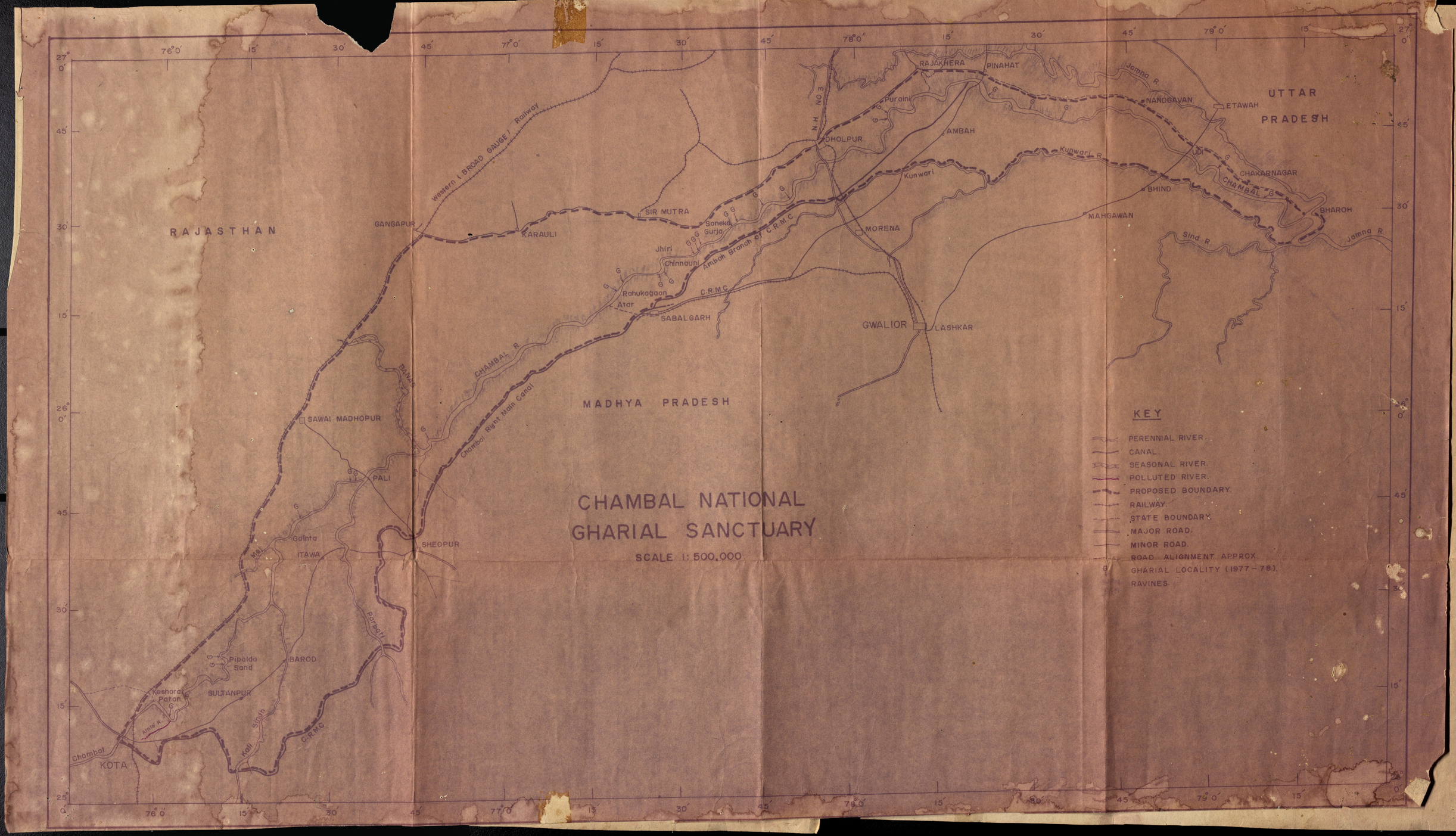
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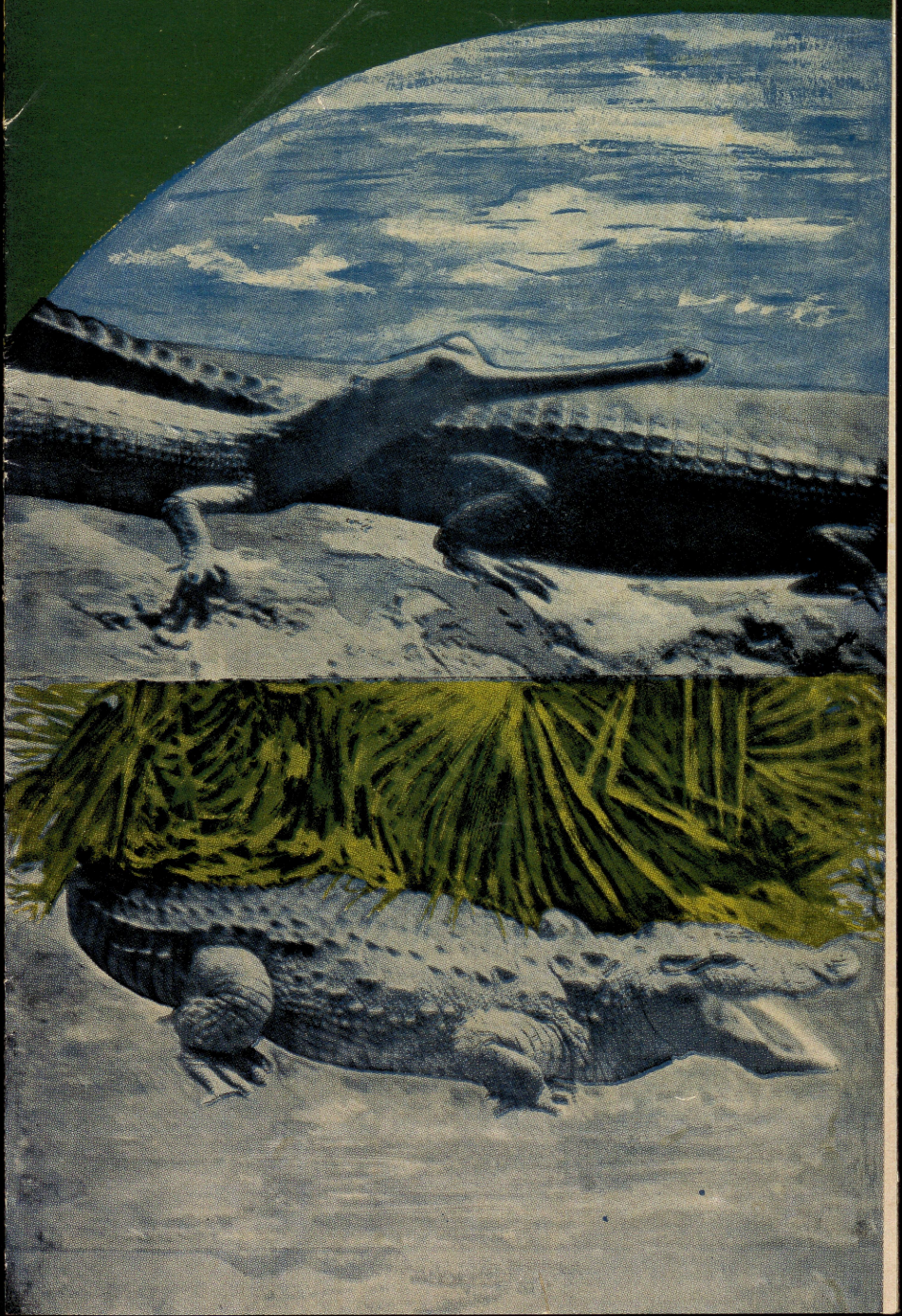
CANAL.
SEASONAL RIVER.
POLLUTED RIVER.
PROPOSED BOUNDARY.
RAILWAY.
STATE BOUNDARY.
MAJOR ROAD.
MINOR ROAD.
ROAD ALIGNMENT APPROX.
GHARIAL LOCALITY (1977-78).
RAVINES.

Crocodile

REHABILITATION IN U.P.



CROCODILE REHABILITATION IN UTTAR PRADESH

Reptiles were the first vertebrate on the land. From the early reptiles evolved the massive dinosaurs which dominated life on land, air and water. They became extinct millions of years ago. Crocodilians of today are the only remanant off-shoot of the dinosaur stalk. Land reclamation and indiscriminate hunting have threatened the extermination of this animal.

The order Crocodilia consists of the families Crocodylidae, Alligatoridae and Gavialidae. In the case of Crocodiles the teeth of the upper and the lower jaws are more or less in line and are visible when the jaws are closed. The fourth teeth of the lower jaw which is considerably longer then its neighbours, fits into a notch of the upper jaw and can be seen pointing upwards like a tusk. Alligators have their lower teeth inside the upper gaw and the enlarged fourth teeth of the lower jaw fits into a pit in the upper jaw thus becoming invisible.

Crocodiles are found in Africa, South-East Asia, New Guniea, Australia and parts of America. Alligators are restricted to America with the exception of one species of Alligators, which occurs in China. Alligators are not found in India. Gavialis gangeticus or gharial is the only representative of its family Gavialidae and is found in India, Nepal, Burma etc.

The Crocodiles of Uttar Pradesh

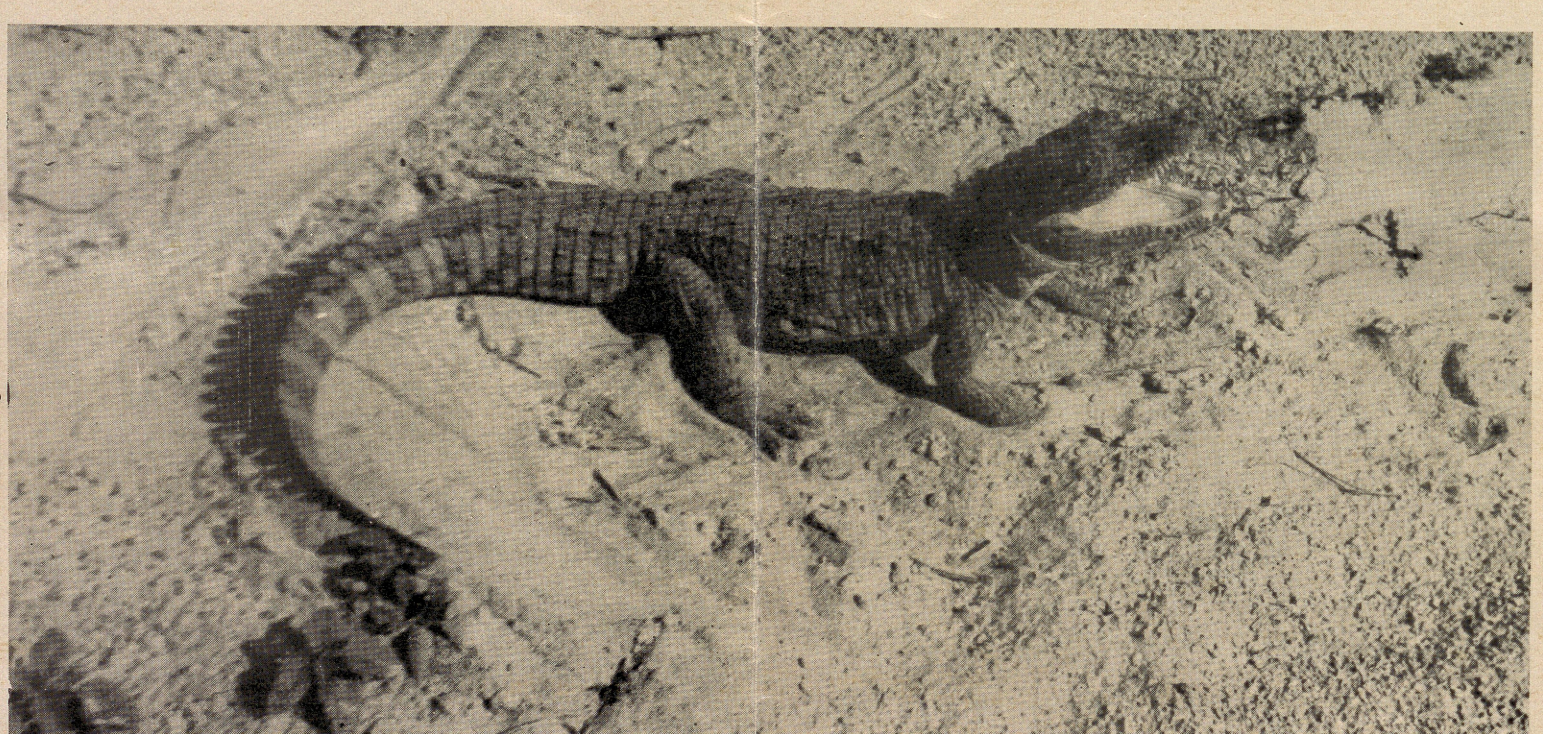
Three species of Crocodiles are found in India of which only two species the Gharial and the Magar are found in U. P. The third species namely the Estuarine crocodile (Crocodilus porosus) does not occur in U. P.

The Magar (Crocodilus palustris) or Marsh Crocodile :

This is a broad snouted crocodile found as far as Iran in the West and Assam in the East. The Magar is found throughout the Indian sub-continent and in the island of Ceylon.

The Gharial (Gavialis gangeticus) :

This narrow snouted crocodile occurs in the Indus, the Ganges, the Bramhaputra, and Mahanadi river systems in the Indian sub-continent and the Irrawadi river system of Burma. This is the only Crocodilian in which sexual dimorphism is characterised during adult



One year old Magar hatchling

stage by possession of a 'Ghara' or protusion on the snout tip of the male. Apart from their larger size and narrow snout the Gharial differs from the Magar in having a different arrangement of armour on their backs, weaker front limbs and stouter tails.

Natural History of Crocodiles :

The Gharial habitat is restricted to the deep pools of Major rivers, while the Magar is found inhabiting lakes, marshes, tanks and small rivers as well. Crocodiles are cold blooded reptiles and derive their heat from basking in the sun and for this purpose they spend most of the sunny days on land. Gharial feeds almost exclusively on fish and turtles, while the adult Magar may go in for goat, cattle and wild game if the opportunity occurs.

Crocodiles are polygamous and a male might mate with three to four females. Mating occcurs in the winter months and the females begin nesting in early March. Nesting sites are on sandy island in dry river bed or on top of high river bank about 15 metres above the water level. Night after night for almost a month she digs nest holes about 1/2 metre deep searching for suitable ground and waiting for the moment to lay her eggs, and lays from 20 to 100 eggs in one of the nest holes and covers them under 30 to 40 cms. of sand. The gharial and Magar both lay eggs in layers separated by sand. The eggs of gharial are bigger than the Magar. Excess of humidity is harmful for the eggs. After 8 to 10 weeks of incubation in the earth's heat captured or retained by solar radiation which ranges between 27° and 35° C the embryos are ready to hatch. They make the fact known by emitting croaking sounds from inside the eggs. The female then excavates the hatchlings from the nest and leads them into the water. The mother remains with the young till the next mating season. The mother, hereafter does not look after them. But for all the protection hatchlings often fall victim to a big fish, a jackal who visits the waters edge at night, some bird of prey or even a big crocodile. In this way less then one percent of all Crocodiles born reach a length of two metres after which they become generally invulnerable to predation.

The Plight of Crocodiles in the Modern World :

Crocodiles were common in the waters of most tropical and sub-tropical countries till two decades ago. A review of gazetteers and journals indicate that all major rivers in U. P. were noted for the large number of gharial they supported and magar were common enough to occur in village ponds.

During the post second world war/era two factors were largely responsible for driving most Crocodiles to the point of extinction and these were the human pressure over their habitat and indiscriminate hunting for trade in their valuable skin.

Concerned with the diminishing population of both the species of Crocodiles these were declared as protected species, and now under the Wild Life (Protection) Act of 1972, the Crocodiles have been given complete protection against killing, netting and trade. All export of Crocodiles and its products has been banned.

The Scheme for Rehabilitation of Crocodiles in U. P.

Rehabilitation work was initiated by the Wild Life Preservation Organisation in the year 1975 and pilot project was taken up for execution with the collection and artificial hatching of a single clutch of gharial eggs. This has now developed into a full fledged scheme and we are receiving financial assistance from the Govt. of India for meeting the capital cost, while the state Govt. is meeting the recurring expenditure.



Gharial hatching from an egg

The manifold activities of the Organisation under the scheme :—

1. *Survey of Crocodiles* : Survey of almost important rivers of U. P. has been done. It is estimated that not more than sixty wild gharials of all ages survive in rivers of U. P.

2. *Egg collection and Artificial Hatching* : Every year in the middle of February the field staff of the crocodile project goes away to the remote stretches of rivers in an attempt to locate new breeding groups of animals. The nests are then located systematically and guarded constantly. The eggs are packed in sand in wooden boxes and transported to the rearing centres very carefully without disturbing the orientation of eggs as found in the nests. After their transportation from the wild the eggs are placed in sand filled cubicals of 1m×1m×1m size at 30 cm. depth. The most important factor for ideal incubation is maintainance of moisture and temperature at the required level. The babies hatch after 8-10 weeks.

The organisation has been successful in collecting and hatching the largest number of crocodile eggs in India, as evident from the table below :

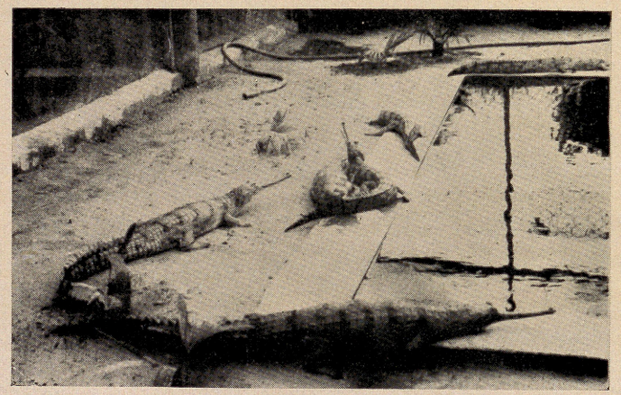
Year	No. of nests located	No. of eggs collected	No. of babies hatched	%of hatching success
1975	1	38	21	55.3%
1976	10	458	364	80.2%
1977	18	712	632	88.9%

3. Crocodile Rearing centres in U. P. : Two such centres have been established. These are located at Kukrail near Lucknow and at Katerniaghat in Bahraich district. The centres have their own tube-wells and water supply systems. The rearing enclosures are designed to provide suitable environment conducive to proper growth and rearing. Strict hygine is maintained and tanks are kept clean and their water is changed regularly. The crecodiles are feed on fish freshly caught from the streams and rivers. The table below will indicate the rearing success achieved at these centres :—

Year	No. of hatchlings obtained	No. of hatchling surving at present	Rearing success
1975	21	12	57.1%
1976	364	273	65.1%
1977	632	586	92 7%

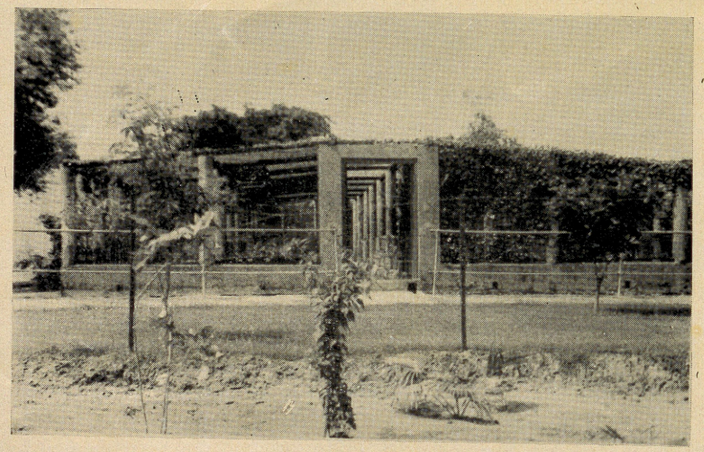
4 Sanctuaries—Katerniaghat sanctuary which includes about 18 kms. of river Girwa was created in 1976 to provide protection to the breeding population of crocodiles in the river. A second gharial sanctuary is proposed to be created to include about 600 kilometers stretch of the Chambal river covering portions of the states of U. P., Rajasthan and Madhya Pradesh.

5. Research—Two research laboratories one at each rearing centre, have been established and the organistation has sponsered two Ph. D. Scholars who are enrolled with Lucknow University for their work on ecology and management of Crocodiles.

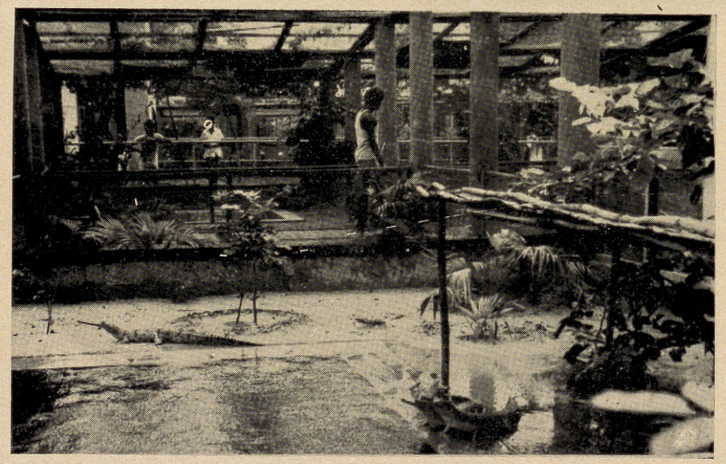


Two year old gharial

Future Management Plan for Crocodile—The future management plan/aims at effective rehabilitation of the two species and will include release of two metre long captive reared crocodiles into suitable natural waters. It is hoped that not more than three years will be required for the hatchlings to attain this size, when they will be fit for release in nature. The second phase of the scheme will attempt at the revival of the hide industry by the establishment of crocodile battary farms. A breeding complex for keeping wild caught magars is presently being developed at Kukrail. There are prospects for earning considerable foreign exchange with successful management of the scheme.

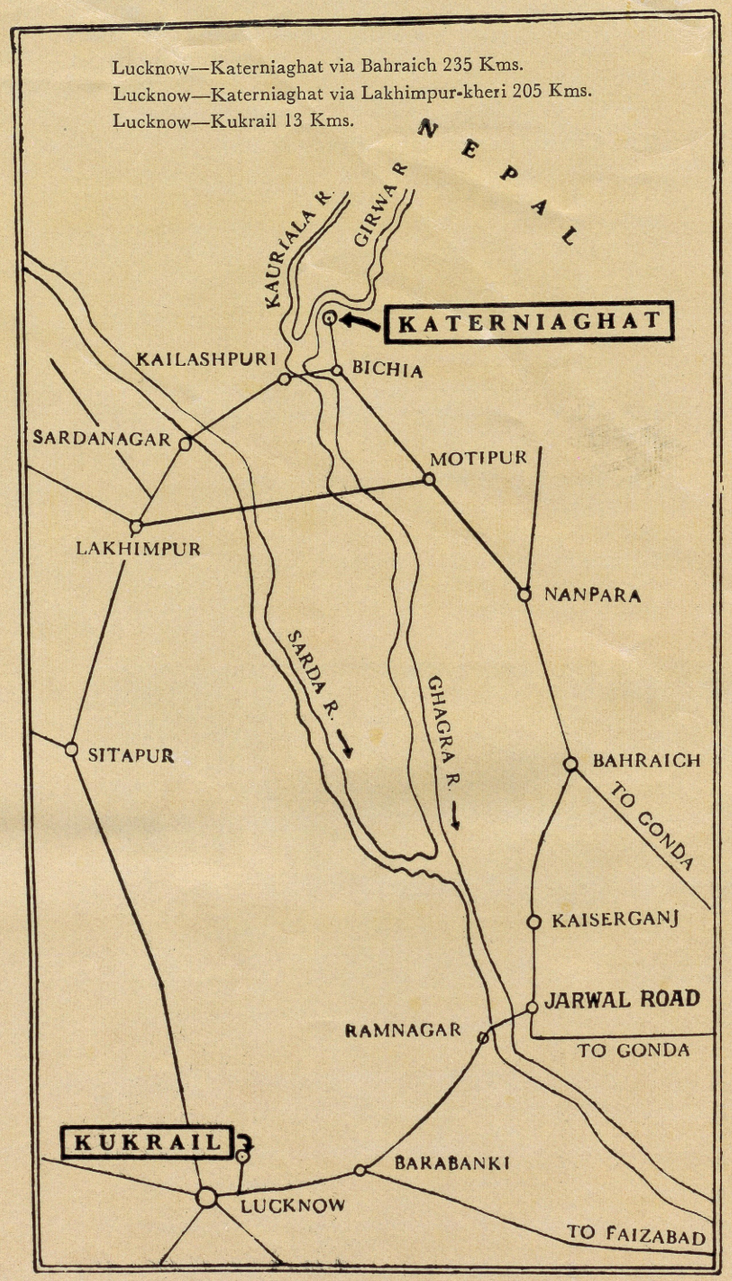


View of Kukrail Crocodile Rehabilitation Centre



View of rearing pond at Kukrail Centre

Crocodile rehabilitation centres in Uttar Pradesh



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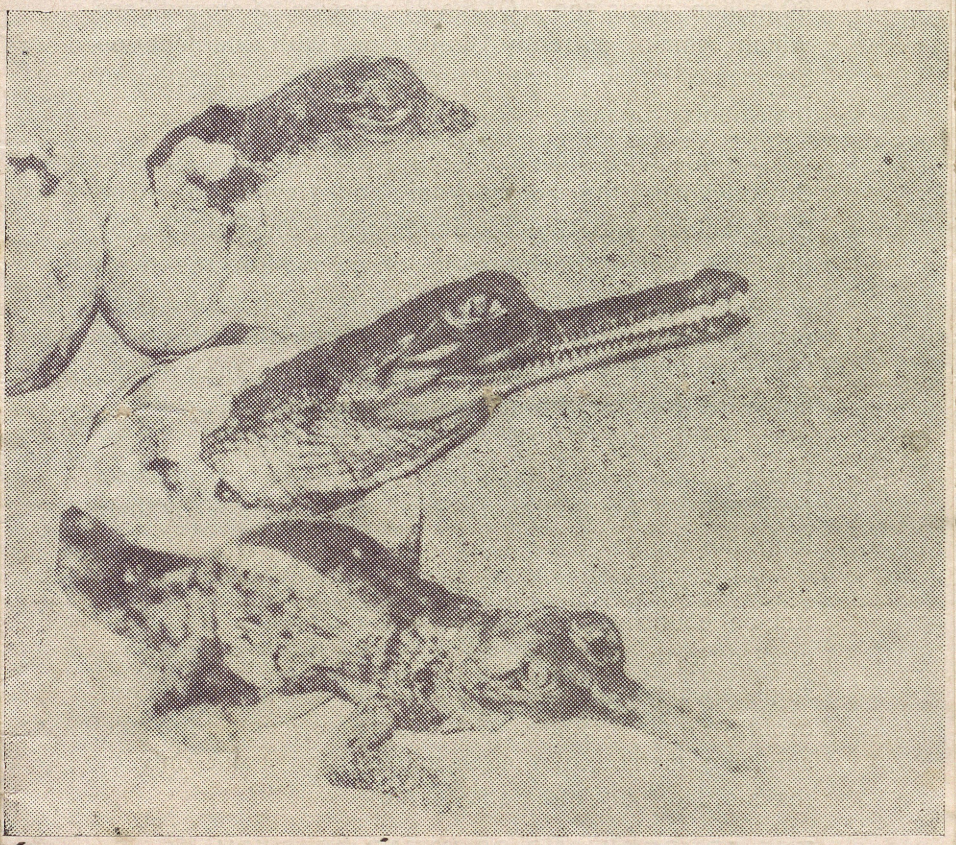
CROCODILE
rehabilitation project



WILD LIFE PRESERVATION ORGANISATION

DEPARTMENT OF FORESTS

UTTAR PRADESH

Crocodile Rehabilitation in Uttar Pradesh

REPTILES were the first vertebrates who were able to colonize land by evolving the hard shelled egg. From the early reptiles arose the mighty dinosaurs which dominated life on land, air and water for nearly 120 million years. Crocodilians of today are the only remnant offshoot of this dinosaur stock which became extinct some 60 million years ago. Of the 21 species of crocodilians which remain, currently 16 are faced with extermination because of indiscriminate hunting and the reclamation of their habitat by man.

Living crocodilians belong to 3 families viz, the Crocodylidae, the Aligatoridai and Gavialidae. The Crocodylidae and Aligatoridai are mainly distinguished by the arrangement of the teeth. In crocodiles, the teeth of both the upper and the lower jaws lie in the same plane and when the jaws are closed, the 4th teeth of the lower jaw which are considerably longer than their neighbours, fit into a notch in the upper jaw and remain visible reminiscent of a tusk. In alligators the 4th lower teeth fit into pits in the upper jaw and is hidden away from sight. The gharial are easily distinguished by their long thin snouts.

Crocodiles are found throughout the tropical and subtropical countries of the world, while alligators are restricted to North and South America with the exception of a single species which is found in China. Alligators do not occur in India. Gharial *(Gavialis gangeticus)* is the sole surviving member of the Gavialidae and occur only in rivers of Northern India and Burma.

THE CROCODILIANS OF UTTAR PRADESH

Of the three species found in India only the Gharial and Magar *(Crocodylus palustris)* occur in U P. The third species the Estuarine crocodile *(Crocodylus porosus)* is found only in the deltaic mangrove swamps of rivers in West Bengal and Orissa.

The Magar or Marsh Crocodile

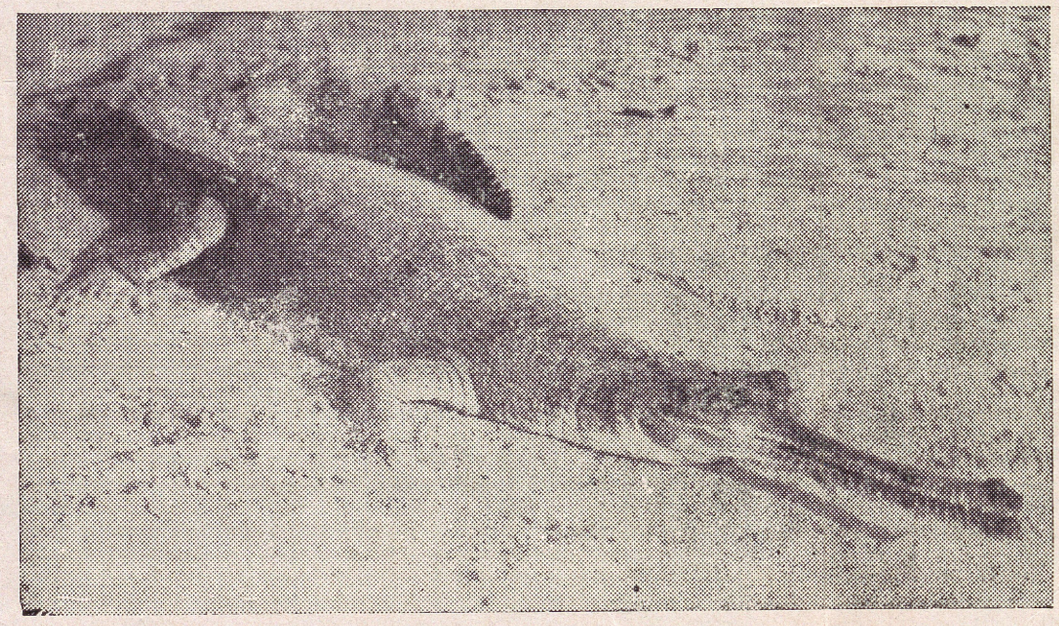
This is a broad snouted crocodile found as far as Iran in the West and Assam in the East. The magar occurs throughout the Indian sub-continent and in the island of Sri Lanka.

The Gharial

The narrow snouted gharial occurs in the Indus, the Ganges, the Bramhaputra, and Mahanadi river systems in the Indian sub-continent and the Irrawadi river system in Burma. This is the only crocodilian in which sexual dimorphism is characterised in adults by the possession of a 'ghara' or a protrusion on the tip of the snout of the male. Apart from their larger size and narrow snouts, the gharial differs from the magar in having a different arrangement of armour on their backs, weaker front limbs and stouter tails.

NATURAL HISTORY OF CROCODILIANS

The gharial occur only in large rivers, adults inhabiting their deep pools, while the magar prefer the stagnant waters of lakes, marshes and small rivers. Crocodilians, being cold blooded animals, obtain their heat by basking in the sun. Nights are spent in the water and the day basking or resting on land. Gharial feed exclusively on fish, the thin jaws being an adaptation for the capture of their slippery prey. Adult magar may catch an occasional goat, cattle or wild game if opportunity occurs.



Three year old gharial

Crocodilians are polygamous and a male may mate with more than three or four females at the end of winter. Female begin to nest by mid-March. Night after night the female gharial leaves the water to dig trial nest holes, searching for suitable ground and waiting for the moment to lay her eggs. In the early April she lays about 40 eggs in a hole about 50 cm. deep, dug on a steep sand bank about 2 Mts. above the water level, where she judges her eggs will be safe from being drowned if the river comes into flood before the babies hatch. Nests have contained as many as 97 or as few as only 5 eggs. It takes a few hours for nesting to be completed and the nest is firmly compacted with the feet. Gharial nest close to water, while magar who are more adept at moving over land, may stroll few hundred meters away from the shore line to lay her eggs in pitcher shaped holes in the earth. After 60 to 80 days of incubation at temperatures between 27°C and 35°C in the heat of the sand which results from solar radiation the embryos are ready to hatch. They make the fact 'known to the mother by croaking from inside the eggs. The mother who has been waiting for her infant's calls now excavates the nest and the hatchlings emerge from the eggs of their own effort, or as in the case of the magar their release may be aided by the mother with the gentle pressure of the jaws which has given rise to the wrong belief that crocodiles devour their own young. Family life is surprisingly complex and both the female as well as the male crocodile often take part in releasing the young and leading them to the water. For the first few months both parents continuously herd the siblings together to protect them from predators, but for all their protection, hatchlings often become victims of big fish, a jackal who visits the water's edge at night, birds of prey or even other big crocodiles. As a result, less than one percent of all crocodiles born reach a length of 2 metres, after which they become generally invulnerable to predation.

THE PLIGHT OF CROCODILES IN THE MODERN WORLD

Crocodiles were common in the waters of most tropical and sub-tropical countries till two decades ago. A review of gazetteers and journals indicate that all major rivers in U.P. were noted for the large number of gharials they supported and magar were common enough to cccur in village ponds.

During the post Second World War era two factors were largely responsible for driving most crocodiles to the point of extinction. These were human pressure over their habitat and indiscriminate hunting for trade in their valuable skin.

To check the decline in their numbers all three species of India were included in Schedule I of Wild Life (Protection) Act 1972 whereby they receive complete legal protection against killing, netting and trade. Export of crocodilians and their products have been banned by separate notification.

THE SCHEME FOR REHABILITATION OF GHARIAL IN U.P.

Rehabilitation work was initiated by the Wild Life Preservation Organisation in the year 1975 and a pilot project was taken up for execution with the collection of a single clutch of 38 gharial eggs. This has now developed into a full fledged project for which financial assistance was received from the Govt. of India to meet the capital costs, while the State Govt. is meeting the recurring expenditure.

The manifold activities of the Organisation under the Scheme are :—

1. Survey of crocodiles

When the project was initiated, all the major rivers of U.P. were surveyed for gharial and this revealed that not more than 60 gharial of all ages survived in the rivers of U.P. Since then periodic survey of rivers are conducted to monitor the trend of the population of gharial in U.P. rivers.

2. Egg collection, artificial incubation, hatching and rearing of gharial

Every year in the middle of February the field staff of the crocodile project goes away to the remote stretches of rivers in an attempt to locate new breeding groups of animals. The nests are then located systematically and guarded constantly. The eggs are packed in sand in wooden boxes and transported to the rearing centres very carefully without disturbing the orientation of eggs as found in the nests.

After they are transported to rearing centres the eggs are replaced in sand filled cubicles of one meter cube, and the temperature and humidity of the sand maintained at the required level for ideal incubation.

The project has been successful in collection and hatching the largest number of crocodile eggs in India.

To-date 7385 eggs of gharial have been collected and 6105 gharial hatched from these giving an incubation success of 83%.

Though the rehabilitation of magar was not included in the project, because of the emphasis the conservation of this

species is receiving in other states such as Tamil Nadu, Gujrat and Maharastra, a small number of magar eggs were collected in the initial stages of the project and a breeding group has been developed which are now producing eggs in captivity.

3. Crocodile rearing centres in U.P.

Two such centres have been established with a rearing capacity of 800 hatchlings and an equal number of juveniles. These are located at Kukrail near Lucknow and at Katernia Ghat in Bahraich district. The centres have their own water supply systems. The rearing enclosures are designed to provide suitable environment conducive to proper health and growth. Strict hygiene is maintained, tanks are scrubbed clean and their water is changed regularly.

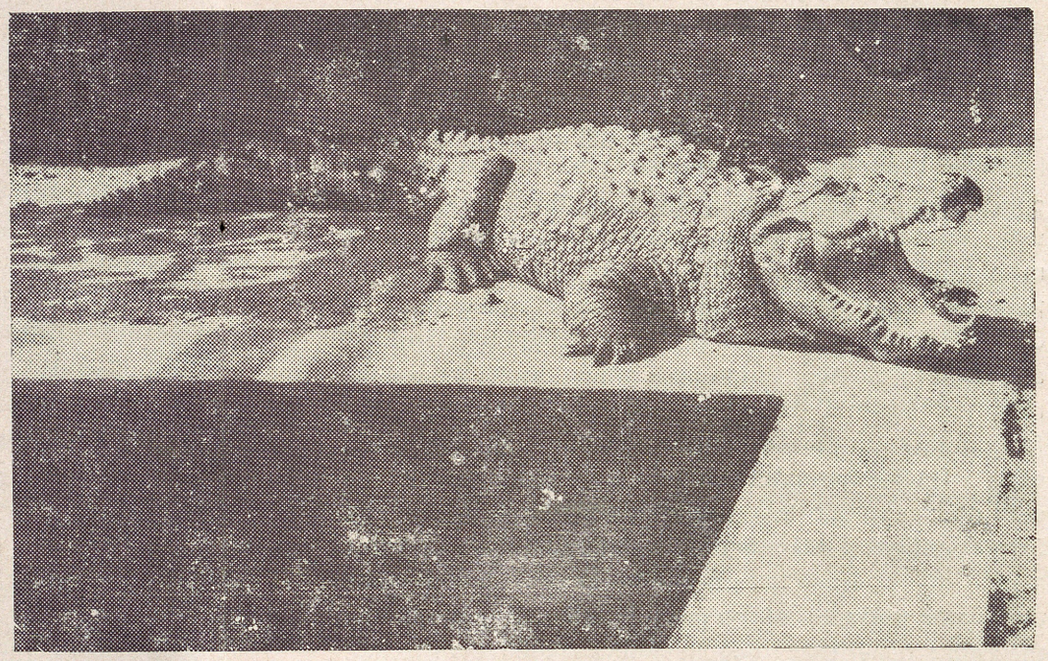
Proper stocking rates are maintained in the rearing ponds to avoid detrimental effects of overcrowding. The complete stock is numbered by coded clipping of the caudal crests and the health of individual animals are monitored by regular weighing and measurement. Special protection has to be provided to hatchlings from extremes of weather and this is achieved by covering entire pens by transparent polythene sheets in winter. Since the inception of the project about 60% of hatchlings obtained have been successfully reared at these centres, a performance which compares favourably with international standards. The crocodiles are fed on fish freshly caught from streams and rivers.

4. Sanctuaries

Katerniaghat sanctuary which includes about 18 kms. of river Girwa was created in 1976 to provide protection to the breeding population of gharial in the river. A second gharial sanctuary known as National Chambal Sanctuary was established in January 1979 to include about 500 kilometers of the Chambal river covering portions in the states of Uttar Pradesh, Rajasthan and Madhya Pradesh. Fishing has been totally banned in the sanctuaries and staff has been posted for enforcement of protection of wild life.

5. Research

Two laboratories have been established one at each rearing centre and the project sponsors 2 doctoral research programmes. So far Ph.Ds on ecology and management of crocodiles have been awarded to 2 scholars under this programme. Data on growth, feeding and health care is regularly recorded and analysed in the quest for the perfection of captive rearing techniques for crocodiles.



Magar

6. Restocking of Sanctuaries and natural habitats

When gharial have attained a length of about 1.5 meters in the rehabilitation centres and are invulnerable to mortality due to predation in nature, they are utilised for a well considered sanctuary restocking programme. The releases are made immediately after cessation of floods and in the higher reaches of sanctuaries preferably in the vicinity of naturally occurring animals of similar size so as to help the released animals to rehabilitate themselves successfully in their new habitat. For this the gharial have to be transported by truck as far as 700 kms. from the rehabilitation centres.

Complete record of the condition of the animal at the time of release and its sex is recorded before release and their identification markings renewed so that knowledge about their dispersal in the rivers may be gained. In these releases which have been an annual feature since 1979 nearly 1500 gharial and about 50 magar have been released so far. The details of the releases are given in the following table :—

Year	Number Released in						Total
	Chambal	Rapti	Girwa	Ghaghra	Ram Ganga	Sharda	
(A) Gharial							
1979	75	—	14	—	—	—	89
1980	110	—	—	—	—	—	110
1981	253	—	46	—	—	—	299
1982	187	—	10	—	12	—	209
1983	158	—	15	—	—	—	173
1984	68	—	19	—	15	—	102
1985	78	—	16	—	—	—	94
1986	60	10	9	20	—	20	119
1987	239	—	35	—	—	—	274
Total	1228	10	164	20	27	20	1469

(B) Magar

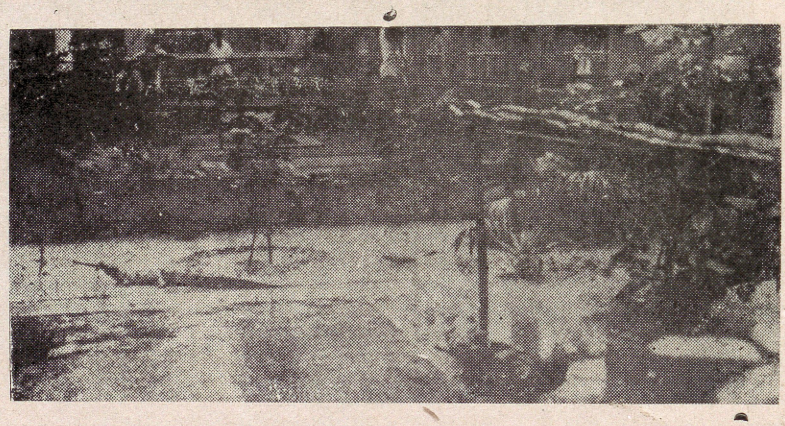
1984	10	—	—	—	12	—	22
1985	—	—	6	—	—	—	6
1986	—	—	—	—	—	—	—
1987	—	—	1	4	—	—	5
Total	10	—	7	4	12	—	33

SUPPLY OF GHARIAL TO ZOOS AND OTHER INSTITUTIONS

Gharial have been supplied from the Kukrail rearing centre to a number of zoos and other institutions both at home and abroad for display as well as restocking of other sanctuaries. They have been sent to Bhutan and Pakistan as gifts from the Government of India and exchanged for other animals with the New York Zoological Park.

FUTURE MANAGEMENT PLANS FOR CROCODILIANS

The rehabilitation centres of U. P. have become important tools in the conservation of the gharial and the egg collection, rearing and restocking of gharial will continue from these centres till expert opinion deems that viable populations of the gharial have been safely re-established in nature. Plans for captive breeding of the gharial are underway and a specially designed breeding enclosure has been constructed at Kukrail. This along with an already operational magar breeding enclosure in which magar have been successfully breeding since 1984 are important foundations for battery farming of crocodilians and the knowhow accumulated from this experience will prove very helpful in large scale farming operations whenever these are initiated in this country. Crocodile leather is an extremely valuable item of international trade which besides earning foreign exchange for the country will benefit mainly economically weaker sections of the population.



View of a rearing enclosure at Kukrail Centre

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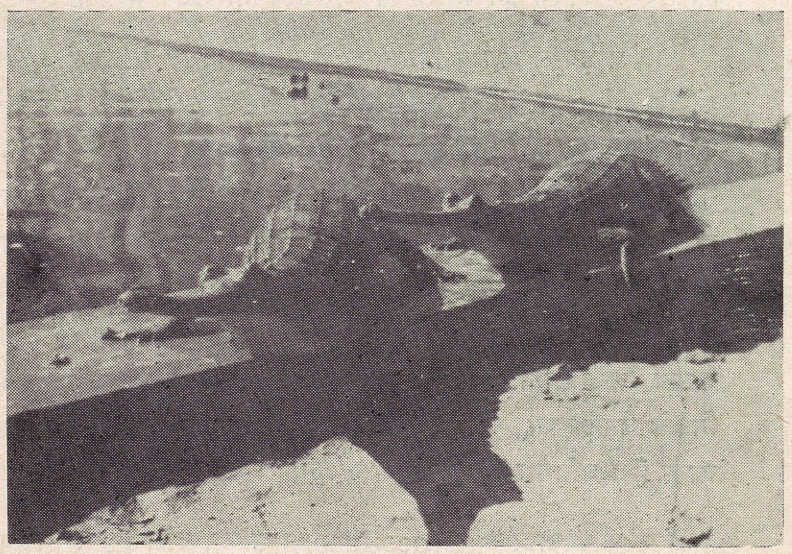
घड़ियाल

पुनर्वास परियोजना



वन्य जन्तु परिरक्षण संगठन

वन विभाग, उत्तर प्रदेश

उत्तर प्रदेश में घड़ियाल पुनर्वास योजना

जल तथा थल दोनों पर रहने वाले जीव-जन्तुओं 'एमीफिबियन्स' के पश्चात् पृथ्वी पर रेंगने वाले जीवों (reptiles) का प्रादुर्भाव हुआ। तत्पश्चात्, विशालकाय जीव 'डायनासोर' का जल, थल तथा नभ में आधिपत्य स्थापित हो गया। धीरे-धीरे इनका अन्त हुए भी लाखों वर्ष हो चुके हैं। आजकल के घड़ियाल, मगर, आदि उन्हीं के वंशज हैं, हालांकि मनुष्य द्वारा इनके अंकुशरहित शिकार के कारण इन जीवों का अस्तित्व भी खतरे में है।

घड़ियाल वंश के अन्तर्गत ऐलोगेटोरायडे, गैवियेलीडे तथा क्रोकोडायलिडे आते हैं। घड़ियाल के ऊपर तथा नीचे के जबड़ों के दांत लगभग एक पंक्ति में होते हैं तथा जबड़ा बन्द होने पर भी साफ दिखायी पड़ते हैं। नीचे के जबड़े का चौथा दांत जो अन्य दांतों के अपेक्षाकृत बड़ा होता है, ऊपरी जबड़े के एक विशेष कटाव (notch) में बैठ जाता है, जो दूर से हाथी के दांत (tusk) की तरह ऊपर उठा हुआ दिखायी देता है। मगर के नीचे के दाँत जबड़ा बन्द होने पर दृष्टिगोचर नहीं होते, हालांकि इसके भी निचले जबड़े का चौथा दांत ऊपर के जबड़े के एक गड्ढे में बैठ जाता है। घड़ियाल का थूथुन (Snout) काफी लम्बा होता है।

क्रोकोडाइल्स (Crocodiles) अफ्रीका, दक्षिण पूर्वी एशिया, न्यूगियाना, आस्ट्रेलिया तथा अमेरिका के कुछ भागों में पाये जाते हैं। एलीगेटर्स (alligators) केवल अमेरिका में ही पाया जाता है, हालांकि उसकी एक जाति (Species) चीन में भी पायी जाती है। वे भारत में नहीं पाये जाते। गैवियालिडे (Gavialidae) कुटुम्ब की घड़ियाल नामक केवल एक प्रजाति (गेवियेलस गेन्जेटिकस) भारत, पाकिस्तान तथा बर्मा में पायी जाती है।

उत्तर प्रदेश के घड़ियाल

भारतवर्ष में पायी जाने वाली क्रोकोडाइल्स की तीन प्रजातियों में केवल दो जातियां–घड़ियाल तथा मगर (क्रोकोडाइल्स पोरोसस) उत्तर प्रदेश में पायी जाती हैं। "एस्चुरीन क्रोकोडायल" नामक तीसरी प्रजाति उत्तर प्रदेश में कहीं भी नहीं पायी जाती है।

मगर (The Magar or Marsh Crocodile)

यह क्रोकोडाइल (Crocodile) का ही वंशज है जिसकी विशेष पहचान इसकी चौड़ी थूथुन (Snout) होती है। यह भारत से लेकर पश्चिम में ईरान तथा पूर्व में आसाम तक पाया जाता है। सम्पूर्ण भारतीय उप-महाद्वीप के अतिरिक्त यह श्रीलंका में भी पाया जाता है।

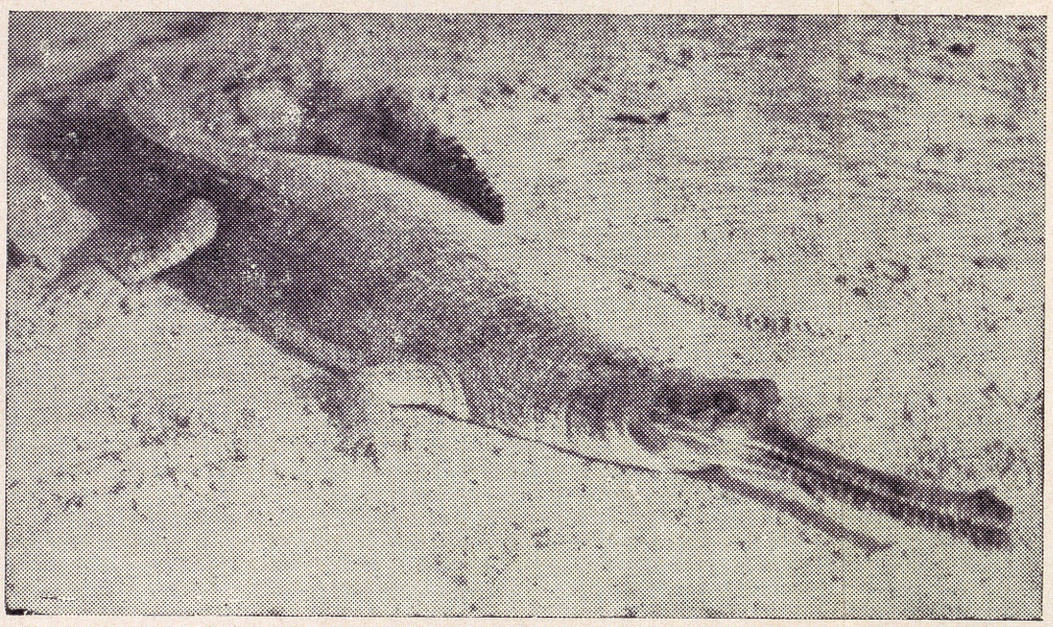
घड़ियाल (The Ghariyal)

यह संकुचित थूथुन वाला घड़ियाल भारत की गंगा, ब्रह्मपुत्रा तथा महानदी की जल शृंखलाओं के अतिरिक्त बर्मा के ईरावदी नदी में भी पाया जाता है। सम्पूर्ण घड़ियाल वंश की विभिन्न प्रजातियों में केवल यही प्रजाति ऐसी है जिसके व्यस्क नर (adult Males) के थूथून पर एक विशेष प्रकार का उभार (protrusion) होता है। मगर तथा घड़ियाल में जो भिन्नताएँ हैं उनमें प्रमुख हैं–घड़ियाल का मगर की अपेक्षाकृत वृहत आकार (Large size), संकुचित थूथुन (Narrow Snout), पीठ पर स्थित कवच (armour) का भिन्न संयोजन, अपेक्षाकृत कमजोर अगले अवयव (front limbs) तथा अधिक शक्तिशाली पूँछ (Stouter tails) का होना।

घड़ियाल का प्राकृतिक इतिहास

घड़ियाल अधिकतर बड़ी नदियों के गहरे जल के कुण्डों में निवास करता है, जबकि मगर झीलों, तालाबों तथा छोटी-छोटी नदियों में भी पाया जाता है। घड़ियाल ठण्डे रक्त का जीव है (Cold-blooded) तथा धूप में सूर्य की किरणों से आवश्यक ताप ग्रहण करता है। यही कारण है कि प्रायः घड़ियाल नदी के किनारे सुनहरे धूप में देह सेंकते हुए देखा जाता है। यह अधिकाँशतया मछली खाकर अपना पेट भरता है, जबकि व्यस्क मगर (adult magar) अवसर मिलने पर बकरी तथा अन्य पशुओं को मारकर खाने में आनन्द का अनुभव करता है।

घड़ियाल सामान्यतः बहु-पत्नी वाला (polygamous) जीव है तथा एक व्यस्क नर घड़ियाल (adult male) तीन से चार मादा घड़ियालों (females) से सहवास (Sexual mating) करता है, जो प्रायः शरद ऋतु के अन्त में होता है। मार्च के महीने के



तीन वर्ष का घड़ियाल

मध्य से मादा घड़ियाल प्रजनन की तैयारी शुरू कर देती है तथा लगातार लगभग महीने भर प्रत्येक रात्रि को पानी से निकलकर नदी के किनारे कोई सुरक्षित स्थान ढूंढ़कर लगभग आधा मीटर गहरा गड्ढ़ा खोदती है जिसमें वह आसानी से अण्डे दे सके। वह एक बार में एक सौ अण्डे तक देती है। अण्डे देने के बाद वह गड्ढ़े को बालू से अच्छी तरह ढंक देती है ताकि उसके अण्डे पूर्णरूप से सुरक्षित रह सकें। इन गड्ढ़ों में कम से कम पांच तथा अधिक से अधिक 97 अण्डे देखें गये हैं। जबकि घड़ियाल अपने अण्डे बालू की परत में (in layers) एक को दूसरे से अलग करते हुए देते हैं, मगर अपने अण्डे एक ढेर में (in heaps) में ही देती पायी गयी हैं। घड़ियाल के अण्डे मगर के अण्डों से अपेक्षाकृत बड़े आकार के होते हैं। 60 से 70 दिनों तक अण्डों को सेने के बाद (incubation) ये भ्रूण (embroys) का रूप ग्रहण कर लेते हैं। अण्डों को सेने की प्रक्रिया धूप से गर्म बालू से प्राप्त 27 डिग्री से 35 डिग्री सेंटी-ग्रेड तक के ताप में परिपूर्ण होती है। चम्बल नदी से प्राप्त अण्डों के लिए 60 दिन तथा गिरवा नदी से प्राप्त अण्डों के लिए 70 दिनों तक सेने का समय (incubation period) आवश्यक है। तत्पश्चात् मादा घड़ियाल (females) गड्ढों को खोदकर अण्डों से फूटकर निकलते हुए बच्चों को पानी में अग्रसर करती हैं। वह अपने बच्चों के साथ अगले सहवास ऋतु (mating season) तक बनी रहती हैं, जिसके बाद उन्हें अपनी देखभाल स्वयं करने के लिए छोड़ देती है, परन्तु मादा घड़ियाल द्वारा सब प्रकार की देखभाल के उपरान्त भी घड़ियाल शिशुओं को नदी की बड़ी मछलियां, रात्रि को सैर को निकला सियार, शिकारी पक्षी और यहां तक की बड़े घड़ियाल स्वयं चट् कर जाते हैं। इस प्रकार कुल जन्में घड़ियाल बच्चों में एक प्रतिशत से भी कम 1 या 2 मीटर लम्बे होने तक जीवित रहते हैं, जबकि वे पूर्णरूप से सुरक्षित हो जाते हैं।

वर्तमान युग में घड़ियाल की दयनीय स्थिति

लगभग दो दशक पूर्व तक घड़ियाल प्राय: अयनवृत्त (tropical) तथा उप-अयनवृत्त (sub-tropical) देशों में पाया जाता था। सम्बन्धित अभिलेखों (records) से ज्ञात होता है कि उत्तर प्रदेश की लगभग सभी नदियों में पर्याप्त संख्या में घड़ियाल तथा मगर पाये जाते थे। यही नहीं इनकी छोटी प्रजातियां गांव के तालाबो में भी पायी जाती थीं।

पिछले द्वितीय विश्वयुद्ध के दौरान घड़ियाल नामक जीव का प्राय: लोप हो गया, जिसके प्रमुख कारण थे–मनुष्यों की उनके क्षेत्रों के आस-पास भीड़-भाड़ तथा घड़ियाल के अमूल्य खाल (Skin) का लम्बे पैमाने पर व्यापार।

इस दुर्लभ जीव को सुरक्षित रखने की दृष्टि से इन्हें वन्य जीव सुरक्षा अधिनियम, 1972 (Wild Life Preservation Act, 1972) के अन्तर्गत सुरक्षित घोषित कर दिया गया तथा इनका शिकार एवं व्यापार अवैध घोषित कर उन पर कड़ा प्रतिबन्ध लगा दिया गया है। घड़ियाल तथा घड़ियाल के किसी भाग से बनी हुई वस्तुओं का निर्यात (export) भी बन्द कर दिया गया है।

उत्तर प्रदेश में घड़ियाल के पुनर्वास की योजना

उत्तर प्रदेश में वन्य जन्तु संरक्षण संगठन (Wild Life Preservation Organisation) द्वारा सन् 1975 में घड़ियाल पुनर्वास की एक परीक्षण परियोजना Pilot Project प्रारम्भ की गई। इस परियोजना के अन्तर्गत 38 घड़ियाल के अण्डों को एकत्रित करके उनको कृत्रिम ढंग से सेने (hatching) की प्रक्रिया अपनायी गई। यह परियोजना अब पूर्णरूप से विकसित हो चुकी है तथा इसके लिए भारत सरकार से भी अनुदान प्राप्त होता है। प्रदेशीय सरकार द्वारा रोज मर्रा के खर्च (recurring) वहन किये जाते हैं।

योजना का विस्तार

1. **घड़ियाल सर्वेक्षण**–उत्तर प्रदेश की प्रमुख नदियों का सर्वेक्षण किया गया था जिससे प्राप्त सूचना के आधार पर अनुमान लगाया गया कि इनमें विभिन्न आयु के 60 से अधिक घड़ियाल नहीं रह गये थे।

2. **अण्डों को एकत्र करके उन्हें कृत्रिम ढंग से सेना**–इस परियोजना के कार्यकर्ता प्रतिवर्ष फरवरी माह के मध्य में दूरस्थ जल प्रभागों का भ्रमण करके घड़ियाल के अण्डे देने के स्थानों का पता लगाते हैं। तत्पश्चात उन स्थलों पर कड़ी निगरानी रखते हुए. सुअवसर मिलने पर अण्डों को एकत्रित करके बालू भरे लकड़ी के बक्सों में रखकर प्रजनन केन्द्रों तक पहुँचाते हैं। प्रजनन के लिए सबसे आवश्यक एवं प्रमुख बात हैं नमीं तथा तापमान का आवश्यक स्तर बनाये रखना। इसमें लगभग 60-70 दिन लग जाते हैं।

उपरोक्त संस्थान ने घड़ियाल के अण्डों को एकत्र करके उनके कृत्रिम प्रजनन की योजना में आशातीत सफलता प्राप्त की है जैसाकि नि म्न तालिका से स्पष्ट हो जायेगा–

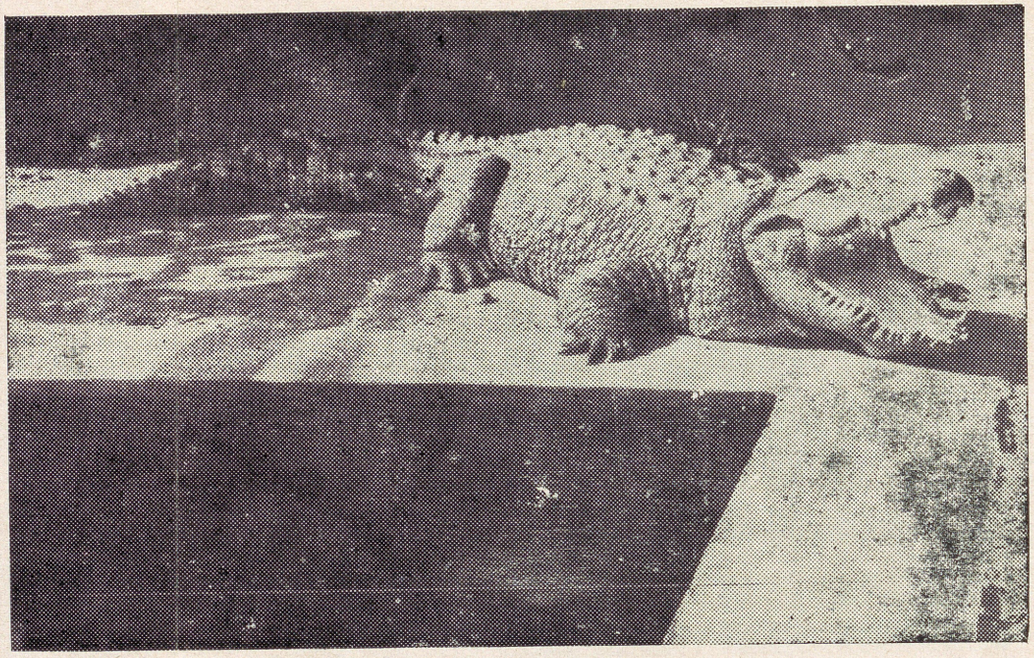
उत्तर प्रदेश में घड़ियाल के अण्डों का कृत्रिम प्रजनन

(अ) घड़ियाल

वर्ष	अंडे एकत्र करने की संख्या	प्रजनित बच्चों की संख्या		जीवित बच्चों की संख्या	सफलता
1975	38	22		18	82%
1976	436	358		305	85%
1977	679	611		338	55%
1978	582	393		214	54%
1979	582	483	33	190	39%
1980	437	394	(प्राकृतिक)	171	43%
1981	486	331		126	38%
1982	563	484		82	17%
1983	391	303		154	51%
1984	722	623		327	52%
1985	880	734		471	54%
1986	898	798		765	—
अन्य स्रोत	—	—		1	—
योग	6694	5534	33 (प्राकृतिक)	3162	—

(ब) मगर

1976	22	6		2	33%
1977	33	21		17	81%
1978	67	39		33	85%
1979	20	9		6	66%
1980	31	19		7	37%
1981	71	64	8 (प्राकृतिक)	23	32%
1982	59	35		4	11%
1983	—	—		—	—
1984	28	12	18 (प्राकृतिक)	9	30%
1985	97	24	14 ,,	12	31%
1986	69	42		42	—
अन्य स्रोत	—	—		6	—
कैमाल	—	—		2	—
खारा पानी	32	25		23	—
अन्य स्रोत	—	—		2	—
योग	529	296	40 (प्राकृतिक)	188	—



मगर शिशु

3. **उत्तर प्रदेश में घड़ियाल के प्रजनन केन्द्र**–ऐसे दो केन्द्र स्थापित किये गये हैं–एक लखनऊ के निकट **कुकरैल** में, दूसरा बहराइच जिले में **कतरनिया घाट** में। इन केन्द्रों में पानी की पूर्ण व्यवस्था है। इन केन्द्रों पर प्रजनन के लिए आवश्यक वातावरण बनाये रखने का पूरा प्रयास किया गया है। तालावों को अच्छी तरह साफ सुथरा रक्खा जाता है तथा चारों तरफ सफाई का ध्यान रक्खा जाता है। तालाबों का पानी नियमित रूप से बदला जाता है तथा घड़ियालों को ताजी मछली का पर्याप्त भोजन दिया जाता है।

4. **पशु विहार (Sanctuaries)**–सन् 1976 में कतरनिया घाट सेंक्चुयरी की स्थापना की गयी थी जिसके अन्तर्गत गिरवा नदी का लगभग 18 किलोमीटर भाग सम्मिलित है। इसकी स्थापना का प्रमुख ध्येय इस नदी में उपलब्ध घड़ियालों को सुरक्षा प्रदान करना था। इसी प्रकार की एक दूसरी सेंक्चुयरी जिसे राष्ट्रीय चम्बल सेंक्चुयरी (National Chambal Sanctuary) के नाम से जाना जाता है, की स्थापना सन् 1979 में चम्बल नदी के लगभग 700 किलोमीटर भाग को सम्मिलित करके की गयी थी। इसमें उत्तर प्रदेश, राजस्थान तथा मध्य प्रदेश के भाग सम्मिलित हैं। उत्तर प्रदेश के भाग में आवश्यक सुरक्षा कर्मियों की भर्ती भी की गयी है।

5. **अनुसंधान (Research)**–उपरोक्त दोनों प्रजनन केन्द्रों (Rearing Centres) पर अनुसंधान कक्षों (Research Laboratories) की व्यवस्था की गई है जिन पर दो पी०एच०डी० के शोध छात्र लखनऊ विश्वविद्यालय द्वारा इस कार्य पर नियुक्ति किये गये हैं।

U P

YEAR	GHARIAL	SW. CROC	MUGGER
1975	10	×	
1976	359	×	
1977	586	2 ♂ exhibit for breeding	
1978			
1979			65 (Basu)

Releases

Dr. Choudhary (1) Etawah
14-9-79

Namskar

I have been posted in National Chambal Sanctuary Project (राष्ट्रीय चम्बल विहार परियोजना) with Headquarter at Etawah (temporary). I have joined here on 11 Sept 79 after a long waiting at Lucknow from 3 Sept to 10 Sept. 79 for posting. Etawah is a district place very similar to your Angul. It is inhabited on ~~Chambal~~ Yamuna riverain (बीहड़) with undulating configuration. Everything is new including me. No residential building & staff is available. At present I am staying in a hotel. I am searching a rented building for office cum residence.

All facilities provided by Central Government like special pay Rs. 100-00, fix T.A. 150-00 & etc. has been cut by state Government. Further we are not getting the Scale Rs. 425-700 as proposed by Central Government for Project. Regarding economy & facilities I am in a very precarious position. My colleague in territorial, research ranges & even in spacial duty like Tiger project, National parks, Working plan & soil conservation are enjoying — good accomodation, Orderly, dafria, cleark, & special pay in special duty & other legal & illegal facilities.

In true sense after the 2nd month training I have been degraded to the ranks of Forester. Frankly telling, I am interested in wild life. Due to sheer interest I gave the choice without any thinking of past & future. My colleagues & others were repeatedly forcing me not to join wild life wing. Try for other service, if luck is not with you, remain in territorial or other wing. What is the necessity of all these Nonsense.

Now all my friend are in charge of some range, still I am [illegible] on the street.

~~There is a proverb in Hindi — "भूखे भजन न होई ही गोपाला" (Worship of God cannot be done with empty empty stomach).~~ I am unable to understand the policy of Government. If the State Government is unable to meet minimum living status of the field staff due to its financial lack, what is the necessity of creating the post of Project officer with head quarter at Etawah & Deputy conservator of Forest (Breeding Centre) with headquarter at Lucknow. You & other such devoted personnel, honestly, have ~~releas~~ realised the fact that actual work done by the field staff. ~~But~~ These giant with gigantic pay & facilities ~~only~~ have been posted only to maintain office & paper work. But this is the misfortune of India that they are unable to fulfill paper work in time. The State Government is not cutting the special pay & other facilities proposed by Central Government under the scheme. In case of Deputy conservator & Project officer. They are getting ~~Rs 200~~ Rs. 200=00 & Rs. 100=00 as special pay respectively. Pay & facilities given to Deputy conservator of forest (Breeding) with head quarter at Lucknow is equivalent to pay & facilities provided to all field staff (Range officer, field assistant & other). At present there is no necessity of these two giant posts. If State Government want to provide minimum & create some interest & devotion in field staff, gave something so that they will easily meet their livelyhood & expenditure of their children education. If there is a financial difficulty, cut one of the giant post either deputy conservator or Project officer, & from that money State Government can easily meet the minimum of field staff. Very much necessary, in that case post one senior Ranger officer with one to two clerkial staff for paper work & contact.

If you happen ~~to~~ visit ~~of~~ the office of the ~~the~~ Deputy conservator (National Chambal Sanctuary Project) 13, Lajpat Rai Marg, Nanpara house, Lucknow, ~~[illegible]~~ simply displaying

with chair in 5 mt. X 4 mt size room with 10.00 AM to 5.00 P.M.

I am very keen to utilise my ~~I m~~ 9th month knowledge by ~~dom~~ identifying birds, wild animal & Reptile found in Sanctuary & studying their ecological behaviour. This is pity that there is ~~to~~ no provision for providing Venacula, Camera & ~~other~~ book (necessary) to only trained Range officer. During a discussion, my Deputy Conservator told that there is no provision to provide all these article to Range officer. Crocodiles ~~are~~ will be clearly seen from a long distance with naked eye. Only for knowing the year of release (scute cutting), close observation is required. There is a Rs 5000.00 provided in scheme to ~~give~~ equiped the field asistant & Project officer with all these instrument.

This is the begining, I donot want to expose my knowledge over my boss considering my carrier & long service. Under all these precarious situation & poor condition, "which kind of devotion & hard labour is expected from me or person ~~at~~ my position" please tell me frankly. There is a proverb in Hindi - "भूखे भजन न होई गोपाला (worship of God can not be done with empty stomach)"

At present, I am preparing plan & estimate for project officer residence & office, ~~off~~ residence of clerks & orderly, residence of Range officer & field Asistant. From the next week I am planning to visit sanctuary, for deciding the ~~the~~ headquarter of Range officer, field asistant ~~[illegible]~~ amidst of the Chambal reveraine, with no schooling or communication facilities. If Range officer want to give his children better education, he has ~~two~~ two residence one at Etawah & other headquarter in field. He kept the family at Etawah & lived like bechalor (unmarried) & at the same time expenditure will be become double; But these are not the case with our bosses.

Please tell me about the selection of the Assistant instructor. If the Director assure me for selection, I will surely get the ~~[illegible]~~ permission from my chief Conservator of Forest.

With hope of your good health & bright future, I am ending the letter here. I hope that you will give reply to my letter surely. In next letter I will write about Etawah region, their culture, alocoity of crocodile conservation in U.P. & some details about sanctuary. You have promised to give photographs the list of which given by me. Please write about the required amount.

Convey to my heartly Namaskar to Vara prasad. If you have received the letter of Mr. V.K. Johri, write the address of Johri in your letter.

If you find something wrong in my letter, it is due to poor English, Please took it in good sense. I have great regard for your unique interest, devotion & knowledge.

Ram Naresh Yadava
(Forest Ranger, Chambal Project)
C/O Deputy Conservator of Forest
South Doab Forest Division
Forest Park, Civil line
Etawah (U.P.)

ETAWAH.

Nehru Zoological Park,
Hyderabad -500 264.

Dated 18th November 1979.

Dear Mr. Yadav,

Late reply is usualy not my practice, but at times it becomes an exception. This happens when I am too tied up with some other work. In your case one of your state Research Scholar took quite a considerable part of my time so as to keep your letter waiting for more than two months. Well, you must have considered your letter a dead loss and a sheer waste of time. I repeat again-whoever writes to me usually gets a reply (even though it is late).

I am really sorry to learn all the difficulties in your working conditions. Hope by now things must have improved a lot. Have you already got a h-ouse to serve as your office cum residence? There is a co-ordination meeting of the Chambal Gharial Project on the 20th of this month. I am sure some of your difficulties can be discussed there. I knew a lot about your D.F.O from mr. Sushant Choudhury. As is the practice in the Forest department your D.F.O has considered Lucknow as the best place for his H.Q. Let the field staff go to hell, who bothers. As long as the big bosses get their previlege nothing else matters. Things are bound to change in the future, at least when you people with proper thinking are going to run the show.

I was informed by Sushant that U.P is releaseing some 250 gharials in to the Chambal river sanctuary very soon but unlike last time this time the release will be carried out over large streches of the river. Let me know what are the preliminary work being carried out prior to the actual release. Have they(you) surveyed the areas where you are going to release the animals?

Your Institute director Mr. Pushp Kumar has gone to U.S.A for a period of three months on a F.A.O fellowship to study the Marine Land Complexes already existing there in the U.S.A and the south east Asia. He is expected back by the first week of January. Present acting director is Mr. Madan Gopal of the Tree breeding project. The next course is to start by the first week of December. I think there are already some 12 names for the course.

I have received letters from almost all of you except Bandhu and Ritesh Appukuttan. Prasad is now in my project and both of us have already done some good field work. Why dont you write to him and ask him how he is liking his job, I am sure he likes the job but not his boss.

Your Foren (Videshi) guru Dr. Bustard has become the father of a baby girl only a few days back. He is as usual busy with his work . Now I have Mr. Sudhakar Kar of Bhitar Kanika Sanctuary here with me. He will be here for about two months. He is here to write his thesis. Dr. Sale is now at Kaziranga(Assam) to see the possibility of shifting some Rhino in to new areas - possibly to reintroduce Rhino in to U.P.

I have no idea about the Asst. Instructer selection. Now that the Director is not there I rarely go and talk to your Dr. Loo and Rajamannar. I think some applications of first batch of trainees have been sent to the center for approval. I don't know whose.

V.K.Johari has sent me a diwali greetings card but forgot to write his address in it. So, I have not written to him. He is perhaps joining at Morena.

Please rest assured of a much quicker reply to your next letter. So you should write me the soonest possible giving me as much information as you can.

With best wishes and kind regards,

Yours sincerely,

P.S : What is the political situation like in U.P.? Any chance of Charan coming back to power. I bet he won't !

Uptill now I have visited the whole portion of sanctuary. In my opinion this is the best stretch of river for the conservation & development of aquatic fauna. The Chambal river is quite safe from modern industrial abuse since vast spreaded ravine along Chambal river have left no scope for development of big cities. In first look, the vast ravine gives the appearance of fearfulness & no human habitation. If you enter inside the ravine, you will find the man with axe & cattles everywhere. Each bit of land is cultivated without any consideration from the point of soil conservation. It seems that the main aim of the people living in these ravine is to grow grain & milk for their livelihood at the cost of Forest (or stable land). They see clearly that the every year a good number of village & cultivable land is made useless due to spread of ravine. The people are not conscious about this man made havoc, never try to know the root cause of the spread of the ravine & find out the other healthy alternative for their livelihood. They have not taken any ~~lesson~~ lesson from the havoc happening every year in front of them. ~~Their believe~~ Their believe on God & Luck has never allowed to think on scientific line. They accept that every event, good or bad, will happen according to liking or disliking of God. Whole thing is that ~~the~~ men & cattle are the main hinderance in conservation & development of wild life in this ideal area. Rest is O.K.. Please do not mind any thing if wrong in writing. Rest in Next letter. Please convey to my Namskar to Prasad. Ram Naresh Yad
Etawah

पर्ची काट कर खोलिए TO OPEN CUT HERE

अन्तर्देशीय पत्र कार्ड
INLAND LETTER CARD



INDIA 25

To,

Sri B. C. Choudhery
2 ~~Ze~~ Nehru Zoological Park (N.Z.P.)
Bahadur Pura,
Hydera Bad (A.P.)

पिन PIN

तीसरा मोड़ THIRD FOLD

पहला मोड़ FIRST FOLD

दूसरा मोड़ SECOND FOLD

इस पत्र के भीतर कुछ न रखिए NO ENCLOSURES ALLOWED

प्रेषक का नाम और पता :— SENDER'S NAME AND ADDRESS :—

[illegible] (Range officer, Chambal) Forest Park
Etawah (U.P.)



पिन PIN

3-1-80

Dr. Choudhery

Sadar Namskar (सादर नमस्कार)

With best wishes for the year 1980.

I received & knew about your happiness from your long waited letter. I am quite well here & hoping same for you. I am feeling somewhat guilty for my late reply.

I want to know about the numbers of trainees & state which they belong. From U.P. one name is proposed & that man is forced by C.C.F. & other higher officer to join the Institute to save the International & national fame & status which the U.P. has earned in the field of Wild life Preservation under the able guidance Mr. V.B. Singh, Chief Wild life Warden of U.P. But that man is not willing because he is incharge of a Territorial Range. He is trying hard to get rid off training. But seeing the present position & mode of higher Bosses, it is 99.9% sure that ultimately he will force to join the institute in II nd week of January 80 after the Election duty.

When will the trainees come to visit Kukrail & Katerniaghat, U.P. Ghorial Project? Are they coming for egg collection of Ghorial in National chambal Wild life Sanctuary? You are accompanying the training during above visit or not. Please write about these. If convenient desire to see the Future Indian Wildlife Manager & meet the Instructors & Crocodile experts.

It is well known to you that Dr. Ja B. Sale has visited the U.P. portion of National Chambal Wildlife Sanctuary (N.C.W.S.) from 22 Nov. to 24 November 79, with aim of writing the Management Plan for sanctuary. The duration of visit is very short & we are able to show only important portion & mainly boundary of the sanctuary. My meeting with Dr. Sale is very good & spent three days happily with a good discussion about Sanctuary & other things, good or bad. It was a great tragedy with me that DFO is strictly vegetarian & do not like Camp arrangement or any such things. He proceeds on tour with his kitchen box. Therefore Dr. Sale was compelled to take simple vegetable & breads.

Further Dr. Sale had visited the N.P. portion of sanctuary on 11-12-79 to 12-12-79. I got a telegram from Dr. Sale, but I could not attend this visit because my DFO & Mr. V.B. Singh (Chief Wild life Warden) visited the sanctuary on above dates. If you meet with Dr. Sale, please explain the cause of my absent during M.P. visit & request for execusion on my behalf. I am unable to write Dr. Sale because of lack of english knowledge.

I appreciate your choice of ~~picture post~~ Greeting card. You know very well that I am a BHARATIYA (भारतीय) & new year of a Bharatiya begins after the Holy festival (in case of farmers) & Deepawali (in case of business many). I believe to convey & accept best wishes of new year on that occasion.

by the fact that R.W. ~~sent~~ submitted the abstract without prior consultation and that it takes 20 days for letters to go to P & NG and that I have misplaced Roms covering letter which he wrote to me.

I hope your trainees are training ~~who~~ well and that Mr Pillai is doing fine. Please convey my regards to him. That's all for now would like to see some of your work so try and get as much out in print as soon as possible. How is the fake AP Ghanal Sanctt. Coming along with best wishes

Basu

पहला मोड़ FIRST FOLD

अन्तर्देशीय पत्र कार्ड
INLAND LETTER CARD

भारत
25 INDIA 25

To
Sri B.C. Choudhari
Crocodile Project
Nehru Zoological Park
Hyderabad 500264

पिन PIN

तीसरा मोड़ THIRD FOLD

इस पत्र के भीतर कुछ न रखिए NO ENCLOSURES ALLOWED

प्रेषक का नाम और पता :— SENDER'S NAME AND ADDRESS :—

Basu

पिन PIN

दूसरा मोड़ SECOND FOLD

पत्री काट कर खोलिए TO OPEN CUT HERE

Kukrail
~~500~~ 10-4-80.

Dear Binod,

Thanks for your letter of 24/3 and the felicitations.

How are you and your work getting along?

About the questions you have asked,

1) The break up of the releases is as follows.

April 1979	14	gharial	5	hatched	75	at Katarnia Ghat
			9	"	76	
May 1979	15	-"-		"	76	at Chambal UP/MP border
November 1979	30	(15+15) -"-		"	76	-"-
December 1979	30	(15+15) -"-		"	76	-"-
Feb 1979	15			"	76	-"-
March 1980	50.		40	"	76	~~[illegible]~~ MP/Rajasthan border
			10	"	77	
-"- 1980	45		38	"	76	UP/MP border
			7	"	77	

Total 199.

This is for satisfaction of personal curiosity

2) Our egg colln. is going on schedule and we hope to collect about 500 eggs from Chambal alone this year.

3) Magar nests collected in April are laid around the 20th April much later than gharial laid on the 1-7 April.

4) I am supposed to be writing one on gharial ecology biology fairly comprehensive covering most aspects with Rom Zai & LAKSingh but this is a problem ~~[illegible]~~ ridden proposal complicated

अन्तर्देशीय पत्र कार्ड
INLAND LETTER CARD



Shree B. C. Choudhery
Andhra Pradesh Crocodile Project,
Nehru Zoological Park
Hyderabad
(A.P.)

पिन PIN

तीसरा मोड़ THIRD FOLD

इस पत्र के भीतर कुछ न रखिए NO ENCLOSURES ALLOWED

प्रेषक का नाम और पता :— SENDER'S NAME AND ADDRESS :—

National Chambal Project
Etawah



पहला मोड़ FIRST FOLD

दूसरा मोड़ SECOND FOLD

With Due Regard 8-6-80

Being quite well, I hope same for you,

I am coming Hadeerabad, Crocodile Institute befor or on 15th June to take Binocular & Camera for use in National Chambal Sanctuary Project U.P., If you do not have, any unavoidable engagement, Please make yourself available there, ~~It is my heartest desire~~ I want to meet you. It is my heartest desire Please Convey to my Namskar to Mr. K. Varaprasad & inform about my Proggramme. If he is ~~me~~ can make ~~himself~~ himself available, I ~~am~~ will become very happy. Further Please Convey to my Namskar to Mr. Mohan Billai.

~~I am~~ Everything is going quite well,

Rest O.K.

Details after meeting

Ram Naresh Yadava
Etawah

Nehru Zoological Park
Hyderabad
20th June 1980.

My dear Basu,

Thanks for your letter of 10/4 giving me information about the Gharial Releases in UP/MP/Rajasthan. Hope in the meanwhile you people have decided about further releases. Let me know when you do. I am planning from now to try to come to Chambal next year to carry a Gharial nesting season for comparative study. I don't know if I can manage to be out for one month in UP leaving my project here. Let me know what should be the best time for this. I would like to be there before the peak egg laying period. Perhaps before the first nesting starts. I hope to get some assistance from the MP people (Forest Department) and of course I count your help to be the most. I will be writing to the Concerned Chief wildlife Wardens regarding this.

We could collect some 5 nest of mugger this year and we have for the 1st time in AP some 50 hatchlings. Our captive muggers have also started breeding.

Last month I was in Tamil Nadu for 10 days doing monitoring of released crocodiles of 1975 and released 47 muggers of 1976, 77, 78 stock of Hogenakal into the Cauvery river. I might participate in the release of next batch of mugger in TN. We have also released 33 muggers into the wild at Kinnersani in Andhra Pradesh.

Let me know about your activities.

With best wishes to you and your wife.

Sincerely
Bivash Chandhury

will be completed up to November or Mid of December.

Rest is O.K., Now I am going to end the letter. Please excuse for any mistake.

With kind regard

[signature]

(R.N. Yadava)
(Range Officer, Chambal)
Forest Park, Civil line
Etawah (U.P.)

पहला मोड़ FIRST FOLD

अन्तर्देशीय पत्र कार्ड
INLAND LETTER CARD

भारत
25 INDIA 25

To

Shri B.C. Choudhury,
Andhra Pradesh Crocodile Conservation Project, Nehru Zoological Park
Hyderabad
(A.P.)

पिन PIN

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इस पत्र के भीतर कुछ न रखिए NO ENCLOSURES ALLOWED

प्रेषक का नाम और पता :— SENDER'S NAME AND ADDRESS :—

R.N. Yadava
Etawah

पिन PIN

[illegible] TO OPEN CUT HERE

Respected Dr. Choudhury

Etawah
30-8-80

Namskar

I hope that you are quite well & happy there.

There is a radio news at 2 P.M. on 2 August 1980 that the Crocodile Institute Hyderabad will be transfered from Hyderabad to Jabalpur (M.P.). Is it true? Please write ~~it~~ in your letter.

Here everything is going well. I have sent an article ~~to Chan~~ "Chambal & Its Ravines" for Makara, but uptill now ~~I~~ I am not get any letter from Editor of Makara that it will be publish in the next issue of Makara or not.?

Our Surveyor Mr. D. Basu is trying to go Papna-Nergini. For this he is making contact with Mr. Rom Vitakar.

The Scholarship of Both the research scholar Dr. S. Choudhary & Dr. Srivastava is finished. Sometimes Mr. V. B. Singh, Our Chief Wild life Warden, gave assurance to them for absorbing in at department. But ~~they have~~ Our Chief Wild Warden & Other related officer have wrong impression for them. I do not know the reason.

Please convey my Namskar to Mr. Varaprasad & Mr. Pillai.

This year there is a programme to release 400 ~~to~~ juveniles of Gharial in Chambal. Last year i.e. in 1979-80, 185 Gharial juveniles were released in chambal in upstream at different places. This year release

अन्तर्देशीय पत्र कार्ड
INLAND LETTER CARD

भारत
25 INDIA 25

To
Mr. Binod Chowdhury.
Res. Officer Crocodile Project
c/o Nehru Zoological Park
Hyderabad (A.P)

पिन PIN

तीसरा मोड़ THIRD FOLD

इस पत्र के भीतर कुछ न रखिए NO ENCLOSURES ALLOWED

प्रेषक का नाम और पता :— SENDER'S NAME AND ADDRESS :—

पिन PIN

पहला मोड़ FIRST FOLD

दूसरा मोड़ SECOND FOLD

TO OPEN CUT HERE

c/o C.N. Harde
B-1134 Ram
Sagar Misra Nagar.
Lucknow 226016.

Dear Binod,

Hope This letter finds you fine.
I am writing to seek the present whereabouts
designation/adress etc of Dr Bustard and
request that if these are available with
you to kindly send the same to the above
adress at your earliest as I need to
communicate with him urgently.

Thanks and with best
wishes.

Yours sincerely

D Basu 9/12/87.

(D. BASU)

Binod C. Choudhury

NEHRU ZOOLOGICAL PARK
HYDERABAD - 500 264.
INDIA

9/9/1983

Dear Dhruba,

Nice to hear from you. Glad to know that you are doing your B.Sc. I wish you all the best in your academic pursuit.

Regarding the papers you mention in the Bibliography I think you will have to write to the authors for reprints. Infact I doubt have most of them with me. The CCBMTI (now the Croc Research Centre) wanted to accumulate all publication but I don't know if they have. Please write to John Sale at Dehra Dun and the officer in charge at CCBMTI regarding this.

I am enclosing herewith a copy of the Katreniyaghat symposium proceedings which we could manage to publish. Lake and myself have spent almost Rs 500/- each to produce 150 copies of this. I don't know if other researchers are going to meet (share) the expenditure or not.

Could you do me a favour. Please send me the feed schedule of Katreniyaghat

kukrail complex. What food is given to what size crocodile/Gharial and for how many days a week. Please do this in the format given below.

Hatchlings	wt-	Qty of food fish read-
0.3m to 0.5m	100gm to 1kg	
0.5m to 1m		
1m to 1.5m		
1.5m to 2m		
2m as above		

Gharials
and
S.W. Crocodiles

I need this rather urgently.

Thanks for writing and hope to hear from you soon. Best wishes

Bivash

D-2095, INDIRANAGAR
LUCKNOW 226016
21st August 1983.

Dear Binod,

A long time has passed since we have exchanged news, I hope you are fine.

I am carrying on here in my old capacity of Surveyor, trying my best This ~~Ba~~ year to prevent the heavy mortality of the hatchlings which was tending to become a routine feature here at Kukrail. I see that you have made steady academic progress and supplemented your doctorate with many ~~ooo~~ publications, my heartest congratulations! I too am trying to establish my self and have progressed as far as passing the 1st part of the B.Sc. of LKo Univ in Zoo/Bot/Chem this year. I have recieved a copy of "An annotated Biblio. of Indian Aocs. and wish to thank whoever was ~~responsible~~ responsible for sending it to me.

I was wondering if you ~~know~~ know of any central place where the references included in ~~anno~~ Bibliography are available. Also if I wish to obtain Xeroxed reprints of the references on payment of necessary expenses, is such a facility is available and whom should I contact about it. Furthermore if these reprints are available where you are could you kindly oblige by sending me.

Copies of papers no. 39, 41, 51, 63, 87, 95, 96, (Gharial). If you could inform me the cost of reproduction per page I would be happy to send the amount without delay.

Hoping to hear from you soon, I had a chance to meet Sudhakar Kar when he visited Lucknow to exchange a male porosus for 2 females. With best wishes

Yours sincerely

(D. BASU)

To
Dr. Binod Chowdhury
Nehru Zoological Park
Hyderabad 500264

Dr.L.A.K.SINGH
Lecturer/Research Officer
Crocodile Research Centre of the
Wildlife Institute of India

Camp: National Chambal Sanctuary
P.O.Box 11, Morena-476 001

D.O.No.26/CRC/WCS/337

Dated: 22nd July 1984.

Dear Sir,

As discussed on the 11th July 1984, at Dehra Dun, I am submitting with this a note indicating the abstract of the results reported in Interim Reports 1 (April 1984) and 2 (July 1984) based on past one year's study in the National Chambal Sanctuary.

With kind regards,

Yours sincerely,

Encl: as above.

(Dr.L.A.K.SINGH)
Lecturer/Research Officer

Shri V.B.Saharia,
Director,
Wildlife Institute of India,
P.O.R.I. Campus, P.O.New Forest,
Dehra Dun-248 006.

Copy of the Abstract for favour of information to:

1. Shri J.J.Dutta,
Principal Chief Conservator of Forests, Madhya Pradesh,
Satpura Bhavan, Bhopal.

2. Shri N.K.Joshi,
Chief Conservator of Forests (Wildlife) Madhya Pradesh,
1st Floor, B Wing, Satpura Bhavan, Bhopal.

3. Shri O.P.Mathur,
Chief Wildlife Warden, Rajasthan,
Van Bhavan, Jaipur (Rajasthan).

4. Shri C.P.Singh,
Chief Wildlife Warden, Uttar Pradesh,
17 Ranapratap Marg, Lucknow (U.P)

5. Shri R.S.Bhadauria,
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6. Dr.J.B.Sale,
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7. Shri P.C.Agrawal,
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National Chambal Sanctuary,
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Lucknow (U.P).

contd.....2...

8. Shri S.K.Dixit,
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P.O.Box 11, Morena-476 001 (M.P)

9. Shri S.P.Sharma,
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10. Shri K.C.M.Pillai,
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12. Dr.S.Kar,
Research Officer,
Crocodile Project,
Office of the Divisional Forest Officer,
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(Dr.L.A.K.SINGH)
Lecturer/Research Officer.

ABSTRACTS OF INTERIM REPORTS 1 (April 1984)*and 2 (July 1984)**

In order to study the population dynamics of gharial (Gavialis gangeticus) in National Chambal Sanctuary a field camp of the Crocodile Research Centre of the Wildlife Institute of India was set up in June 1983 at Deori, in Morena District of Madhya Pradesh. Among the various studies undertaken during the last one year one is a habitat reconnaissance and preliminary census along 467 Km river length to determine the effect of releases of gharial juveniles and the present trend of population growth, and the second is on designing a radio-tracking study for gharial juveniles and analysis of the movement patterns. Some of the results of these studies are as in the following:

1. Keshoraipatan to Pali, a stretch of 142 Km in Chambal and 10 Km of Parbati upstream of its confluence with Chambal at Pali are without any gharial or even any significant population of Chelonians. In the former stretch locations like Dhipri can be used for releasing gharial.

2. Along Rahu ka gaon to Pachhnada, 300 Km of Chambal and 15 Km of Yamuna, 415 gharial were counted with a mean density of 1.3 nos. per Km. The best stretch was between Basai Dang and Pureini with a concentration of 2.8 nos/Km and the lowest concentration (0.3/Km) was downstream Gyanpura - the last nesting site. Gyanpura population is subjected to maximum habitat pressure and deserves greater attention.

3. In the present count male:female ratio was 1:5, 36% in the size range upto 1.5 m were entirely wild-recruitments (from uncollected eggs) and 56% in the range 1.8-2.7m included natural population and individuals added throughtthe release programme. Indications are that the released gharial have hitherto contributed towards an increased trend of growth in population.

4. Adult males are always seen singly- the minimum distance between two was 5 Km. The group size of other size classes was 3-8 with a mean of 1.3-2.8 numbers per basking group. All nesting sites and 16 important basking zones are located close to nallahs and tributaries which the gharial use during monsoon. Therefore, it will be necessary to extend

contd....2....

the boundary of the sanctuary into such tributaries.

5. As expected, creche formation is the strongest in hatchlings. On only 12% times gharial below 0.6m were seen as solitary animals. The size class 2.4-2.7m appeared to be the most spaced-apart group with the maximum distance between two groups upto 40 Km. Stretches like 145-170 (Km. distance with reference to Pali) should be given better protection to attract size groups 2.4-2.7m and above because a future paucity of suitable 'adult areas' is anticipated.

6. From data on uncollected nests, it is deduced that upto 6.6% hatchlings may be surviving in the wild. These hatchlings have dispersed upto atleast 40 Km in the downstream.

RADIO-TRACKING (1.7-1.8m gharial)

7. Radio transmitters and other accessory equipments that were in use for alligator research in the U.S.A. were tested with gharial juveniles in the field and specifications for transmitters suitable for gharial have been determined:
Size: L x B x H x W: 8 x 2 x 2cm x 50-70g, antenna: perfectly flexible vertical 35 cm whip; insulation: acrylic - complete and strong; attachment: 4 nos. insulated composite wires; range: 5-7 Km; Life: 6 months; pulse rate: 70/min.; pulse width: Choice after meeting the above.

8. The most satisfactory mode of attachment of transmitter on gharial juveniles:- stitch it on the top of the tail at the double crested region.

9. Movement and habitat selection:

(a) Maximum distance moved by

(i) Gharial re-released 60 Km upstream of capture site -38 Km toward downstream in 6 months (Dec-June).

(ii) Wild gharial released 60 Km upstream of capture site - 14 Km toward downstream in 4 months (Dec.-Mar.)

(iii) Gharial re-released at the site of capture - 6 Km downstream in 15 days and 3 Km downstream in 20 days (June).

contd....3....

(b) Three relocated gharial moved toward the capture site in the downstream, and one gharial released at the site of capture was close to its usual 'residential site'.

(c) The maximum duration spent by any relocated gharial at one place: 3+ months.

(d) With the rise in water level up to 2m. the movement is either in the upstream or into an adjacent tributary.

(e) Relocated gharial move to join resident groups of similar-size gharial. Disturbances reflect immediately on the new-entrant and the latter moves away in search for a fresh group.

(f) Most long-range movements in relocated gharial occur during the night. A good record: 11 Km in the downstream overnight.

(h) Feeding hours: after 2-3 hours basking in the morning and again around and after sunset.

(g) Main period of activity: evening, after sunset 3-4 hours.

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*Results of a preliminary gharial census highlighting the trend of population growth.

**Designing a radio-tracking study suitable for gharial juveniles.

1990 17 mugger 215 Sharial

दुधुआ नेशनल पार्क – 8 मगर Dudhwa

कानपुर चिड़ियाघर – 16 कैमान Kanpur Zoo (Caiman)

दुधुआ नेशनल पार्क – 2 मगर – 3 घड़ियाल Dudhwa

मेरठ टीजन हस्तनापुर गंगा नदी में – 35 घड़ियाल

" " मोरघाट गंगा नदी में – 34 "

" " गढ़ मुक्तेश्वर गंगा नदी = 31 "

राम नगर – 25 घड़ियाल + 5 मगर Ram Nagar

कैमूर वन्यजीव विहार सोन नदी = 50 घड़ियाल

राष्ट्रीय चम्बल पशु विहार आगरा = 35 घड़ियाल Chambal

दुधुआ नेशनल पार्क – 2 घड़ियाल – 2 मगर Dudhwa

1991 कार्बेट नेशनल पार्क – 55 घड़ियाल – Corbett

कैमूर वन्यजीव विहार = 25 घड़ियाल

185 शारदा नदी = 50 घड़ियाल Sharda River

हस्तनापुर वन्यजीव विहार = 30 "

दुधुआ नेशनल पार्क किशनपुर (रे-पु) = 25 घड़ियाल Dudhwa

1883
215
185
2283 Gharial 51 mugger

	क्रम संख्या	वस्तु का विवरण	मात्रा	दर	धनराशि

U.P. Project

① Katerniaghat Sanctuary

18 km of river Girwa - created in 1976 - protects the breeding population of Gharials.

② Chambal National Gharial Sanctuary - UP + Rajasthan + M.P. management -