



Figure 4. Cordial welcome with poster for “Dodong” and “Hulky” at Manila Airport. Photograph: CPPI.

the importance of this transfer: “This is an excellent and positive example how *ex-situ* measures such as conservation breeding projects, coordinated by modern, scientifically led zoos, can help to actively support the *in-situ* conservation measures in the country of origin”. Cologne Zoo’s Director Professor Theo Pagel, who is also President of the World Association of Zoos and Aquariums (WAZA) summarized: “This is another successful example of the “One Plan Approach”, which is supported by the IUCN and aims to develop integrative strategies to combine *in-situ* and *ex-situ* measures with groups of experts for species conservation”.

If all works out as was planned, DENR-BMB in collaboration with CPPI has plans for further repatriation of offspring from the European captive-breeding program to the Philippines.

Assistant Secretary for Climate Change and concurrent Director of BMB, For. Ricardo Calderon welcomed the repatriation of the captive-bred Philippine crocodiles, with high hopes that these purebred Philippine crocodiles will contribute to the enhancement of the species’ wild population. “We need to step up our efforts to help recover the decimated population of the Philippine crocodile, including the protection of their wetland habitats, not only for the crocodiles but also to secure ecosystems services for the welfare of communities”, Calderon exclaimed.

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East and Southeast Asia

Philippines

FIRST NESTING OF INTRODUCED PHILIPPINE

CROCODILES (*CROCODYLUS MINDORENSIS*) IN PAGHUNGAWAN MARSH, SIARGAO ISLAND, SOUTHERN PHILIPPINES. Seven years after the first introduction of Philippine crocodiles (*Crocodylus mindorensis*) in Paghungawan Marsh in March 2013, nesting in the wild was observed for the first time. On 8 November 2020, two *C. mindorensis* nests were discovered by citizen scientist Fredo Magallanes, while he was conducting a monitoring activity in the marsh.

One of the nests contained 9 eggs, while the other was a false nest associated with the latter. The nest containing eggs was located in a shaded area (9°53.582’ N, 126°4.774’ E), approximately 34 m from the water’s edge. It had a circumference of 5 m and a height of 0.64 m (Fig. 1).

The eggs were estimated to have been laid in late October 2020, which is outside the reported laying period of March to July in Mindanao (Cruz *et al.* 2012). Wild Philippine crocodiles were observed nesting in April-May in Luzon. The same months have been observed for captive crocodiles in Negros (Alcala *et al.* 1987), and February-October for captive crocodiles in Palawan (van Weerd 2010).

This first record of nesting marks the beginning of a successful introduction program for *C. mindorensis* in the Philippines, and ongoing monitoring by Crocodylus Porosus Philippines Inc. (CPPI) and the citizen scientist community continues to increase biological knowledge on the species (Diesmos *et al.* 2012). Details on egg fertility in the nest are still pending, and will be reported in due course.

Since the first release of juvenile *C. mindorensis* in the marsh, continuous monitoring has been undertaken to assess the condition of the introduced crocodiles. Interestingly, individual *C. mindorensis* have been observed utilizing elevated limestone crevices and caverns on steep slopes adjacent to their aquatic habitats (Binaday *et al.* 2020), and recently initiated radio-telemetry study may provide more details on this interesting behaviour.

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Literature Cited

Alcala, A.C., Ross, C.A. and Alcala, E.L. (1987). Observations on reproduction and behaviour of captive Philippine crocodiles (*Crocodylus mindorensis* Schmidt). Silliman Journal 34: 18-28.

Binaday, J.W.B., Manalo, R.I., Baltazar, P.C. and Magallanes, F.P. (2020). *Crocodylus mindorensis*: Habitat use. Herpetological Review 51(2): 319-321.



Figure 1. Philippine crocodile nest (left) with citizen scientist (middle), and members of the People's Organization and technical staff of the Pilar Municipal Tourism (right) in Paghungawan Marsh, Siargao Island, Mindanao, Philippines.

Cruz, M.V., Mendoza, P. Jr. and Biñan, A.G. Jr. (2012). Successful breeding of *Crocodylus mindorensis* under soft release conditions. *Crocodile Specialist Group Newsletter* 31(3): 10-11.

Diesmos, A.C., Guinto, F.M., Manalo, R.I. and Mercado, V.P. (2012). Philippine Crocodile *Crocodylus mindorensis* Release Program in Siargao Island Protected Landscape and Seascape. Project proposal. *Crocodylus Porosus Philippines, Inc.*; Protected Areas and Wildlife Bureau, Department of Environment and Natural Resources; Silliman University-Angelo King Center for Research and Environmental Management; and, National Museum of the Philippines.

Van Weerd, M. (2010). Philippine Crocodile *Crocodylus mindorensis*. Pp. 71-78 in *Crocodiles. Status Survey and Conservation Action Plan. Third Edition*, ed. by S.C. Manolis and C. Stevenson. *Crocodile Specialist Group: Darwin*.

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South Asia and Iran

Nepal

GHARIAL CONSERVATION BREEDING CENTER IN CHITWAN NATIONAL PARK: CONTRIBUTION, CHALLENGES AND OPPORTUNITIES. In 1975, Scottish researcher H.R. Austurn came to Chitwan National Park (CNP), Nepal, to study Gharials (*Gavialis gangeticus*), and took some Gharial eggs to Odissa, India, for artificial incubation. Inspired by that event, then CNP Conservation Officer Mr. Rampreet Yadav started to incubate Gharial eggs in CNP, by putting eggs in dug-out sand pits. A few years later, the Gharial Conservation Breeding Center (GCBC) was formally established in CNP under the leadership of Mr.

Yadav.

The GCBC is an *ex-situ* facility for breeding and rearing Gharials, located at Kasara in CNP. It was established in 1978 with the aim of reinforcing the plummeting population of wild Gharials and maintain a viable wild population (Maskey 1989; Khadka 2013). Since its establishment, the GCBC has been collecting Gharial eggs from the Rapti and Narayani Rivers, incubating them in its facilities and rearing hatchlings until they attain a total length of at least 1.5 m, for eventual release into the wild (Maskey 1989; Khadka 2014). The GCBC has a satellite facility - the Gharial Monitoring Center (GMC) located on an island in the Narayani River, some 45 km southwest of the GCBC (Khadka 2010).

The main objectives of the GCBC are to:

- a. maintain viable populations of Gharials *in-situ*;
- b. act as a research center facilitating and coordinating scientific studies on crocodylians and wildlife in general; and,
- c. function as recreation and awareness center.

Major contributions and achievements of the GCBC include:

- a. Reinforcement of wild Gharial population: By the 1980s, only 57 Gharials were estimated to be in CNP, and no more than 200 Gharials across their range in the wild (Khadka 2011). Between 1978 and December 2020, the GCBC released 1565 Gharials into various Nepalese rivers [Narayani (399), Rapti (885), Kali Gandaki (35), Saptakosi (95), Karnali (41), Babai (110)], and the population in CNP is estimated as 230 Gharials as of February 2020.
- b. Telemetry study: For an ongoing telemetry study on Gharials in Nepal, led by Phoebe Griffith, 20 Gharials were randomly caught in the Rapti River in 2019, all of which were found to be Gharials originating from the GCBC. This suggests that captive-released Gharials make up a significant proportion of the Gharial population in the Rapti River.

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