

## Fresh water Turtles and Tortoises of Orissa

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### Introduction

Orissa, situated in the Eastern border of India, is located between the parallels of 17°49'N and 22° 34'N latitudes and meridians of 81° 27'E and 87° 29'E longitudes. The state is bounded by the Bay of Bengal on the east, West Bengal in north, Jharkhand and Chhattisgarh on the west and Andhra Pradesh on the south with a coastline of 482 km. Physiographically the state can be divided into three broad regions, such as, the coastal plains, the middle mountainous ranges and the rolling uplands (Sinha, 1971). The coastal region is the combination of several deltas of varied sizes and shapes formed by the major rivers of Orissa, such as the Subarnarekha, the Budhabalanga, the Baitarani, the Brahmani, the Mahanadi, and the Rushikulya. The mountainous region covers about three-fourth of the state and can be broadly divided into two groups; the Similipal massif and the Eastern Ghats. The rest of Orissa comprises plateaus and rolling uplands at the west of Eastern Ghats, which are 150-300m in elevation and flat in nature. Due to abundant perennial supplies of fresh water, the state has many reservoirs, lakes, rivers and streams, which serve as ideal habitats for fresh water turtles (Plate 8.2 E). The rivers which flow through Orissa in to Bay of Bengal can be divided broadly into four groups based on sources, such as, rivers having source outside the State (the Subarnarekha, the Brahmani and the Mahanadi); rivers having a source inside the State (the Budhabalanga, the Baitarani, the Salandi, and the Rushikulya); rivers having a source inside Orissa but flow through other states (the Bahudu, the Vansadhara, and the Nagavali) and rivers having a source inside Orissa, but tributary to rivers flowing through other states (the Machkund, the Sileru, the Kolab, and the Indravati). Apart from these, there are a few big reservoirs like Hirakud, Balimela, Indravati and many small to medium dams like Rengali over Brahmani, Naraj over Mahanadi, Mahindra over Sankh etc. in the state, serving as potential turtle habitats. Orissa also has one fresh water lake, Ansupa and a brackish water lagoon Chilka. Nevertheless, many species of turtles are also inhabitant of forests, hill streams and stagnant water bodies like ponds and ditches.

The chelonian fauna of Orissa comprises 17 species, four marine, eleven fresh water turtles and two land tortoises. Documentation of fresh water turtles, specifically in Orissa, dates back to Annandale (1907), where he mentioned about *Emyda vitata* Peters (= *Lissemys punctata granosa*) from Gopakuda Island of Chilika lake. Subsequently, Annandale (1912) in his work on turtles from river Mahanadi and tributaries reported four species including a new subspecies, *Trionyx gangeticus mahanaddicus*, which was later synonymised by Smith (1931). He also recorded *Nilssonina leithii* from Mahanadi river. Biswas *et al.* (1978) mentioned about two specimens of *Indotestudo elongata* collected from Puri and Similipal. Vijaya (1982) reported *Peleochelys bibroni* and *Batagur baska* from the river mouth at Gahirmatha coast of Bhitarkanika Wildlife Sanctuary. Moreover, in the herpetofaunal checklist provided by Dutta and Acharjyo (1990, 1993 and 1997) they reported four species of marine, ten species of fresh water turtles and two species of tortoises from Orissa. From Bhitarkanika wildlife sanctuary Chadha and Kar (1999) reported ten species of turtles including three marine species and mentioned the nesting sites of *Peleochelys bibroni* in the sandpit at Ekakula in the estuary side. Natural history information on *Nilssonina gangetica*, *N. leithii* and *Pangshura tentoria* was provided by Biswas and Acharjyo (1984a) based on the animals collected from different parts of Orissa and brought to Nandankanan Biological Park. Study on captive population of *Geochelone elegans* in Orissa was carried out by Biswas and Acharjyo (1984b). On the ecological aspects, Singh (1985) worked on terrestrial activity of *Pangshura tentoria* in river Mahanadi. Dutta (1990) provided an overview of ecology, natural history and conservation of herpetofauna of the state and raised the concern for conservation of some of the fresh water turtles of Orissa. Recently, Dutta *et al.* (2009) reported four species of hard-shell fresh water turtles, one species of tortoise and one species of soft-shell fresh water turtle from Similipal Biosphere Reserve. The authors reported *Melanochelys tricarinata* from Similipal, which was first



report from Orissa and provided notes on habitat, natural history and distribution of the species occurring in the Biosphere reserve.

However, in comparison to the enormous amount of research carried out on marine turtles, the less glamorous but not less important fresh water turtles of the state have not attracted the attention they deserve. The current study provides updated checklist of the fresh water turtles and tortoises of Orissa with their distribution and natural history information.

### Methodology

The study was carried out during May 2004 till June 2009 with the aim to record the distribution and conservation status of fresh water turtle and tortoise species in Orissa. Field surveys were carried out randomly throughout the state and at selected observation points in the Mahanadi River and its distributaries of Kathjodi, Devi, Kandala, Paika, Chitrotpala and Luna rivers. In some forested areas day and night surveys were carried out to find out turtle species. Hideouts like bushes, leaf litters, gaps in large rock boulders and gaps in roots of large trees were searched for hiding or hibernating turtles or tortoises. Hill stream beds and river banks were surveyed to search for turtle tracks, following which sometimes yields the specimens. Besides, the fishermen and local communities were interviewed and the fresh water turtle species were identified from the by catch of fishermen. Sporadic records of seizure of turtles and market survey were conducted during the study period to assess the threat to some of the species due to trading. Basking turtles were spotted from a distance by binoculars from boat or by walking along the bank. Species identification was done following Das (2002). Dead turtle specimens and turtle carapace were identified following Smith (1931).

### Systematic account of Fresh water turtle and tortoise species of Orissa

#### Order: Chelonia

#### Family: Bataguridae

***Batagur baska* (Gray, 1831):** An estuarine species living mostly in shallow, muddy tidal regions at river mouths lined with mangroves or other vegetation. In Orissa, this species is reported only from the estuaries of Bhitarkanika wildlife sanctuary. Das (2002) and Chadha and Kar (1999) provided some account on natural history of the species. Though this species is believed to be extinct from Orissa but latest reports from local fishermen of Kendrapada district indicate that a population might inhabit the estuarine areas of the Mahanadi delta. Fishermen also report that they were abundant about a decade ago.

***Pangshura tecta* (Gray, 1831) (Plate 8.1 A):** This species was reported from up-stream rivers away from the mangrove swamps in the fringe areas of Bhitarkanika wildlife sanctuary (Chadha and Kar, 1999). It is also found in down streams of Mahanadi river at Munduli, Kakhadi, Cuttack and also in some places of Kathajodi river. This species is most common in the northern part the state in Balasore and Mayurbhanj districts and is reported from Subarnarekha, Budhabalanga, Deo, Salandi and Palpala rivers (Dutta *et al.*, 2009.). It is also an inhabitant of ponds in Balasore and Mayurbhanj districts and lives in sympatric with *Lissemys punctata*. A clutch of 1-6 eggs are laid during the winter months in sandy or muddy banks of the water bodies.

***Pangshura tentoria* (Gray, 1834) (Plate 8.1 B):** This species is represented by the subspecies *P. tentoria tentoria* (Gray, 1834) in Orissa. It is found throughout Mahanadi, Brahmani, Baitarani, Budhabalanga, Subarnarekha and Tel rivers. This species is the most common by-catch during fishing activities in river Mahanadi and of late there is a nascent demand for its shells for the poultry feed industry. We have found local trappers being induced by traders to catch such turtles, which are otherwise inedible. Nesting takes place during the months of November to January in the sandy river banks. In ponds and marsh lands the species is seen to nest on the mud bank. A clutch of 1-10 eggs are laid by digging nearly 300 mm pit. The eggs are consumed by the people and other predators like dogs and Jackals.

***Melanochelys trijuga* (Schweigger, 1812) (Plate 8.1 C):** This species is represented by the subspecies *Melanochelys trijuga indopeninsularis* (Annandale, 1913). It is a forest dwelling species living in dry deciduous, moist deciduous and semi evergreen forests near water bodies or swampy grasslands. Das and Bhupathy (2009) showed the distribution of the species only in Northern Orissa. During this study we recorded the species from Similipal Biosphere Reserve, Mayurbhanj district; Ranapur, Nayagarh district; Kapilas, Dhenkanal district; Daringbadi, Boudh district; Mahendragiri, Parelakhemundi and forested areas of Rayagada district. Breeding takes place during monsoon season and egg lying was observed during November. A clutch of 8 eggs was recorded from

a female of carapace length 330 mm in captivity. It is omnivorous and readily takes vegetables, prawns and snails (*Acatina fulica*) in captivity (*pers. obs.*).

***Melanochelys tricarinata* (Blyth, 1856) (Plate 8.1 D):** The species was earlier reported from Chainbasa of Jharkhand district (Blyth, 1856). Das (2009) recorded the distribution of the species in a relatively narrow sub-Himalayan belt. Dutta *et al.*, (2009) reported a large population from the swampy grassland and meadows of Upper Barhakamuda in the Similipal Biosphere Reserve. Recently, a specimen was found in Ranapur forest of Nayagarh district extending its range in Eastern Ghats of Orissa. It is mostly active during night time; captive individuals feed on vegetables, wild fruits, different species of snails and crabs.

**Family: Testudinidae**

***Geochelone elegans* (Schoepff, 1795) (Plate 8.1 E):** This species is found in dry and arid zones of Eastern Ghats, south of river Mahanadi. It is reported from Ganjam district and in the hills of Parelakhemundi and Gajapati. This species is found in the *Casuarina* and Cashew plantation along the coast, in scrub forest and dry deciduous forest. In captivity, breeding females were reported of more than 210 mm carapace length and breeding activity was from October to January (Biswas and Acharjyo, 1984; Smith, 1931). Four to six eggs were laid, slightly oval in shape, measuring 37 X 41mm to 21.3 X 24.5mm. The incubation period is 122 days (Dutta: *pers. obs.*)

***Indotestudo elongata* (Blyth, 1853) (Plate 8.1 F):** This forest dwelling species mostly found in Sal dominated moist deciduous and semi-ever-green forests with big rock boulders. It was reported from throughout Similipal Biosphere Reserve of Mayurbhanj and Keonjhar districts; Kuldiha of Balasore district; Hadgarh of Keonjhar district, Kapilas hill ranges of Dhenkanal district and Baialishmauja of Cuttack district (Dutta *et al.*, 2009).

**Family: Trionychidae**

***Nilssonina gangetica* (Cuvier, 1825) (Plate 8.1 G and H):** This species is found in most of the rivers and reservoirs in Orissa, specifically in the Mahanadi, Ramiala, Tel, Brahmani, Baitarani, Budhabalanga, Devi, Chitrotpala rivers; Chilka lake, Hirakud, Indravati and Balimela reservoirs. Nesting takes place during winter and hatchlings were seen during monsoon period. This species nests in the sandy bank and also in sandy loam soils near ponds and other water-bodies. A clutch of 30-85 round eggs are laid by digging a deep pit. This species is worshiped in many of the temple ponds in Orissa. It is omnivorous in feeding habit and individuals were seen feeding on cattle or even human carcasses near the river banks. It is mostly exploited for meat and medicinal value of the calipee.

***Nilssonina hurum* (Gray, 1831) (Plate 8.1 I and 8.2 A):** This species is found in Mahanadi river, specifically at Satkosia gorge, Kantilo and Naraj area having deep water and also reported from Nemala area of Chitrotpala river and up streams of Brahmani, Baitarani and Dhamra rivers near Bhitarkanika wildlife sanctuary. The juveniles of the species are worshiped due to the prominent eye-spots resembling the eyes of Lord Jagannath.

***Nilssonina leithii* (Gray, 1872):** This species is mostly confined to Southern Orissa. Biswas and Acharjyo (1984) mentioned that two females were collected from Balimela reservoir in Sileru river at Chitrakonda in Koraput district (now Malkanagiri). However, our surveys in Mahanadi river did not yield any sightings.

***Pelochelys cantorii* Gray, 1864:** The earlier records of *Pelochelys bibroni* (Owen, 1853) from Orissa by Vijaya, 1982; Das (1987) and Chadha and Kar (1999) are now referred as *P. cantorii* Gray, 1864 (Webb, 1997; Das, 2008). This species is known from estuaries and sea coasts in Orissa. Das (1987) mentioned about distribution of the species in Brahmani-Baitarani delta at Bhitarkanika wildlife sanctuary, where it is reported to be nesting. Chadha and Kar (1999) reported this species in Patasala area of Brahmani, Baitarani, Dhamra and Kharasrota rivers. Unconfirmed reports are from Chitrotpala and Luna rivers in Kendrapara district (fishermen reports). Although it is considered rare in many parts of Indian subcontinent, this species is not uncommon in Bhitarkanika (Chadha and Kar, 1999).

***Chitra indica* (Gray, 1831) (Plate 8.2 B):** A purely freshwater species living in deep water gorges and can reach up to 70 kg body weight. The dorsum carries a striking pattern of deep yellow and black closely resembling the colour pattern of tiger, as a result of which many locals describe it as "tiger turtle". This study reports the species from Mahanadi river at Satkosia gorge, Kantilo, Kandarpur, Munduli area having water depth of more than 40 feet. Several specimens were caught by fishermen and released. It is highly aggressive in disposition



and prefers steep river banks for basking. A clutch of 25-60 eggs are laid during winter months near the sandy bank. Eggs are sometimes predated by people, dogs and jackals.

***Lissemys punctata* (Lacepede, 1788) (Plate 8.2 C and D):** One of the most common fresh water turtle species in the state. This species is known to live in rivers, ponds, low-land agricultural fields and swampy areas. It occurs throughout the rivers and ponds in Orissa. Annandale (1907) reported the subspecies *Lissemys punctata granosa* [synonymised as *L. punctata punctata* (see Fritz and Havens, 2007)] from Chilka lake, which has also been recorded from many parts of south Orissa (Sanyal, 1993). This species is widely poached for the fresh water turtle trade in Orissa and regular consignments are sent out from the coastal areas of Pipli, Rahama, Jajpur, Niali, Paradip and Jagatsinghpur to West Bengal.

#### Conservation of Fresh water turtles in Orissa

Though turtles are worshiped as incarnation of Lord Vishnu in Hindu culture, still they face threats due to habitat destruction and a steadily growing market for turtle meat, eggs and pet trade. Out of the 17 species of turtles found in Orissa, all the four species of marine turtles and seven species of freshwater turtles are listed under Schedule-I of Wildlife (Protection) Act, 1972. Four species are listed under Schedule-IV and two species are not listed. Threats to individual species and the legal protection status are summarized in Table-1.

#### Community conservation efforts

Many of the large fresh water turtle species are protected by the cultural and religious systems of the local community belief. *Nilssonina gangetica* is protected by the local community in Champeswar Temple near Baramba and in Maneswar temple of Sambalpur (*Surakshya se Samrakshyan*, Vasundhara, 2007). In Parelakhemundi many temples also serve as rescue centres for species like *Geochelone elegans*. When people find turtles in their agricultural fields during forest fires, they bring them to the temples and later release them into the wild after a few months. In some of the areas along the Mahanadi river and its distributaries from the stretch from Gania to Paradeep, where there were reports of rampant poaching and trade, the local communities are now protecting the turtles after the initiative taken by the Wildlife Society of Orissa, a non Government Organization based at Cuttack.

#### Suggested conservation measures

1. A detail inventory of fresh water turtles inhabiting the river systems of Orissa and their current status is in urgent need to address the conservation measures of the group.
2. Developmental activities and destruction of turtle nesting sites due to rampant sand mines should be stopped or regulated to give protection to the species.
3. Study should be carried out to examine the possible threats to the turtle species due to habitat loss, forest fire and poaching.
4. Steps to be taken to stamp out the ongoing fresh water turtle trade.
5. Creating awareness programmes in villages and schools to curb illegal trade of turtles and their parts will be helpful.
6. Community conservation efforts should be properly recognized, loss of fishing nets should be compensated and management guidelines can be developed for better management of the turtles.

**Research Gap:** Random surveys carried out in the various turtle habitats (except that of Mahanadi river system) were not done throughout the year. We could not cover the Mahandi river system completely; important tributaries flowing in the state of Chattisgarh were omitted from the survey due to limited funding support. Major tributaries like Ong, Ib and Tel in Orissa were not covered. Distributaries like Bhargavi, Birupa, Genguti, Nuanai, Kuakhai and Kushabadra were not surveyed.

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**Table-1: Annotated checklist of fresh water turtles and tortoises of Orissa with their protection status and threats to individual species**

S.No	Scientific name	Vernacular name	Legal protection	IUCN	CITIES	Threats
1	<i>Batagur baska</i>	Hadua nadi kaincha/ Ram Kachim	Schedule I	Critically Endangered	Appendix I	Fishing activities, trapping for the trade
2	<i>Pangshura tecta</i>	Nali-baka katha kaincha	Schedule-I	Lower Risk/least concern	Appendix-I	Incidental by-catch in fishing; eggs are predated by jackals, dogs and human; habitat destruction due to sand mining
3	<i>Pangshura tentoria</i>	Katha kaincha	Not listed	Lower Risk/least concern	Appendix-II	Incidental by-catch in fishing; eggs are predated by jackals, dogs and human; habitat destruction due to sand mining
4	<i>Melanochelys trijuga</i>	Kala pahadi kaincha	Not listed	Lower Risk/near threatened	Not listed	Forest fire; live pet trade for medicinal value of meat and shell, use of shells for violin like musical instrument.
5	<i>Melanochelys tricarinata</i>	Tini-garia pahadi kaincha	Schedule-I	Vulnerable	Appendix-I	Forest fire, habitat destruction.
6	<i>Geochelone elegans</i>	Star kaincha	Schedule IV	Lower Risk/least concern	Appendix II	Strong demand for pet trade, being exported in large numbers, trading of shells for decoration.
7	<i>Indotestudo elongata</i>	Pathuria kaincha	Schedule-IV	Endangered	Appendix II	Pet trade, local food, use of shells for violin like musical instrument
8	<i>Nilssonina gangetica</i>	Balera kaincha	Schedule-I	Vulnerable	Appendix I	Local consumption of meat; inter-state trading for meat; large scale trading of calipee for medicinal purpose; poaching of eggs; habitat destruction due to sand mining.
9	<i>Nilssonina hurum</i>	Chata kaincha	Schedule-I	Vulnerable	Appendix I	Local consumption of meat; inter-state trading for meat; large scale trading of calipee for medicinal purpose; poaching of eggs; habitat destruction due to sand mines.
10	<i>Nilssonina leithii</i>	Not available	Schedule IV	Vulnerable	Appendix II	Probably killed for meat and for medicinal value of calipee.
11	<i>Pelochelys cantorii</i>	Not available	Schedule-I	Vulnerable	Appendix II	Fishing activities
12	<i>Chitra indica</i>	Chitra kaincha, Tiger kaincha	Schedule-IV	Endangered	Appendix II	Local consumption of meat; inter-state trading for meat; poaching of eggs; habitat destruction due to sand mining.
13	<i>Lissemys punctata</i>	Pankua kaincha, Thali kaincha	Schedule-I	Lower Risk/least concern	Appendix II	Local consumption and inter-state trading for meat.



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Plate 8.1



(A)



(B)



(C)



(D)



(E)



(F)



(G)



(H)



(I)

(A): *Pangshura tectum*; (B): *Pangshura tentoria*; (C): *Melanochelys trijuga indopeninsularis*; (D): *Melanochelys tricarinata*; (E): *Geochelone elegans*; (F): *Indotestudo elongata*; (G): *Nilssonia gangetica* (Juvenile); (H): *Nilssonia gangetica* (Adult) and (I) *Nilssonia hurum* (Adult)

Plate 8.2



(A)



(B)



(C)



(D)



(E)

(A): *Nilssonina hurum* (Juvenile); (B): *Chitra indica*; (C): *Lissemys punctata*; (D): *Lissemys punctata* (Albino) and (E): River system of Orissa showing major river basins (Source: <http://www.dowrorissa.gov.in/SWFs/RiverSystem.htm>)