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Amphibian and Reptile Conservation of Nepal

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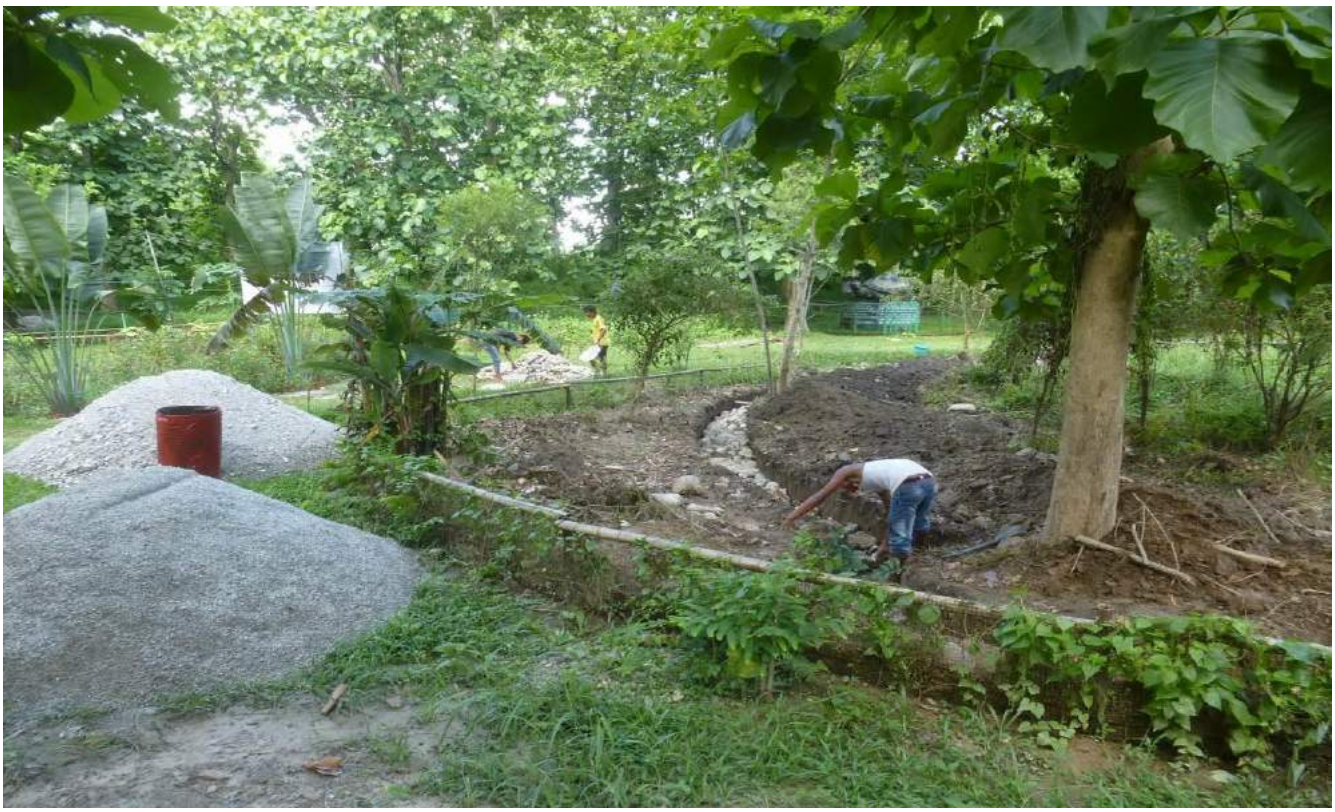
Latest constructions at the TRCC Budo Holi / SE-Nepal – a photo documentation

After the handing over ceremony of the Turtle Rescue & Conservation Centre on April 6th , 2018 to SUMMEF and the Jhapa Municipality, SUMMEF started the concrete wall and fenced enclosure building for the 260 sqm earthen pond. The construction of a second floor building for the central office and guesthouse complex was realized and finished in time. Also the tortoise area needed a reconstruction as corrosion with the steady humidity rotted the previous construction, the show aquaria received a proper roofing avoiding leaf litter and other debris falling into these aquaria. Also the TRCC lake got fencing finalized and a new cemented inlet.
We show and document here gratefully the great work carried out by the Park management and SUMMEF.

The roof of aquaria were all ruined up and looked ugly with lots of complaints from visitors. Now, it is replaced with permanent fibre (bad conductor) roof.

The former earthen pond received concrete walls, fencing and a sand bank for egg laying for bigger softshell turtles like *Chitra* and *Nilssonia* spp.

SUMMEF has constructed 1st floor at main TRCC building. Altogether there are four rooms and one bathroom; two rooms in the left are connected to make a Seminar hall and remaining two rooms on the right are prepared as separate living room for guests.



The foundation for the tortoise enclosure (*Indotestudo elongata*, *Melanochelys tricarinata*) was done thoroughly.

The finalized terrestrial turtle enclosure at TRCC

The TRCC lake with its three islands, wide shore line and aquatic vegetation became a great habitat for free roaming terrapins and softshells.

New inlet (above) and outlet of TRCC lake with new fencing around whole lake

World Turtle Day 2019 celebrated at TRCC

TRCC (ARCO-Nepal & SUMMEF) is the first and only organization to celebrate 'World Turtle Day' in Nepal and the program would be a national celebration having coverage in prominent Media.
Participation of numerous people in turtle conservation and also increase of visitors at SUMMEF Park were our successful results as many people are unaware of turtle conservation needs.

Fourth TRCC Volunteer's Day – 2019 (February 10th) and World Environment Day (June 5th) and interactions with school children

'Turtle Rescue and Conservation Centre – TRCC' has been organizing its very own Volunteers Days on every 27 Magh, 10th February since 2016 AD. This year as well it has successfully organized fourth TRCC Volunteer's Day doing several selfless contributions by the participants. For the volunteering, in particular bachelor fourth year student's (Environmental Science) of Mechi Multiple Campus from Bhadrapur, Jhapa were invited. Interestingly, the same day coincided with Saraswati Puja 'Goddess of knowledge' and the volunteer students were engaged at campus till noon. The positive aspect is there were innumerable visitors (mostly school level students) at TRCC due to public holiday.

Group photo with volunteers

- ✓ Continuation of Signature campaign 'Save Endangered Turtles of Nepal'
- ✓ Entry of visitors at TRCC main gate and briefing about the program
- ✓ TRCC Exhibition and Sales
- ✓ Creating awareness to visitors
- ✓ Educating school children

To achieve 100% in manual work is always a challenge. However, the dedicated volunteer's physical effort was praise worthy. Breeding Center was completely filled with sand by TRCC staff and volunteers.

TRCC staffs carrying sand to breeding centre

Volunteers at work

Basically, the volunteering program was divided into Formal and Informal. In formal program, TRCC-Turtle's Club was reformed by TRCC representative in presence of SUMMEF park manager. A dynamic club of 12 members in coordinator-ship of Sabin Adhikari was formed. The members are Aakanksha Gautam, Terisa Tamang, Ganita Subba, Shraddha Bhattarai, Manjita Kharel, Asmita Niroula, Samila Subba, Rozza Rai, Menuka Rajbanshi, Ashok Khatiwada and Ramit Bista. Sabin has been volunteering persistently at TRCC for several years. TRCC Representative handed a register (to document the club activities) and ARCO Turtle vest to new Coordinator.

At the end of day, snacks were served to volunteering students as an appreciation by TRCC representative and gave good wishes for their brighter ahead.

We had wonderful days with volunteering friends, students and helpers at TRCC.

At the same program ARCO student membership cards were provided to Sabin Adhikari and Aakankasha Gautam. At the last part of formal program the volunteers were presented with a souvenir of large printed photo of turtles of TRCC. The printing expense was supported by TK Co. The informal program was sub-divided as Non-manual and Manual.

Interactions with youngest school children at TRCC – creating sensitivity from the first steps towards turtle conservation

by Tapil P. Rai

Reassessment of Herpetofauna from Jhapa District, East Nepal

Abstract

Jhapa district is located at Southeast of Nepal in Province-I and the elevation ranges from 58 to 500 masl. It has around 60 community forests and numerous wetlands that function as suitable habitat for amphibians and reptiles. However, there are limited researches on the herpetofauna of Jhapa and the first formal checklist was prepared by RAI (2004). Half of the turtle species found in Nepal (9 out of 18) are documented from Jhapa (RAI, 2006). Besides, it is one of the most affected districts for venomous snake bite (SHARMA, 2003) and to know about its distribution is crucial. The opportunistic survey was carried out between January 2018 and June 2019. Random transect method in forest trail and streams covering a distance of 7 m on both sides was executed. Secondary data were gathered from snakebite treatment centre, science colleges and forest personnel. *Hylarana taipehensis* is recorded after 41 years (DUBOIS, 1978) from Birtamode, Jhapa. Three new species of snakes have been added to the checklist and became updated with 20 amphibians and 36 reptiles for Jhapa. Numerous wetlands and dense forests of Jhapa district entail systematic research to enhance the inventory of the herpetofauna.

Key words: Herpetofauna, Jhapa district, inventory, venomous snakes

Introduction

Jhapa district is located in Province-I of the eastern region of Nepal that connects with West Bengal (India) to the east, Morang district to the west, Ilam district to the north and Bihar (India) to the south. It has eight municipalities and 7 rural municipalities (District Coordination Committee Office-Jhapa, 2019). The total area of Jhapa is 1,606 km2 with lowest elevation point of 58 m in Kechana Kawal (also the lowest point of Nepal) and reaching the highest elevation of 500 m at Krishnathumki. Topographically, it is located at latitude 26°20' to 26°50' North and longitude 87°39' to 88°12' east. Jhapa consists of different river systems like Mechi, Kankai, Biring, Deoniya, Ratuwa, etc and many wetlands like Kechana, Biratpokhar, Budoholi, Jamunkhadi, Chawni, Indreni taal, Chillaghad, etc. The research area comprises of about 60 Community Forest User Groups (CFUGs) with prominent forests like Jalthal, Telpani, Bahuban, Hachuwamasa, Charali, Dahijhoda, etc.

History

Geologically, Indian plate pushed below the margin of Eurasia some 35 million years ago, and the gigantic pressure from the south lead to the formation of the Himalayan Range (KÄSTLE et al., 2013). As a resultant, fauna of Indian, Indo-Chinese and Malayan subregions are found in Nepal (DAS, 1996). In Nepal, research and conservation effort on herpetofauna has given less priority (SCHLEICH & KÄSTLE, 2002) except a few ones like *Gavialis gangeticus* and *Python*. More than 150 years ago GÜNTHER, based on Hodgson's collections between 1826 and 1854 is a pioneer to study herpetofauna of Nepal (RAI, 2004). After that SMITH (1951), SWAN & LEVINTON (1962), DUBOIS (1974, 1984), NANHOE & OUBOTER (1987), ZUG & MITCHELL (1995), SCHLEICH & KÄSTLE (1998, 2002), SHRESTHA (2001), RAI (2004), SHAH & TIWARI (2004), ARYAL et al. (2010) and KÄSTLE et al. (2013) are mentionable. Amphibians and reptiles of the world are one of the most threatened vertebrates and suffering declines and extinctions (GIBBONS et al., 2000; KIESECKER et al., 2001; STUART et al., 2004; MCCALLUM, 2007). The major threats to reptile populations are habitat loss and degradation, introduced invasive species, environmental pollution, disease, unsuitable use, and global climate change (GIBBONS et al., 2000). Herpetofauna has immense importance ranging from ecology to cultural value (SHRESTHA, 2001; SCHLEICH & KÄSTLE, 2002; SHAH & TIWARI, 2004; KÄSTLE et al., 2013).

Methodology

The survey was carried out for one and half year beginning from January 2018 and ending at June 2019. The sampling method of amphibians and reptiles was based on EEKHOUT (2008). Visual Encounter

Survey (VES) was done at major forests and wetlands of Jhapa. Random transect method in forest trails and streams covering a distance of 7 m on both sides was executed.

Three snakebite treatment centres of Jhapa (Charali, Damak and Surunga) were visited and the preserved specimens analyzed. Resource persons at Bahundagi, Charali, Sanischare, Birtamode, Danabari**,** Bhadrapur, Jalthal, Korobari, Kankai and Damak were allotted to collect the information on herpetofauna. Garmin GPS Oregon 300 was used for recording location and digital camera was used for photographic documentation. SMITH (1969), PRITCHARD (1979), DANIEL (1983), TIKADER & SHARMA (1992), SCHLEICH & KÄSTLE (1998, 2002), SHRESTHA (2001), CHANARD et al. (1999), RAI (2004), SHAH & TIWARI (2004), DANIELS (2005), RAI (2011), KÄSTLE et al. (2013), KIESL & SCHLEICH (2016) and DAS & DAS (2018) were used for identification of herpetofauna species**.**

Map of Nepal showing Jhapa district (red) in Southeast Nepal (Modified after Google Maps)

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Results and discussion

After a thorough research of one and half years the following checklist has been reassessed as shown in Table 1. Twenty amphibians were recorded through literature survey and no new record of amphibians from the research area was available. However, *Hylarana taipehensis* (Photo 1) was documented from Jhapa after 41 years (DUBOIS, 1978). It was first recorded by DUBOIS in Nepal from Birtamode, Jhapa in 1978 and secondly by SCHLEICH in 2002 from Ghoda Ghodi Taal of western Nepal (SCHLEICH & KÄSTLE, 2002). According to previous literature 33 species of reptiles were recorded from Jhapa and this research has added 3 new species to the checklist viz. *Coelognathus helena*, *Sinomicrurus macclellandii univirgatus*, *Trimeresurus septentrionalis.* Those new recorded species were compared with similar species; *Hylarana taipehensis* / *H. nigrovittata*, *Coelognathus helena* / *C. radiatus* and *Trimeresurus septentrionalis* / *T. tibetanus* for confirmation. *Coelognathus* is a mildly venomous snake (KÄSTLE et al., 2013), while *Sinomicrurus* and *Trimeresurus* are venomous snakes and thus increasing the list of venomous snakes found in Jhapa.

Table 1: Checklist of herpetofauna in Jhapa district (a) Literature survey and (b) Inventory of research

(a) Literature survey			
Amphibia	**Author/s**	**Reptilia**	**Author/s**
Uperodon taprobanicus, U. globulosus, Hylarana nigro-vittata, Microhyla ornata, Polypedates maculatus, P. leucomystax, P. taeniatus, Hoplobatrachus tigerinus, H. crassus, Euphlyctis cyano-phlyctis, Zakerana pierrei, Z. teraiensis, Z. nepalensis, Z. syhadrensis, Sphaerotheca breviceps, S. rolandae, Duttaphrynus melanostictus, D. stomaticus n = 18	SCHLEICH & KÄSTLE (2002), RAI (2004), RAI (2011), KÄSTLE et al. (2013)	*Cyclemys gemeli, Melanochelys tricarinata, Pangshura flaviventer, Indotestudo elongata, Lissemys punctata* n = 5	SCHLEICH & KÄSTLE (2002), RAI (2004), KÄSTLE et al. (2013), RAI (2017)
Microhyla taraiensis n = 1	KHATIWADA et al. (2017)	*Calotes versicolor, Gekko gecko, Hemidactylus flaviviridis, H. brookii, H. frenatus, Eutropis carinata, Varanus bengalensis, V. flavescens, Amphiesma stolatum, Dendrelaphis tristis, Coelognathus radiatus, Enhydris enhydris, Lycodon aulicus, Oligodon albocinctus, Ptyas mucosa, Xenochrophis piscator, Bungarus caeruleus, B. fasciatus, B. lividus, Naja kaouthia, N. naja, Indotyphlops braminus* n = 22	SCHLEICH & KÄSTLE (2002), RAI (2004), KÄSTLE et al. (2013)
		Ophiophagus hannah n = 1	RAI (2004) on the basis of manuscript of SHAH, K. B.
		Nilssonia gangeticus Jhapa (BPP, 1995) *Chitra indica* Kechana Jheel (HS, 1998) *Melanochelys trijuga* Kankai River (KRR, 2001) *Nilssonia hurum* Chauni, Kechana, Kachudaha, Damak (KRR, 2006) n = 4	BPP (1995), RAI (2006), KHAREL (2011)
		Oligodon kheriensis n = 1	PANDEY et al. (2016), RAI (2018)

(b) Inventory of research			
*Hylarana taipehensis** n = 1	*Reconfirmation of species after 41 years from Jhapa	*Coelognathus helena*, *Sinomicrurus macclellandii univirgatus*, *Trimeresurus septentrionalis* n = 3	New records
Total = 20		Total = 36	

Acronyms used: BPP = Biodiversity Project Profile, HS = Hermann Schleich, KRR = Kalu Ram Rai

Jhapa district is one of the most affected districts for venomous snake bite with several casualties every year (SHARMA, 2003). King cobra or Hamadryad *Ophiophagus hannah* is mentioned by RAI, K. R. (2004) from Rajbiraj on the basis of manuscript of SHAH, K. B. but did not include it in the checklist of Jhapa. In consideration of this reference few researchers (THAPA et al., 2019) have considered the occurrence of king cobra from Jhapa. Previous publications have documented 9 species of turtles from Jhapa and during the research period only 4 species viz. *Indotestudo elongata*, *Cyclemys gemeli*, *Lissemys punctata* and *Nilssonia hurum* have been recorded with live voucher specimens. Critically endangered *Indotestudo elongata* are still found in Sal forest of Jhapa and necessitates immediate conservation efforts from government to community level. It might be that the threatened species *Chitra indica* and *Nilssonia gangeticus* have been wiped out from the area due to human encroachment and habitat loss. Damming of Kankai river and channeling of water for irrigation purpose has decreased volume of water and as a consequence these big species of turtles could not survive (RAI, 2006; KHAREL, 2011). Excessive excavation of earth material like sand, gravel and stones from river damages the basking and nesting areas of Geoemydid and Trionychid turtles. Such adverse effects (for *Cyclemys*) have been clearly observed in Biring and Tangting river of Arjundhara Municipality. Likewise, the population of *Melanochelys tricarinata*, *M. trijuga* and *Pangshura flaviventer* if still present should have been very much decreased in size due to rapid loss of forests and wetlands. Among 18 species of turtles that possibly might occur in Nepal (KIESL & SCHLEICH, 2016), 10 species are categorized as threatened by International Union for Conservation of Nature (IUCN). As such, an intense research on the current status of turtles in Jhapa is vital for successful conservation that ensures its survival.

Reconfirmation of *Hylarana taipehensis* VAN DENBURGH, 1909

Ranidae
English: Taipei frog, Two-striped grass frog
Nepali: Taipei bhyaguto, Dui dharkay ghassay bhyaguto
Place of find: Salbari, Arjundhara Municipality-11, Jhapa
GPS coordinates: 26°40'26.2"N, 088°00'56.3"E **Elevation:** 153 m
Date: 2019/5/7

Taipei frog

Its distribution in Nepal is known from only two localities in the western and eastern Terai; Ghoda Ghodi Tal (ANDERS, 2002, SCHLEICH, 2002) and Birtamode (DUBOIS, "1978" 1980) respectively. The specimen is found 4 kilometers northeast aerial distance from Birtamode Mukti Chowk after 41 years. Its habitat is edge of *Shorea robusta* forest with a nearby source of water and paddy field. It is a small frog with a torpedo-shaped body, elongate head, well developed digital pads on fingers and dorsolateral and lateral folds (SCHLEICH & KÄSTLE, 2002; KÄSTLE et al., 2013). Dorsal coloration is greenish to bluish grey, with yellowish lateral line running in between black lines from eye to the cloaca region. The specimen's Snout Vent Length (SVL) is 27 mm, its relative finger length is 1 ≤2<4<3 and relative toe length is 1<2<3<5<4 which is exactly like that given by SCHLEICH & KÄSTLE (2002).

New records of hepetofauna

Coelognathus helena DAUDIN, 1803

Colubridae (Non-venomous or mildly venomous)
English: Common trinket snake
Nepali: Gahane sap, Malay sap
Place of find: Bhadrapur Municipality-6, Jhapa
GPS coordinates: 26°32'57"N, 88°05'14"E **Elevation:** 80 m
Locality records: Hetauda,, Kasarah, Naudanda, Pokhara, Sanepa, Tansen, Sunsari (SCHLEICH & KÄSTLE, 2002; SHAH & TIWARI, 2004)
Date: 2018/2/15

Juvenile of common trinket snake and dorsal view of head (bottom right corner)

The specimen is recorded from human settlements i.e. premise of school in Bhadrapur. Its preferred habitat is scrub zones of rain forest edges, paddy fields, edge of meadows and especially in the vicinity of water. Maximum total length is 168 cm with basic color of brown to olive; on the anterior part of the body several transverse rows of pale yellow blotches, bordered with black are interrupted in the vertebrae area. The neck is patterned by two dark narrow stripes, but without a dark transverse spot (SCHLEICH & KÄSTLE, 2002; KÄSTLE et al., 2013). As an antipredator behavior it inflates with lateral compression of the neck and strikes. In rare cases its bite causes pain at the site of bite, blood oozes from the puncture, and the clotting time takes as long as 30 minutes (KÄSTLE et al., 2013).

Sinomicrurus macclellandii univirgatus GÜNTHER, 1858

Elapidae (Venomous)
English: MacClelland's coral snake
Nepali: Rato sarpa, Muga sarpa, Nag
Place of find: Birtamode Municipality-5, Jhapa
GPS coordinates: 26°38'32.6"N, 087°59'57.8"E **Elevation:** 125 m

Locality records: Chitwan National Park, Ilam, Kathmandu, Pokhara, Swyambhu (SCHLEICH & KÄSTLE, 2002)
Date: 2019/2/27 [Note: Label in museum specimen shows that snake bit the victim in 2015/6/23 at 10 pm.]

Preserved specimen of MacClelland's coral snake

It inhabits hills with rich vegetation; however the specimen is recorded from Birtamode Municipality-5 at an elevation of 125 m. The head is black with a well-defined broad white, yellow, or cream-colored transverse bar behind the eyes and the venter is yellowish or yellowish-white with black cross bands or irregular blotches and, rarely has only a median black band (SCHLEICH & KÄSTLE, 2002; KÄSTLE et al., 2013). It is commonly described as shy, inactive and does not attempt to bite, but it has been reported by several researchers on the fatality of its bite (SCHLEICH & KÄSTLE, 2002).

Trimeresurus septentrionalis KRAMER, 1977

Viperidae (Venomous)
English: Northern white-lipped pit viper
Nepali: Seto jibre hareu sap
Place of find: Arjundhara Municipality-11, Jhapa
GPS coordinates: 26°38'59"N, 88°1'35"E **Elevation:** 120 m
Locality records: Bahundanda, Beni, Chitwan National Park, Dhakur pokhari, Gurjakhani, Hyangja, Kathmandu, Manang, Mustang, Myagdi, Pokhara, Rasuwa, Suikhet, Syarpagaon, Tatopani, Tangjet, Udayapur, Khotang, Okhaldhunga, Bhojpur, Dhankuta, Terathum, Ilam (SCHLEICH & KÄSTLE, 2002; RAI, 2004)
Date: 2018/8/18

Northern white-lipped pit viper (adult)

It lives in diverse habitats; mainly in open tropical forests, along the boundary between primary forests and open bamboo thickets, in open bush-covered places, on sunny and grassy hills and slopes, in plantations and cultivated areas. The specimen is recorded from human habitation in Arjundhara Municipality-11 at an elevation of 120 m. Maximum total length for male is 75 cm and female is 104 cm (SCHLEICH & KÄSTLE, 2002; KÄSTLE et al., 2013). The dorsum is mostly green, the iris is yellow to pale red, yellowish-brown or orange. The color below the eyes is green or bluish green. The end of the tail is mostly reddish-brown dorsally sometimes dark bluish grey.

Conclusion

The present research has reassessed the checklist of Jhapa with 20 amphibians and 36 reptiles. No new species of amphibian was recorded but *Hylarana taipehensis* was reconfirmed from Jhapa after 41 years and is the third record for Nepal. Three new records of snakes, viz. *Coelognathus helena*, *Sinomicrurus macclellandii univirgatus* and, *Trimeresurus septentrionalis* have been added in the checklist. *Sinomicrurus* and *Trimeresurus* are venomous snakes and should be included during the awareness campaign by local authorities on snakebite besides cobras and kraits in the region. *Coelognathus helena* is mildly venomous and precautions should be taken while handling it. Distribution of world's longest venomous snake *Ophiophagus hannah* in Jhapa necessitates distinct information. Literature has documented 9 species of turtles from Jhapa and during the research period only 4 species were recorded alive. As turtles are among the most endangered vertebrates further research on the status of turtles of Jhapa is crucial. Prominent wetlands, Jalthal forest and dense community forests in northern Jhapa that connects with forest of southern Ilam district requires intensive research in an institutional way to enhance inventory of herpetofauna. At present it has almost become impossible to go inside the majority of forests due to presence of wild elephants (*Elephas maximus)*.

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Escape trial of C*yclemys* at the TRCC (photo: Tapil P. Rai)

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