

An Evaluation of Distribution, Status and Abundance of Freshwater Turtles in Uttar Pradesh

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Introduction

The state of Uttar Pradesh (UP) in north India, lies between 77°5' -84 °38'E and 23.0 ° 52' -30 ° 24' N covering a geographical area of 240927 square kilometer or 7.33 percent of land area of the country and divided into seventy one districts (TERI 2003). The state comprised four major ecological zones namely *Terai* (foothills of Himalaya), Gangetic Plain, *Vindhyan* and Semi-arid region.

Fifteen of the twenty-nine species of fresh water turtles and tortoises found in the subcontinent occur in the state of Uttar Pradesh but virtually no base line information exists on the species wise occurrence or abundance – qualitative or quantitative - in specific habitats. Notable exceptions are the efforts of Basu 1993 (Gomti River) and 1996 (Yamuna River); Javed and Hanfee 1995 (Dudhwa National Park) and Rao 1998 (Upper Ganges River). Even if these contributions of the above workers are considered together they scarcely makes good the deficiency in information, which precludes objective evaluation of status monitoring and planning and prioritization of conservation of turtles in the state. This remains daunting task for a state with over 11,000 known wetlands. In September 2004, we initiated systematic surveys in order to assess distribution and status of turtles in the rivers and wetlands of the state. The objective of these surveys was to compile an inventory of turtle habitats in the state to enable prioritization for future detailed collection of base line information on species occurrence and abundance and facilitate the planning of high priority habitats to initiate conservation actions. Here we present observations on distribution and abundance of turtle species surveys in over 100 wetlands from 20 districts of the state and prioritize their importance as turtle habitats as assessed from 2004 through 2008.

Methods

Our work was divided into two phases. In Phase I, identified habitats were surveyed continually from September 2004 through December 2005. In Phase II, from January 2006 through December 2008, surveys were conducted more opportunistically and simultaneously along with the "Egg Protection Program for Endangered Turtles in National Chambal Sanctuary of Uttar Pradesh and Madhya Pradesh". While the number of days devoted to the surveys each year is presented as Plate 9 A.

Surveys

We visited wetlands (lentic and lotic) that reportedly were potential turtle habitats, about which information had been received through interviews and enquiries or during the surveys of other wetlands. We designed and used a 17 point "Habitat Data Sheet" (Appendix 1) to collect relevant information on the attributes of the wetland as turtle habitat and photographed the habitats. A colored turtle identification guide by Hanfee (1999) was used while interviewing local residents, fishermen and occasionally (ex-) turtle poachers of the habitat area about the occurrence and abundance of various turtle species.

Habitats were sampled for turtles by manual capture, deploying specialized turtle gears mainly hoop-traps and various traditional fishing gears especially nylon gillnets or any other gear used locally for catching turtles. Deployed traps were checked at regular intervals to avoid any accidental drowning of turtles. Incidental



catches of turtles in fishing gear of local fishermen were also examined and these together totaled nine different methods of sampling. Data on all turtles captured during sampling or dead turtles or other turtle material (primarily shells) found and examined during the surveys was recorded on a separate turtle sampling data sheet. Turtle specialized gears were minimally used in order to not to reveal local turtle trappers about new trapping techniques. The gears used during the sampling at different habitats were as follows:

A: Exclusive Methods used for sampling of turtles: 1.Hoop trap 2.Iron probe 3.Seine net 4. Drift Net 5. Manual capture

B: Types of fishing gears whose incidental captures were examined: 1.Basket trap 2.Drag net 3.Hook 4.Throw net

Sixty nine of the 101 surveyed habitats were sampled on 123 different occasions for occurrence of turtles. But turtles were captured only from 60 habitats. Turtles caught were measured, weighed, sexed on the basis of external dimorphism and selectively photographed before being released at the precise location of capture. Binoculars were used to spot turtles during visits to the habitats. Turtles were observed basking on riverbanks only during boat and foot surveys. Turtles were not accounted for when observed swimming on the surface of habitats covered with aquatic vegetation.

Prioritization of Habitats

The wetlands/habitats visited, were assigned an ascending score of 1 to 10 for each favorable criterion and a composite score calculated for the habitat to assign it a priority rank on the basis of the composite score. The habitats were then prioritized by using a matrix, which takes into consideration the following six evaluation criteria:

Habitat Extent

A score was assigned according to the extent/size of the wetland. <1 Hectare -1; 1-5 Ha -2; 5-10 Ha -3; 10-25 Ha -4; 25-50 Ha -5; 50-100 Ha -6; 100 - 250 Ha -7; 250 -500 Ha -8; 500 -1000 -9; >1000 -10; All small rivers and streams -5; All medium and larger rivers -7

Human Impact and Anthropogenic Factors

Activities such as fishing, sand removal, construction, siltation have severe impacts on turtle populations and nesting. (Choudhury1995). Factors like Sewage/Industrial discharge influx, Water abstraction, Water level manipulation, Fishing gear interference/mortality, other anthropogenic disturbance; distance form nearest human habitation were taken into consideration to score for this section.

Habitat Suitability

The freshwater turtles- both Batagurid (hard-shell) and Trynochid (soft-shell) need special critical habitats in aquatic as well as aquatic-terrestrial transition zone (Daniel 1983) to perform various biological activities like basking, nesting, foraging and thermoregulation. So perennality, contiguity with river or lotic habitats, maximum depth, shoreline suitability for basking and nesting, availability of forage/food, absence of predation pressure/ direct hunting of turtles, Absence of eutrophication (weed infestation) were the factors considered for rating habitat suitability.

Species Diversity

The available score (10) was divided by the number of freshwater species occurring in the state (14). The resulting score was timed with the number of species suspected or known to be extant in habitat, rounded to the nearest whole number for determination of score.

Total Population Abundance

Unknown/known Low Abundance-1, Confirmed High Abundance-10

Absent -1; Near absent -2; Unconfirmed low abundance -3; Confirmed low abundance -4; Unconfirmed Moderate abundance -5; Confirmed Moderate abundance -6; Unconfirmed high abundance -7,8; [if one or more species are believed to be abundant in the habitat] Confirmed high abundance -9, 10; [if one or more species are known to be abundant in the habitat]

Rating of High Priority Species

The habitats were rated according to the number of species of high conservation priority occurring in the habitat, in the following order of listing: *Batagur* (earlier known as *Kachuga*) *kachuga*, *B. dhongoka*, *Chitra indica*, *Hardella thurjii*, *Nilssonina hurum*, *N. gangetica*, *Geoclemys hamiltonii*.

Results

A total 61 wetlands from 9 districts and 40 wetlands from 11 districts were surveyed in phase I and II respectively. A map of the state of Uttar Pradesh depicting the surveyed districts is presented below as Plate 9 E. 101 wetlands in 20 districts (Pilibheet, Kheri, Bahraich, Shravasti, Hardoi, Lucknow, Barabanki, Sultanpur, Unnao, (Phase I) Gonda, Balrampur, Gorakhpur, Etawah, Sitapur, Agra, Aligarh, Faizabad, Bulandshahr, Farukhbad, Allahabad (Phase II), of the state were visited, which included the survey of a continuous section of the Gomti River spanning c. 250 km in four districts namely Hardoi, Lucknow, Barabanki and Sultanpur. An important section of the Ganges River (Avantika Devi to Ramghat) on the border between districts Bulandshahr and Badaun and in Farrukhabad district and adjacent wetlands were also surveyed in fair detail. Furthermore, entire length of Chambal (Etawah and Agra districts), Yamuna (Agra and Etawah districts), Sarju (Gonda and Bahraich Districts) and Ghaghra (Bahraich and Barabanki districts) river were repeatedly surveyed and sampled on different occasions. The habitats visited were categorized into 9 types, which are stated as follows, with the number in square parentheses indicating the number of habitats of each type visited.

A) Small river [5] B) Large river stretches [4] C) River-pool [7] D) Stream (Hindi- nullah) [6] E) Marshy-wetland [10] F) Ox-bow lake [4] G) Pond <1 Ha [38] H) Lake >1Ha [23] I) Dammed reservoir [4]. Forty percent of the ponds were always covered with dense floating or emergent aquatic vegetation and turtle sightings were insignificant and negligible at such habitats.

During the course of these visits 618 turtles belonging to 14 species (4 Trionychids and 10 Batagurids) were either captured or obtained from fishing/ turtle traps deployed by fishermen and turtle poachers and examined from 60 different sites enabling confirmation of their occurrence in the particular habitats (Plate 9C). The species that were captured/ encountered and examined during surveys were *Batagur kachuga* (9), *Batagur dhongoka* (24), *Chitra indica* (9), *Lissemys punctata andersoni* (69), *Melanochelys trijuga indopeninsularis* (7), *Melanochelys tricarinata* (4), *Pangshura tecta* (79), *P. tentoria circumdata* (112), *Pangshura smithii* (89) *Geoclemys hamiltonii* (18), *Nilssonina gangetica* (36), *Nilssonina hurum* (7), *Hardella thurjii* (143) and *Morenia petersi* (12). The result from is presented as proportion of species in entire samples with the location of occurrence in Plate 9B.

Apart from the samples of turtles documented above, we also recorded quantified data of turtles basking and swimming, which were most frequent in the Chambal River in Agra and Etawah, Ganga River in District Bulandshahr and Farrukhabad and in the Gomti River in the districts Barabanki and Sultanpur. In addition, eight ponds protected traditionally or for religious reasons were also documented. These ponds harbor considerable numbers of a few soft-shell turtle species especially *N. gangetica* and *L. punctata andersonii*. In the Gomti River the observed density of *P. tentoria circumdata* was considerable and probably comparable to those seen by other workers in the Yamuna River of the state in 1996. Out of the total habitats visited 10 habitats, listed in Table-1, of present communication, were rated as most important on the basis of the criteria mentioned and further described for each habitat in the table. These ten habitats have been selected for further intensive observations, investigations (including sampling), and conservation research and species recovery programs.



Table-1: Few Prioritized Turtle Habitats for Conservation Action Planning and Implementation.

Order of priority of habitat	Name of habitat	Criterion
1	Chambal River in Etawah and Agra (ca. 175 km)	This habitat supports fairly good populations of few endangered chelonians viz. <i>Batagur</i> , <i>Chitra</i> and <i>Hardella</i> species. Relatively undisturbed and protected habitat offers various micro-habitat complexes to different turtle species and serves as repository for breeding populations of most critically endangered turtle species of the state i.e. <i>Batagur kachuga</i> .
2	Sarju River near Colonelganj in Gonda (ca. 120 km)	The diverse habitat conditions (swampy/marshy as well as relatively clear slow flowing patches), which harbor several species of turtles <i>Hardella</i> , <i>Chitra</i> , <i>Geochelamys</i> , <i>Morenia</i> , <i>Nilssonina</i> , <i>Lissemys</i> etc. Few large breeding populations of <i>Hardella</i> located on different pools of the river recently (S. Singh, unpublished data). Some of the stretches are under socio-religious protection.
3	Gaghra river down Ghaghrahat and Bahraich (ca. 50 km)	Support fairly good population of <i>Chita indica</i> , <i>B dhongoka</i> and <i>Pangshura smithii</i> . Species like <i>Geochelamys hamiltonii</i> , <i>Hardella thurjii</i> and <i>Nilssonina species</i> also found in back water of the river. Although the habitat is unprotected but relatively sustaining anthropogenic pressures due to its fast flow and vast flood land (mostly unfit of human habitations)
4	Mala and Khannuat Rivers in Pilibheet (ca. 10 km and 15 km respectively)	Three streams lying within a dense reserve forest that is fairly well protected. During week long surveys in 2005, 11 turtles belonging to 6 species were captured and examined. Notables are <i>Morenia</i> and <i>Melanochelys</i> . The overall density and diversity of chelonians in the area appeared to merit further study to characterize their present status, as the turtle assemblage occurring in this habitat merit concerted conservation efforts.
5	Kakrakhara village pond, Hardoi (2 hectares)	A community protected small pond, but support high density of <i>N. gangetica</i> and <i>N. hurum</i> . The turtles receive comprehensive protection from villagers and represent a role-model of positive human-turtle wildlife relation.
6	Goolar taal, Pilibhit ((ca. 40 hectares)	A very good habitat, where population of the six species of the turtles (<i>G. hamiltonii</i> , <i>H. thurjii</i> , <i>M. petersi</i> , <i>M. tricarinata</i> , <i>L. p. andersonii</i> , <i>N. gangetica</i>) could be reported and secured in view of the undisturbed and biotic-pressure free nature of the habitat.
7	Darangha and Raja Nal Ka Taal river pools on Gomti River, Sitapur/Hardoi (ca. 40 km)	Though under immense fishing pressure and water pollution, the river offers suitable habitat for certain species of turtles favoring slow flowing habitats. There are considerable stretches that are not disturbed by anthropogenic factors where good basking and nesting sites were observed. A fairly dense assemblage of <i>P. tecta</i> and <i>P.t. circumdata</i> was captured during the mark-recapture studies by Basu (1993) and Singh (2003) respectively. The habitat supports eight more turtle species besides fairly abundant <i>Pangshura</i> .
8	Ranganga confluence, Ganga River, Farhukabad (ca. 10 km)	This river stretch recently finds a place in the top ten turtle habitats in the state after a confirmation that it serves as a communal nesting site for <i>Chitra indica</i> , an endangered soft-shell turtle species. The habitat is under biotic pressure and water pollution but the other favorable habitat attributes, considerable diversity and density of other soft shell and hard shell turtle species make it one of the possible turtle conservation reserves where threatened turtle populations can be restored in future.
9	Yamuna River (Bateshwar to Pachnada) Agra and Etawah (ca. 80 km)	Due to religious protection to the few stretches this habitat support a good density of <i>Pangshura</i> and <i>Nilssonina</i> . In addition further this stretch is strategically important for the conservation management of Chambal River in National Chambal Sanctuary. Larger river turtle species like <i>Batagur kachuga</i> , <i>B dhongoka</i> , <i>Hardella</i> , <i>Chitra indica</i> seasonally migrate into this stretch from the protected Chambal especially during monsoon season.
10	Sharda sagar dam reservoir, Pilibhit (Over 200 hectares)	The Sharda Sagar reservoir provides extensive habitat for chelonians especially those that inhabit lentic habitats. The water of the reservoir is unpolluted. A detailed study on the ecology of turtles in such dams is required.

Discussions

Only two periods of all survey years totaling about five months per year were found, optimal for survey and sampling during the tenure of our work. The first was from early October to mid-November [end of monsoon to onset of winter] and the next from early-mid March to mid July [end of winter to onset of monsoons]. Other than these periods, habitats were either flooded or ambient temperatures were too low, as a result most species of turtles were not active enough to be observed or sampled. Nesting of few species recorded during the August (C.

indica and *N. gangetica*), November (*P. tentoria circumdata*), February and March (*B. dhongoka* and *B. kachuga* respectively), which was helpful as a direct indicator of presence of certain species in a few of the habitats.

The results of the surveys along with findings of the turtle sampling exercises and reconsideration of existing information indicate that turtle populations in the state of UP, have declined considerably and habitats have been degraded. This decline is very pronounced in the case of large Batagurids, as surviving populations of *B. kachuga*, *B. dhongoka* and *H. thurjii* were reported or captured from a few tributaries of Ganga River. The breeding population of *B. kachuga* can be confirmed only from the Chambal. In addition, few specimens were found in lesser Yamuna river (close to Yamuna- Chambal confluence) in August 2007, individuals were probably seasonal migrants from the Chambal River during the monsoon season. No specimen of *B. kachuga* was captured during extensive surveys in the upper Ganga close to Narora Dam in 2005 and 2006. Continued occurrence of *B. dhongoka* could be confirmed from Ganga, Ghaghara, Chambal, Yamuna Rivers and few other oxbow lakes in vicinity of Ganga and Ghaghra but were recorded to have disappeared from several pools of the Gomti (Singh and Basu 2003; unpublished data); where it was found just a decade before (Basu, 1993).

Soft-shells like *N. gangetica*, *N. hurum* and *C. indica* are being targeted and extensively hunted for their meat and calipee (outer cartilaginous rim) throughout the areas covered during the surveys (TCM). The rim is exported illegally to South-east Asia where it is used in the Traditional Chinese Medicine as aphrodisiacs. One kilogram dried calipee fetches about ' 2000 (\$ 50) to the turtle trappers in Terai (Singh 2008, unpublished data). Turtle trade is being operated by organized gangs mostly based in Central parts of the state like Kanpur, Sultanpur, etc.

Javed and Hanfee (1995) reported *B. dhongoka* from lentic wetlands of protected areas such as Dudhwa National Park, but they have remarked that these wetlands may represent marginal habitats for the species. *Hardella* was reported by them as common in these habitats (Plate 9D) and there is no reason to believe that the situation has altered very much. Not much additional information on the status of single tortoise species *Indotestudo elongata* of state could be gleaned in the course of the surveys conducted except a specimen found by forest department staff from the Sohelwa Wildlife Division in Balrampur in 2007 (Sanjay Pathak, pers. comm).

Species such as *Lissemys* and *Pangshura* species were ubiquitous and hold their own even in marginal habitats and in the face of considerable hunting pressure for food and pet trade respectively.

The average encounter rates for *P. tentoria circumdata* in the Gomti was 8.85 km^{-1} (+ 6.33; 1.14 – 26.0) [compared with 18.58 km^{-1} (+ 12.67; 3.8-34.8) in Lesser Yamuna (above its confluence with Chambal River)] (UPFD 1996). *P. smithii* was observed in high densities in the Ganges River in districts Bulandshahr/Badayun in western UP and *P. tecta* in the Khurdiva wetland (a backwater) in district Shravasti, a situation which is likely to be consistent through many smaller streams that occur in the extensive Ganges River System flowing through the state. Likewise among the Trionychidae, *L. punctata andersonii* is believed to be comparably abundant, as it was located or reported from almost all the habitats visited so far. The reasons for the survival success of these species may be a) in the case of *Pangshura* – these are herbivorous turtles with abundant food resources available in their habitats and because of their small size they do not suffer high mortalities in fishing nets like the larger Batagurids such as Batagur and *Hardella*. b) *Lissemys* because of its ability to aestivate by burrowing into pond and lake bed mud, is able to inhabit numerous marginal habitats that are ubiquitous throughout the state. Even though they are actively hunted by the *Kuchbadhia* (a semi-nomadic tribe of Northern India) communities and other turtle trappers for illegal export to the South-east Asia through eastern parts of the country and make up the bulk of the considerable clandestine trade in turtles, the volume of trade seems to be clearly sustainable compared to the availability of resources.



The surveys unearthed new informations in confirming the occurrence of *Morenia petersi* in the district of Pilibhit. This is a notable locality record for this species, more than a 100 km north-west of Dudhwa National Park in district Kheri where it was last recorded by Javed and Hanfee in 1995. One specimen of the species was also found in Ganga close to Kanpur town in November 2008 (S Singh unpublished data), which is the southern most locality record in the Ganges for the species which is most expectedly a *Terai* dwelling species.

Research and Conservation Management Requirements

The surveys should be continued to sample as intensely as possible all potential turtle habitat in remaining districts of the states to documenting all pockets where turtles do survive in any great diversity and/or abundance. Also systematic assessment of habitat suitability and viability should be routinely done to identify habitats where conservation based on ex-situ measures and supplementation/reintroduction may be taken up.

A recovery program is immediately warranted for endangered turtle species like *B. kachuga*, *B. dhongoka* and *C. Indica*. Turtle surveys must be initiated to understand the demand on different turtle species, the trade route and the quantities involved in the trade.

The three batagurid species *Morenia petersi*, *Melanochelys tricarinata* and *M. trijuga* indopeninsularis, which were formerly believed to occur only in the east regions of the country, was discovered in this state only within the last two decades. The distributions of these three species have not been studied but they are believed to be restricted to the moist *Terai* region that adjoins the Himalayas. However the limits of the *Terai* ecological region especially with respect to its chelonian and other herpetological fauna are similarly unknown. It is therefore necessary to collect detailed hard base line data about the faunal limits of the *Terai* region to enable future reassessment of species distribution limits as these may change over time.

There are also a number of species such as *G. hamitoni* and *H. thrujii* found in lentic and slow flowing lotic water-bodies that are data deficient, whose present day distributions can only be conjectured. As these are large batagurid turtles that are in high demand as edible species and susceptible to high mortality in fishing nets, these is urgent need to assess their present day distribution and conservation status as well

Breeding pools of all species need to be established in captivity to develop assurance stocks of turtles at Kukrail Gharial (& Turtle) Rehabilitation Center near Lucknow, Sarnath Turtle Rehabilitation Center near Varansi, Garhaita Turtle Conservation Center near Etawah and also in the Kanpur and Lucknow zoos especially for endangered species like *Batagur kachuga* and *Chitra indica* on priority basis.

Socio-economic studies should be initiated in and around all the potential turtle habitats to understand the impact of anthropogenic pressures and relationships. Sustained public awareness programs aimed at curbing hunting of turtles especially in habitats inhabited by endangered and threatened species need to be initiated early.

Acknowledgements

We extend our sincere thanks to Turtle Survival Alliance, Turtle Conservation Fund and Cleveland Metro-park Zoo and Cleveland Zoological Society to support various surveys through different grants from 2004 to 2008. Rick Hudson and Brain D. Horne are thanked for their guidance and project suggestions. Romulus Whitaker is thanked for his suggestions inputs. Trustees and staff – especially Dr. Gowri Mallapur-of Madras Crocodile Bank is acknowledged for various logistical and administrative supports. Harry V. Andrews, Shashwat Sirsi, Bhasker M. Dixit, Pradeep K. Saxena, Nikhil Whitaker, Khem B. Bhadauria are acknowledged for their support in organizing or conducting surveys and consultations. Uttar Pradesh Forest Department officials- especially

B.K. Patnaik, D.N.S. Suman, Mohd. Ahsan, Neeraj Kumar, Eva Sharma and Suresh Pal Singh- are highly acknowledged for various permissions and logistic supports. Field Assistants Bikash, Thakuri, Santram, Radheyshyam are acknowledged for their assistance along their respective sites.

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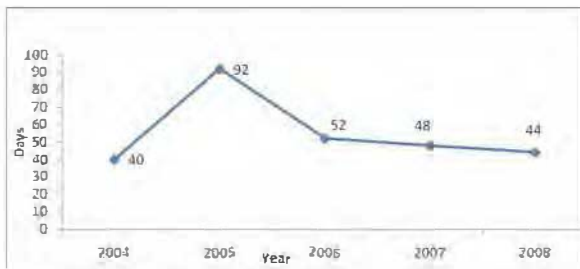
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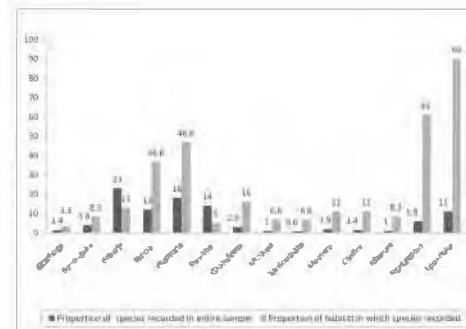
Annexure-1: Sample "HABITAT DATA SHEET".

1	Name of Water-Body	Sidhbaba, Mala River, Pilibhit
2	Date of visit	23.01.05 and again from 09.003.05 to 12.03.05
3	Approach route	Lucknow-Pilibhit-Richhola
4	Mode of travel	Lucknow-Pilibhit: train; Pilibhit (Gouhania square)- Richhola: bus; Richhola to Sidhbaba 3km bicycle or any other local transport. The site is easily accessible from road as the road to Madho Tanda from Pilibheet passes by this habitat.
5	Distance of water body from nearest human habitation	About 10 km from Kalinagar.
6	GPS reading of water body	28°37'58.7"N 79°58'30.5"E
7	Size of water-body	2 Ha
	Description of Weather conditions	Ta: 15°C; RH: max:77%; rainfall was observed since the early hours of that day, at time of observation- partly sunny, humid, beaufort scale 1 Tw: 13°C; min: 79%
8	Type of water body and legal status	This is a lotic pool of the Mala River - (which passes through the <i>Shorea robusta</i> forests of the Mala Range of North Pilibhit Forest Division. At Sidhbaba the depth of the river is ca. 20 feet. In the other sections of its course the stream may be shallow and braided passing over swampy areas.
9	Shoreline type	Gentle
10	Description of shoreline vegetation	Jamun (<i>Syzigium cumini</i>), bilsa, grasses comprise the shoreline vegetation. In many parts the banks are bordered by thick cover of <i>Phragmites</i> .
11	Description of aquatic vegetation	Diverse species of lily, <i>Phragmites</i> spp., <i>Chara</i> , <i>Potamogeton</i> , <i>Chlorella</i> , <i>Volvox</i> , <i>Nymphia</i> , <i>Vallisneria</i> , Algal species etc.
12	Level of human impact	Moderate- The Mala River is auctioned for fishing by the Forest Department and the contractor engages various fishing parties (mostly ex-patriate Belgali community members) to fish in different sections of the contracted stretch of river. Fishermen use fixed fish traps that barricade entire river. However the number of fishermen who fish in the area is strictly regulated by the contract system.
13	Occurrence of turtle hunting	Turtle hunting is done by resident Bengalis mostly for consumption. Previously turtles used to be openly sold in local markets for local consumption but in more recent times turtles are consumed clandestinely by fishermen who directly participate in fishing. Turtles are incidentally caught in fish traps that are used on the Mala river but several fishermen possessed three pronged iron probes for hunting turtles.
14	Sighting and occurrence of turtles	No turtles seen or caught on first visit- Sampling were carried out by two field assistants who used three pronged iron probes to look for turtles under the silt or amidst <i>Phragmites</i> grasses. On the 25 th of Jan a female <i>Melanochelys tricarinata</i> was captured by hand in Dhamela compartment of Mala range, it was measured and photographed and released at the point of capture. The dimensions, cloacal temperature of the turtle were measured- During the second visit from 08 to 130305 the following turtles were captured. <i>M. trijuga</i> -2, <i>P. tecta</i> -5, <i>G. hamiltonii</i> -1, <i>M. tricarinata</i> -1, <i>L. p. andersonii</i> -1. Details of all specimens examined are included in turtle data sheets attached.
15	Assessment of potential as turtle habitat	This is a habitat lying within a reserve forest, which has dense forests that are fairly well protected. In spite of some regulated fishing and some clandestine hunting and consumption of turtles still the populations seem secure.
16	Contact persons	DFO N. Pilibhit Sri Neeraj Kumar; R.O.Mala range- M.P singh
17	Future Study requirements and Action	Detailed studies are warranted to precisely determine the baseline status of the 5 confirmed and 3 other reported species. There is also need to enhance awareness and sensitize local Bengali fishing communities about turtle conservation.

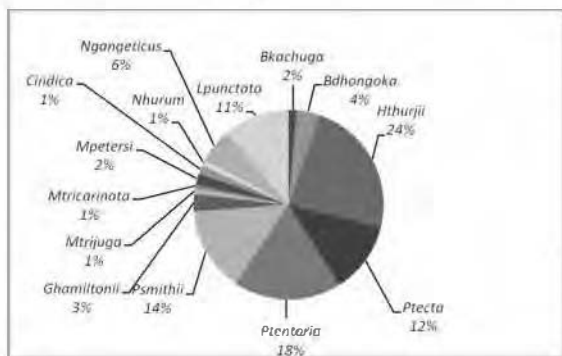
Plate 9



(A)



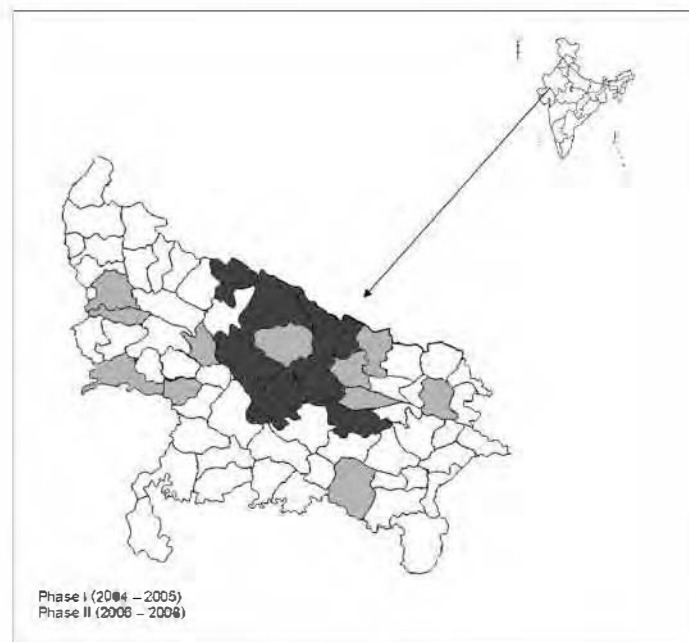
(B)



(C)



(D)



(E)

(A): Survey days during the study period; (B): Proportion of turtle species sampled Vs locations of Occurrence; (C): Species wise (round off) proportion of the different turtle species in entire sample; (D): A Group of *Hardella* foraging on the Sarju River and (E): Map of Uttar Pradesh showing the districts covered in Freshwater Turtle Surveys