parasites, mites, ticks, fleas. Quarterly, faecal samples are taken to the veterinary hospital in Damphu for screening intestinal parasites; tapeworms, roundworms, coccidiosis, Giardia, trichomonads, etc. Until now, no parasites have been detected and chicks are growing healthy.



Laboratory Information Management System(LIMS) Report
Dzongkhag Veterinary Laboratory, Tsirang
Department of Liveetock, Ministry of Agriculture & Forests
INTERIM/FINAL VETERINARY LABORATORY REPORT

Gender Ref.No.:
Owner:
Sample Registration No.:2001
RGPN
Diagnosis ID:2274
Address:Tsholingkhar (Kapazhing)
KapazhingTsholingkharTsirang
Animal Detail:
Species:Wild birds, Breed: Pheasant
Animal ID:
Lab Ref.No. 1099
Sample From:
Sample Sent to: Dzongkhag Veterinary Laboratory, Tsirang
Specimen:
Sections Referred: Parasitology
Sample Sent Date:
Sample Received Date:
Registered By: Rinzin Dorji
Registration Date: 10/12/2021

Laboratory Findings:
Parasitology Test:

Sample Name	Finding	Value	Animal Id/Remarks
Fecal	Negative		
Fecal	Negative		
Fecal	Negative		

Entered By: Rinzin Dorji
Entered Date: 10/12/2021

Test conducted by:

Sl.No.	Test Conductor Name
1	Rinzin Dorji (12003001408)

Test verified by:

Sl.No.	Test Verifier Name
1	Dr. N.K.Thapa (10205004992)

Diagnosis:

Disease Type	Disease
No significant findings	No pathogens detected

Diagnosed By: Rinzin Dorji
Diagnosed Date: 10/12/2021

Recommendation:
Negative to Parasite Ova

Recommended By: Rinzin Dorji
Recommended Date: 10/12/2021

SEXING

We have a male and a female nestmate in the aviary. Sexes were confirmed using a molecular sexing technique with support from the National Museum of Nature and Science, Tokyo Japan. White-bellied Herons are sexually monomorphic. But to an expert's eye, males appear slightly bigger than females.

Inside the aviary, females are shier; and often aggressive. Males spend more time feeding and walking around!

As a chick, females are silent and shier; while males are more vocal and have a bigger appetite.

FISHERY

In the wild, White-bellied Herons mostly feed on fish. In fact, there is no evidence WBHs feeding on anything other than fish during our past years of observation. In the center, we exclusively feed them with fish. On average, we feed each bird 300gm of fish in addition to what they feed from the pond.

Unfortunately, there are no commercial fish farms in Bhutan. We raise our own fish in the center. The center currently has a pond with the capacity to raise up to 15,000 fingerlings. We also buy from local fisheries.

There is a huge demand for fish as the population of herons in the center grows. Additional fishponds with the capacity to raise additional 15,000 fingerlings are under construction. But still, fish sustainability in the center will remain a huge challenge, moving ahead.

WHITE-BELLIED HERON INFORMATION & EXHIBITION CENTER

A global information hub!

Once complete, the center will serve as a one-point information hub for White-bellied Heron conservation, breeding and research.

WHITE-BELLIED HERON VETERINARY AND REHABILITATION CENTER

Once complete, the center will be equipped to provide veterinary services within, conduct basin parasitological analysis, and provide care and medication and rehabilitation of sick, diseased, or injured birds.

CHALLENGES & LESSON LEARNT

- The White-bellied Heron conservation center is an all-new establishment. For us, it is the first of its kind and had no experience of doing anything similar. It was all challenging and often overwhelming.

- Getting required laboratory equipment was challenging as there were no suppliers of similar items within Bhutan. Prices of the items were also extremely high due to COVID-19 pandemic. Collaboration and support of Zlin and Prague zoos were critical in arranging necessary quality items to the center.

- However, the biggest challenge was collecting the chicks from the wild. The WBH nests are on locations not easily accessible. They are mostly on cliffs, tall trees and next to rivers. Getting to the nest is often challenging and life-risking. We were able to do it we great team spirit and timely planning.

- Raising chicks in captivity was new for all of us. We couldn't invite international experts due to COVID-19 travel restrictions. Therefore, we had to manage with virtual guidance. A group was formed in WhatsApp and any time we had a doubt, we would consult with experts from Zlin Zoo, Prague Zoo and Vets. It worked out all well and we were able to raise chicks. Now they are more than 270 days old juveniles, healthy and strong.

- With the first successful experience, we now have some idea on how to collect chicks? when to collect? and how to raise them in captivity? We have built our preliminary feeding and rearing manuals.

- Some of the key things we have realized are the need for space and aviaries, continued fish supply and supply of supplements (Vitamins, enzymes, nutrient supplements etc.).

- Most importantly, the mortality of one of the chicks was a great lesson. We have already made necessary changes inside the aviary and artificial nest for the safety of the chicks.

MOVING AHEAD & ANTICIPATED CHALLENGES

- Moving ahead, we plan to make the White-bellied Heron center, a global hub for WBH conservation and information dissemination. It will also secure a gene pool that would preserve the WBH for all times. This is just the beginning. The size of the facilities, equipment, HR and technical capacity has to be upscaled as we have more herons in the center.

- Currently, we have two nestmates, a male and a female. The collection of selective birds from the wild will continue until the genetic diversity of the population is expressed in several breeding pairs as it is the only source of founders for the species.

- The immediate challenge we foresee is space and aviaries for herons. As per the expert's advice, maybe up to 50 birds has to be raised in the center, when in full capacity. Two aviaries can accommodate only up to four birds. We need to construct additional aviaries to accommodate up to 46 birds and a training aviary for releasing program. Currently, we have two herons, and we plan to collect additional birds in 2022. All the aviaries will be full and if we don't start construction now, we will run short of space to keep our birds.

- The other challenge is managing feed for herons. Herons are piscivore and we need a huge quantity of fish supply. Unfortunately, there are no commercial fisheries in Bhutan to supply fish and we must grow our own. Currently, we have a small fishery in the center, but it can only feed two birds. From next year, when we have more birds, we need to scale up our fish production. We need to construct additional fisheries.

- Currently, we have only four staff working full time in the center. Staff in the headquarters are mostly engaged in in-situ conservation work. In the near future, we also foresee the need to increase HR capacity and provide additional training to build relevant skills.

- Approximately US$150,000 are needed annually to support the White-bellied Heron conservation works in Bhutan. This amount is expected to increase as the center starts to operate at full capacity. Recently, we have also developed WBH Conservation Action Plan for Bhutan which is expected to guide the conservation actions for the next 10 years. Although some of the activities are covered under current projects, there remains a huge financial gap. In addition, we need funding to support the construction of actional aviaries, fisheries, and amenities at the conservation center. Currently, only half of the operational cost is met from the WBH Endowment Fund, supported by the MAVA foundation. Therefore, there remains a huge financial challenge in putting our plans into action.

ACKNOWLEDGEMENT

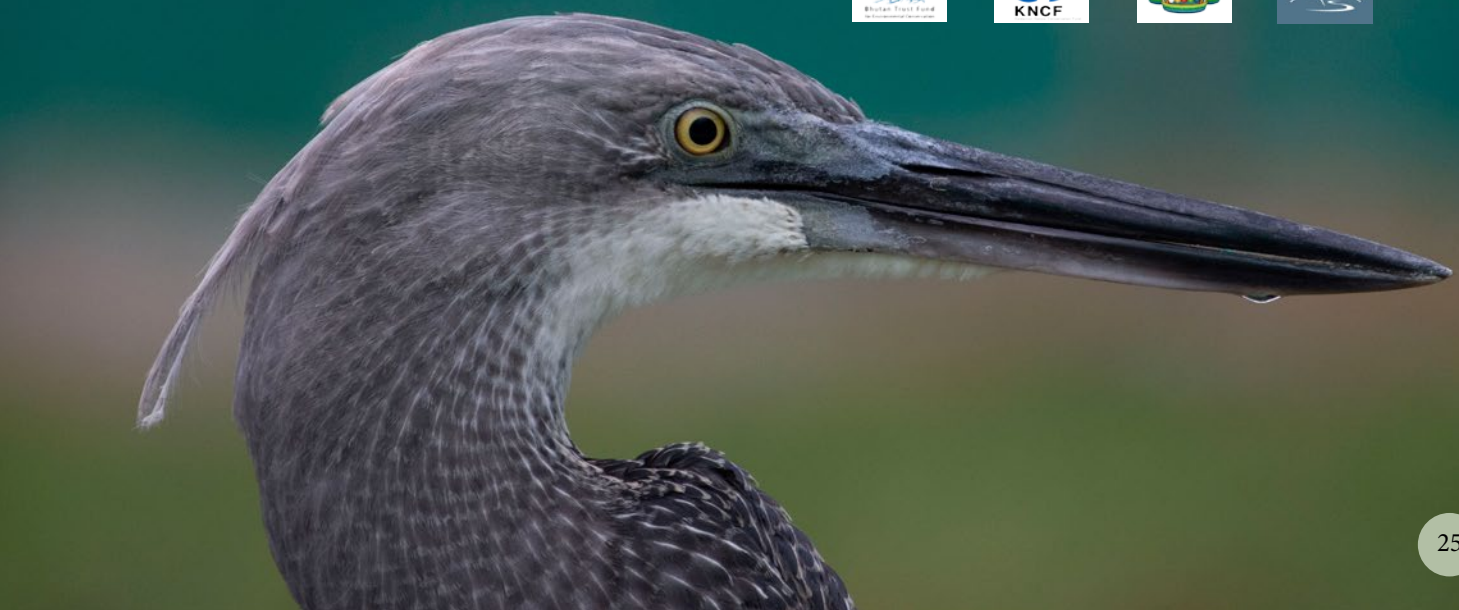
The Royal Society for Protection of Nature would like to thank all donors, partners and advisors for supporting the White-bellied Heron conservation work. Thanks to synchronicity Earth for supporting a utility vehicle which has significantly enhanced the critical service delivery, timely travel and transport at the center.

Technical Advisors

Dr. Helena vaidl, Prague Zoo, Czech Republic
Mr. Roman Horsky, Zlin Zoo, Czech Republic
Mr. Antonin Vaidl, Prague Zoo, Czech Republic
Mrs. Gemma Goodman, Synchronicity Earth
Dr. George Archibald, ICF, USA
Mr. Jonathan Charles Eames OBE
Mrs. Catherine E. King, EZAA.

Donors & Partners

Mr. Jonathan Charles Eames OBE & Dinh Thi Hoa
Prof. Dr. Iaso Nishiumi, NMNS, Japan
Prof. Dr. Satoshi Shimano, Hosei University, Japan
Dr. Yuji Okahisa, Ministry of Environment, Govt. of Japan



RSPN STAFF PROFILE

Head Office


Kinley Tenzin, PhD
Executive Director


Rinchen Wangmo
Director, PDD


Lungten Norbu, PhD
Specialist


Rebecca Pradhan
Advisor

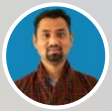

Norbu Wangdi, PhD
Project Coordinator


Sonam Jamtsho B
Chief, FID


Tshering Dorji
Chief, ADM/HRD


Phurpa Dorji
Specialist


Tsheten Dorji
Chief, SLD


Indra Prasad Acharja
Chief, SHCD


Jigme Tshering
National Coordinator


Deki Dema
Interim Chief, CED


Namita Kafley
Sr. Finance Officer


Tshering Tobgay
Project Officer


Khachi Wangmo
Project Officer


Dechen Tshomo
Accounts Officer


Sonam Wangmo
Sr. Adm/HR Assistant


Sangay Dema
Communications Officer


Kinley Gyem
Receptionist


Tshering Dendup
Sr. Driver


Damcho Yonten
ICT Officer


Kezang Tobgye
Caretaker


Sonam Rinzin
Sr. Communications Officer


Tenzin Wangmo
Cleaner


Dechen Wangmo
Cleaner


Tenzin Nima
Driver


Norbu Wangdi
Caretaker

Project Office, Zhemgang


Narayan Ghalley
Officer In-Charge


Dhendup Wangchuk
Project Officer


Karma Wangchuk
Project Officer

White-bellied Heron Conservation Center


Tshewang Lhendup
Officer In-Charge


Sonam Tshering
Sr. Project Assistant


Thinley Phuntsho
Project Officer


Samten Leki
Veterinary Officer

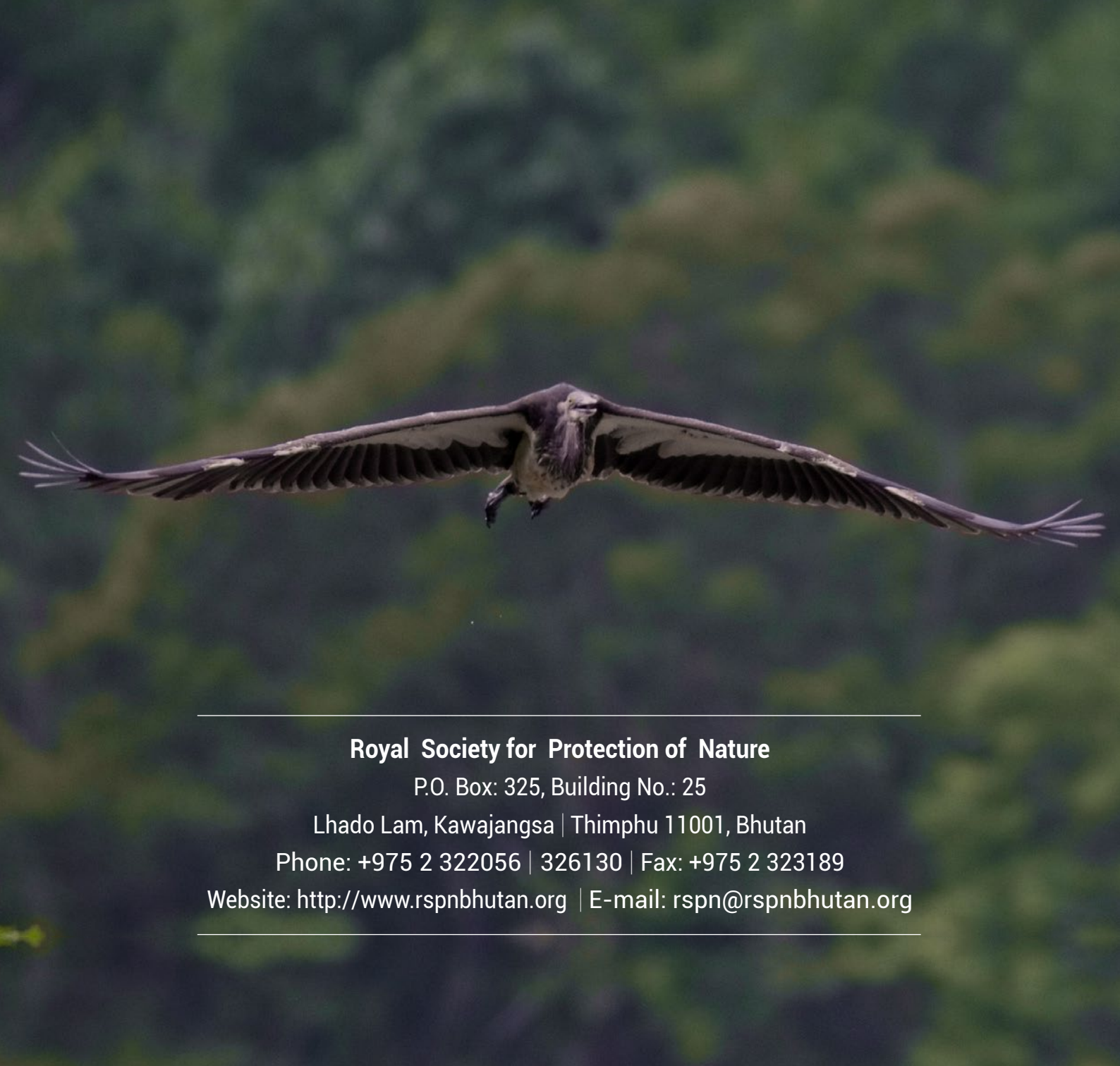

Wangdi Zam
Caretaker

Black-necked Crane Education Center


Santalal Gajmer
Officer In-Charge


Tshering Zangmo
Center Assistant


Karma Dema
Caretaker



Royal Society for Protection of Nature

P.O. Box: 325, Building No.: 25

Lhado Lam, Kawajangsa | Thimphu 11001, Bhutan

Phone: +975 2 322056 | 326130 | Fax: +975 2 323189

Website: http://www.rspnbhutan.org | E-mail: rspn@rspnbhutan.org