

## New Records of the Critically Endangered Asian Narrow-Headed Softshell Turtle, *Chitra chitra*, in Thailand

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**ABSTRACT.** – The Asian narrow-headed softshell turtle, *Chitra chitra* Nutphand, 1986, one of the world’s largest freshwater turtles, inhabits Thailand, peninsular Malaysia, and Indonesia and faced severe population declines in the recent decades, now listed as Critically Endangered by the IUCN. In Thailand, while *C. chitra* is known to inhabit the Mae Klong River and Mae Ping River, its ecology and population status are poorly understood. Our field surveys and informal discussions with local people along the Mae Klong River in Kanchanaburi and Ratchaburi provinces confirmed the species’ continued presence in its historical range after a 20-yr gap in published records, also documenting its habitat and threats at the local scale.

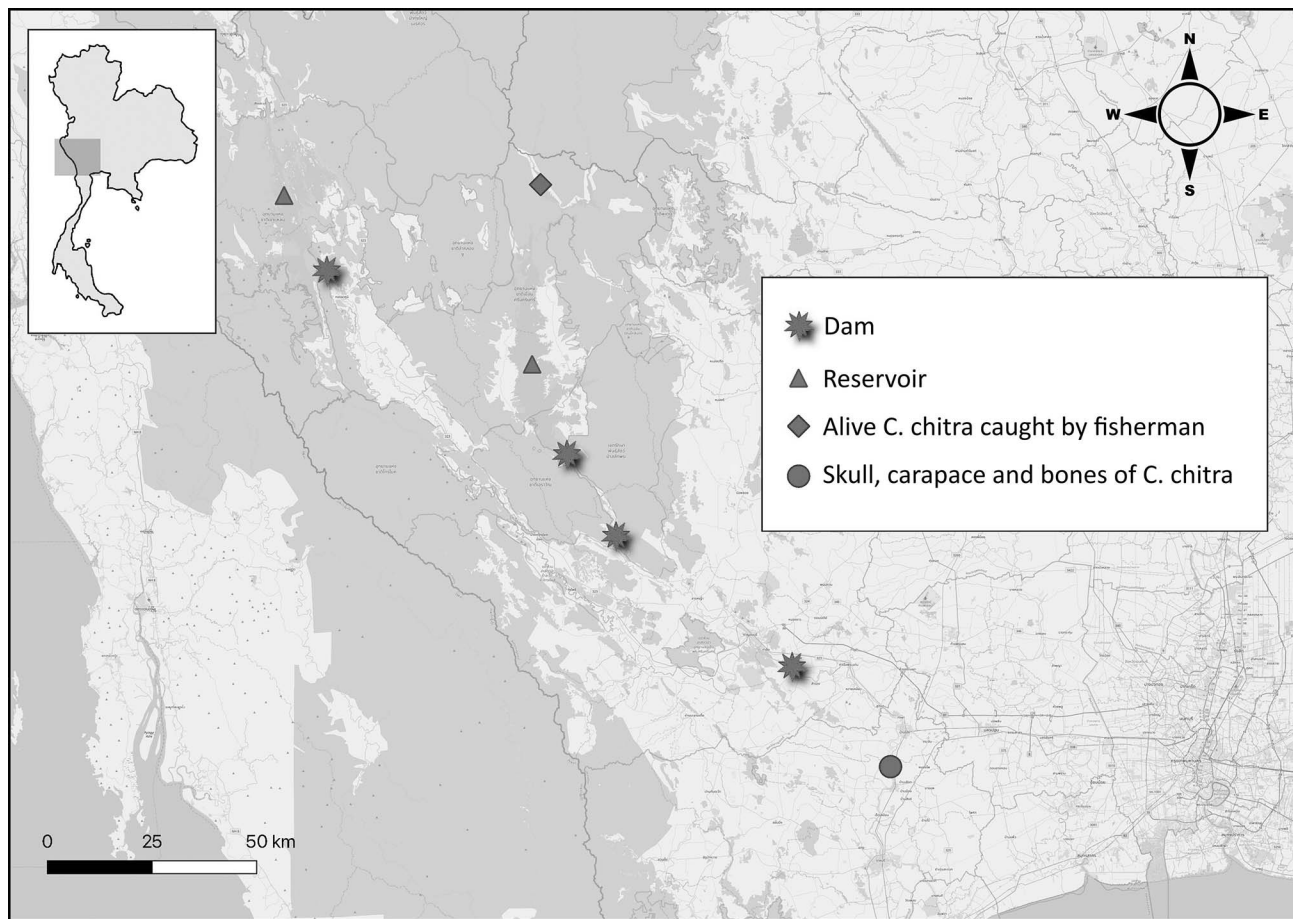
The Asian narrow-headed softshell turtle (*Chitra chitra*, Nutphand 1986) is among the world’s largest turtles, found in Thailand, Peninsular Malaysia, and Indonesia (Java) (Thirakhupt and Van Dijk 1994; Engstrom and McCord 2002; Engstrom et al. 2002; McCord and Pritchard 2002). The maximum recorded leathery carapace length was 123 cm in a female (Nutphand 1986) or 140 cm according to Turtle Taxonomy Working Group (2025), and a large female was weighed at 202 kg (Nutphand 1986). In Thailand, *Chitra* species are reported to occur in 3 out of 6 major river systems (Vidthayanon et al. 1997): the Salween, Mae Klong, and Chao Phraya rivers. More specifically, *C. chitra* has been documented in the Mae Klong River (Thirakhupt and van Dijk 1994) and is also reported to be found in the Mae Ping River, which forms part of the Chao Phraya River system (Kitimasak and Thirakhupt 2002). The Ping

River is one of 4 major tributaries that converge at Nakhon Sawan, after which their combined flow is known as the Chao Phraya River. Although *C. chitra* has been reported from the Chao Phraya, the river’s hydrology (muddy) and extensive anthropogenic alterations to both the main channel and its floodplain render the persistence of the species in this area questionable. Nonetheless, Kitimasak and Thirakhupt (2002) confirmed its presence based on a well-documented and referenced observation of a live male specimen that “was caught by the longline hook, usually used for *Mystus* spp., near the mouth of Mae Ping River at 15°43.020’N 100°08.632’E, Mueang district, Nakhon Sawan Province in June 1998”. For this species, there is also a single recorded occurrence from the Bang Pakong River in southeastern Thailand, based on a specimen collected in 1897 (Webb and van Dijk 2004). This locality represents a markedly distinct drainage basin from the above-mentioned ones. A second species, *Chitra vandijki*, is reported to inhabit the Salween River, which forms the border between Thailand and Myanmar, but the exact location of the specimens reported was unknown (Kitimasak and Thirakhupt 2002; Platt et al. 2021; Turtle Taxonomy Working Group 2025).

Asian turtles are threatened by habitat destruction, pollution, illegal trade, and overexploitation (Van Dijk et al. 2000; Engstrom et al. 2002; Shah and Tiwari 2004; Iskandar and Erdelen 2006; Platt et al. 2008; Buhlmann et al. 2009; Lovich et al. 2018; Stanford et al. 2020). *Chitra chitra* populations are decreasing (Kitimasak et al. 2005; Cota et al. 2019), and it is currently listed as Critically Endangered (CR) on the IUCN Red List (Cota et al. 2019). In Thailand, the ecological and conservation status of many turtle species, including *C. chitra*, remains poorly documented and inadequately understood (Van Dijk and Palasuwan 2000; Kitimasak et al. 2005). Data on population status and ecological requirements of *C. chitra* are severely limited. Notably, there have been no published records or confirmed sightings of the species in the country for more than 2 decades (Kitimasak et al. 2005).

In this paper, we report new records of *C. chitra* in Thailand to contribute to the species’ conservation at the national scale.

**Study Area and Methods.** — The field observations were obtained in the Mae Klong River Basin. This is one of Thailand’s 25 major river basins and is located in southwestern Thailand across Kanchanaburi and Ratchaburi Provinces (Fig. 1). The Mae Klong River is formed by the confluence of Khwae Yai and Khwae Noi rivers and flows into the Gulf of Thailand. Dams (Srinakarin, Vajiralongkorn [formerly Khao Laem], Tha Thung Na, and Mae Klong) regulate water flow, with the Mae Klong Dam supplying the Greater Mae Klong Irrigation Project, which irrigates the lower basin. Srinakarin, Vajiralongkorn, Tha Thung Na, and Mae Klong dams were, respectively, opened in 1981, 1986, 1982, and 1970 (Electricity Generating Authority of Thailand; Kitimasak et al. 2005); thus, the impacts of these dams



**Figure 1.** The Mae Ping and Mae Klong River Basin system including the Vajiralongkorn, Srinakarin, Tha Thun Na, and Mae Klong dams as well as Vajiralongkorn and Srinakarin reservoirs. *Chitra chitra* video and skeletal evidence (skulls, carapaces, bones) recorded during the present study are represented by red symbols. Made with Google Earth.

are 40 to more than 50 yr old. Dams present numerous challenges for turtle populations, including—but not limited to—disruption of upstream and downstream movements and the inundation of nests laid near the water’s edge following the release of impounded water (Thirakhupt and van Dijk 2004; Bárcenas-García et al. 2022). In addition, dams can lead to the permanent submergence of sandbanks that serve as essential nesting habitats and basking sites, and may alter the availability of prey or plant species utilized as forage.

Between 6 and 12 November 2024, we surveyed by boat approximately 180 km of river and reservoir habitats along the Mae Klong River system—including the Kwai, Kwai Noi, and Kwai Yai rivers—in Kanchanaburi and Ratchaburi provinces. During this period, we carried out informal interviews with local stakeholders, including fishers, farmers, university personnel, and government officials to determine whether any recent sightings of *C. chitra* had occurred in the area. These discussions were conducted using semistructured interview techniques, during which a consistent set of questions was posed to each participant: “Have you seen any large turtles in your area? How many species? Can you describe them? When was the last time you observed one? Where did you see it? Can you describe the habitat in which it was found?” In cases where the

respondent’s description of the turtle was ambiguous or unclear—particularly in response to the question regarding species identification—photographs of relevant turtle species were shown on a mobile device to aid in accurate identification. In cases of positive identification of *Chitra*, we consistently requested direct evidence, such as photographs, videos, or physical specimens (e.g., skulls, bones, or carapaces). *Chitra* is locally called “Ta Paab Maan Lai” (literally meaning ‘Boldly Striped Softshell Turtle’), whereas *Amyda*, the only other large-sized softshell species of the area, is called “Ta Paab Nam” (‘Water Softshell Turtle’) or, more frequently, “Ta Paab Tummada (or Thammada)” (‘Common Softshell Turtle’), so their identity and difference are well known by local people. Local contacts facilitated access to key informants and locations. Respondents remained anonymous, and discussions were conducted in Thai following verbal consent of the interviewee.

**Results: Confirmed Records.** — Our discussions with local residents yielded the first confirmed record of *C. chitra* in its historical Mae Klong range in more than 20 yr. A fisherman from Srinakarin Reservoir (Kanchanaburi Province) reported accidentally capturing a 79-kg adult *C. chitra* on 15 June 2024. Video evidence shows the specimen being weighed before escaping back into the water despite



**Figure 2.** Video screenshots documenting the accidental capture of a 79-kg *Chitra chitra* in Srinagarind Reservoir (A) being weighed, (B) put on the ground by the fisherman, and (C) escaping. Although uncertain, it seems that this individual was a female, based on the tail length.

attempts to restrain it (Fig. 2). The fisherman stated this was his first sighting of *C. chitra* in this location, though he noted this species' usual occurrence in a "restricted" or "protected area" of the Kwai Yai River, which connects to the reservoir.

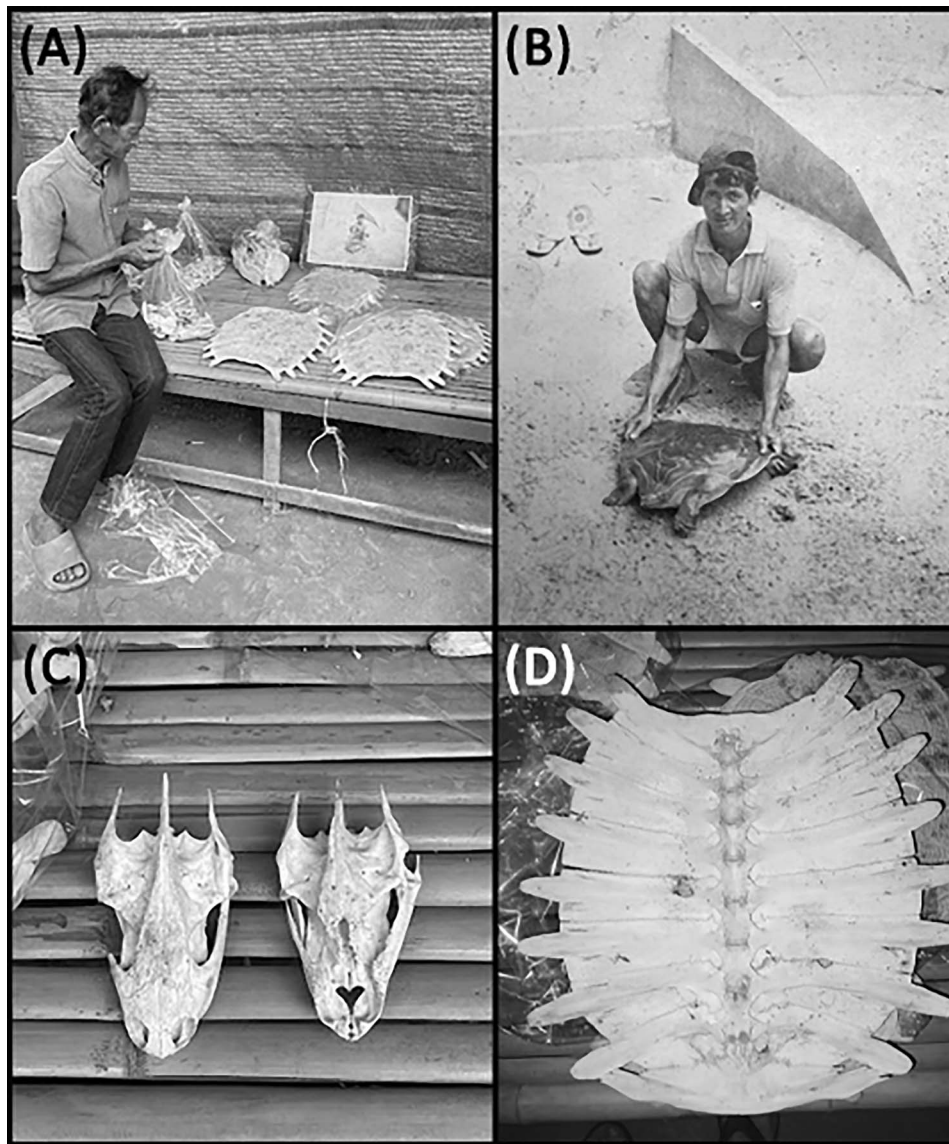
A former hunter contributed skeletal remains of *C. chitra*, comprising 3 skulls with associated carapaces and additional bones, as well as an extra shell (Fig. 3). All of these turtles were captured by longline hooks, at approximately 13°44'24.7"N, 99°50'30.8"E. Measurements were not taken from these skeletal remains. The former hunter also stated that his last *C. chitra* hunt at this site occurred in 2004 (Fig. 3B) but reported seeing an individual in the same area in 2023. The localization of the *C. chitra* video recording and skulls, carapaces, and bones recorded during the present study are given in Fig. 1.

**Results: Indirect Records.** — A fisherwoman from Srinakarin Reservoir claimed to have captured juvenile *C. chitra* (hand-sized) in stationary nets. Another fisher also reported discovering 4 juveniles 25 yr ago in the same area. In the Kanchanaburi City section of the Mae Klong River, local fishers denied ever encountering *C. chitra*. However, in the Ratchaburi Province section, some fishers reported the species' continued presence, although their perception is that it has become significantly rarer compared to a few decades ago.

Fishers described *C. chitra* habitats as deep-water river environments. However, they identified sandy-grass areas along the riverbanks and sandbanks as key habitats for nesting. Several fishermen noted rapid human settlement

expansion, including tourism infrastructure, and sand dredging, which may impact the species. Additionally, some reported declining water quality due to industrial waste, and the prevalence of illegal fishing practices such as unauthorized fishing periods and destructive methods like electrofishing or poisoning.

**Discussion.** — Overall, our short-term study, although just reporting on a week's unstructured interview survey work and recording 2 previously unrecorded records well within the known distribution area, is of some interest given the very scarce knowledge on the current status of *C. chitra* in Thailand. Despite confirmation of its presence in its historical range, discussion with fishers revealed possible crash of *Chitra chitra* population in freshwater environments affected by environmental degradation, as observed in other turtle species (e.g., Claude et al. 2019; Stanford et al. 2020). The Mae Klong River in Kanchanaburi City is characterized by an urbanized environment, where local fishers have reported no encounters with *C. chitra*. In contrast, within the Mae Klong River at Ratchaburi Province, fishers have confirmed the presence of *C. chitra*, albeit in lower abundance than in the past. At the Srinakarin Dam and Reservoir (Kanchanaburi Province), multiple fishers have recently observed or inadvertently captured both adult and juvenile *C. chitra*. In this context, it is noteworthy that Thirakhupt and Van Dijk (1994) reported that, within the first 50–80 km downstream of a mega-dam, water temperatures are lower and dissolved oxygen levels reduced compared to the natural river conditions. Additionally, dam releases



**Figure 3.** Photos of (A) skeletal remains, (B) a specimen captured about 20 yrs ago at the study area, (C) skulls, and (D) carapace of *Chitra chitra* from a former hunter in Ratchaburi Province.

exacerbate riverbed scouring, leading to the degradation of sandbank habitats preferred by the species. With respect to the present study area, seminatural riverine conditions exist only in Ratchaburi. Historical records also indicate that the records of this species from 1997 to 2001 within the Srinakarin Reservoir (Kitimasak and Thirakhupt 2002; Kitimasak et al. 2005; Van Dijk and Thirakhupt 1995) are similar to the recent observations provided in this paper. These findings showed the reservoir may serve as viable habitat for *C. chitra* at least occasionally, with the sightings of juveniles also suggesting that it may also be a nesting area. Therefore, conservation actions should be targeted at this area too. However, it is probable that the species' preferred habitat is located within the large tributaries feeding into the reservoirs, such as the upper Kwai Yai and Huai Khae Khaeng rivers. These tributaries lie within strictly protected wildlife sanctuaries, where commercial fishing—and consequently bycatch—is absent. As a result, conducting

surveys in these areas would require substantial planning and logistical effort.

Although further research on species distribution and habitat preferences of *C. chitra* in Thailand is essential—particularly with regard to habitat protection and the development of sustainable breeding programs—targeted conservation recommendations for this species have already been outlined in the IUCN Red List assessment (Cota et al. 2019) and should be strictly implemented at the national level. Given the rarity and elusiveness of *C. chitra* (as well as of many other large-sized Trionychidae species), effective data collection requires the application of multiple complementary methods (e.g., Luiselli et al. 2024a, 2024b; Le Duc et al. 2025). In this context, local ecological knowledge obtained through structured face-to-face interviews, has proven particularly valuable—especially in short-term studies where direct observation is limited (e.g., Luiselli et al. 2021; Luiselli 2024). Our findings demonstrate the feasibility of this

approach for *Chitra*, as there was substantial agreement between verified records and the information provided by local interviewees, even when the latter could not be substantiated by physical evidence such as photographs or videos.

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