

EVALUATION OF MUGGER CROCODILE RESTOCKING BY MONITORING AND LONG-TERM MANAGEMENT IMPLICATIONS

V. Vijay Kumar

Introduction

Crocodile conservation project began in the country during the year 1975, with the objective of increasing the depleted crocodile population in the country. Several states took up this project using the strategy of collecting eggs in the wild, hatching them by eliminating the high risk of nest and hatching predation in the wild.

In the state of Andhra Pradesh historically the Indian Mugger Crocodile (Crocodylus palustris) and the Estuarine Crocodile (Crocodylus porosus) occurred. However, the saltwater crocodile became extinct in Andhra Pradesh by 1940s. Even the mugger crocodile was a highly depleted species by the mid 1970s. the state with two major rivers Krishna and Godavari and their numerous tributaries however had several suitable mugger habitats and also two mangrove areas in the Krishna and Godavari delta for the salt water crocodile.

Initiating the State Crocodile Conservation Project in 1976, to this date Andhra Pradesh have reintroduced 264 mugger crocodile in six different suitable mugger habitats in the state.

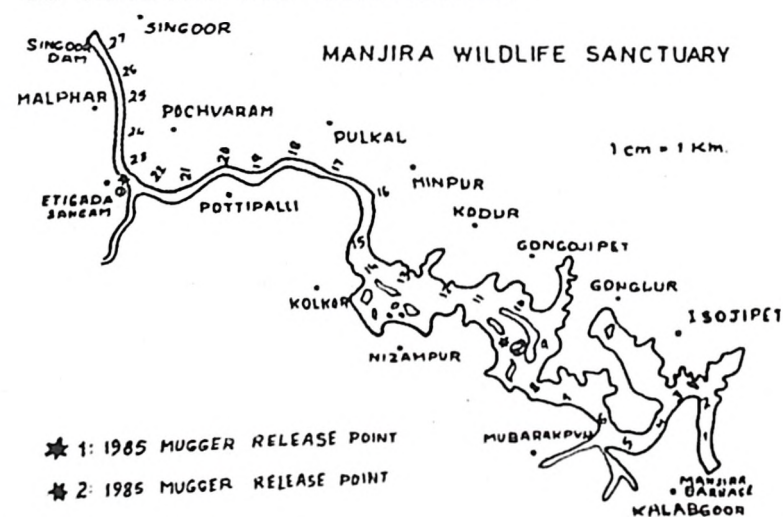
In all these locations, the A.P. Forest Department field personnels headed by a biologist were monitoring the released populations and their survival rate following release.

In 1984 the Wildlife Institute of India involved in this monitoring exercise through its centre at Hyderabad. With the suggestion of Crocodile Research Centre of the WII, the A.P. Forest Department stopped collection of wild laid eggs from the year 1984. From 1984 to 1986, the monitoring exercises expanded and covered activities of nesting success, dispersal of released stock, survival etc. and noted the decreasing sightings of introduced stock in some of the release locations.

In 1986, a full scale research project on monitoring of reintroduced crocodile was initiated and the work began in January, 1987, concentrating in three out of six reintroduction sites.

Study Area

The study area selected were distinctly different in nature as far as habitat was concerned.



1. Manjira Wildlife Sanctuary: The intensive study area was a reservoir, on the river Manjira a tributary to Krishna river. This location being a reservoir provided no opportunity for the reintroduced crocodiles to migrate downstream. However, since the initiation of this research project and now, one more dam has come across the river Manjira making the study area a closed water body.

2. Ethipothalla Wildlife Sanctuary: The second study area located on the Eastern boundary of Nagarjuna Sagar Srisailam sanctuary, below a 70 feet water falls on the Chandravanka, tributary of Krishna river. Here the introduced muggers had the opportunity of going downstream into the Krishna river - 3 Kms downstream of release point below the falls.

3. Siwaram Wildlife Sanctuary: The third study area was a open stretch on the river Godavari. Here the released mugger had the option to move both downstream and upstream.

Mugger Population in Each Area at the Beginning of The Study:

	Manjira			Ethipothalla			Siwaram		
	AD	SA	JU	AD	SA	JU	AD	SA	JU
Known Natural Population (From A.P.Forest Dept. Survey Reports)	7	5					7	5	
No. Introduced	10 (1985)			8 (1977-78)			7		8 (1985)
Total Population During 1985	7	5	10	8			7	12	8

In Manjira, at the beginning of my study period that is September, 1986 the total population of mugger was

estimated to be 7 adult, 5 sub-adult and 10 juveniles.

In Ethipothalla, where all mugger were introduced as sub-adults during 1977-78, have commenced breeding since 1981 were adults at the beginning of this study.

At Siwaram, assuming that no mortality or dispersal took place the population would have been 7 adults, 12 sub-adults and 8 juveniles.

So in all the study areas all size class muggers were expected to be present.

Population Trend

Even though population surveys were conducted both in winter and summer, data for maximum sightings during any particular summer count are given here. No data for hatchlings are included here. Summer survey reports for 1987, 1988, 1989 are given here.

Year	Manjira			Ethipothalla			Siwaram		
	AD	SA	JU	AD	SA	JU	AD	SA	JU
1987	7	3	1	6	2	2	7	1	1
1988	7	3	0	6	2	1	6	1	0
1989	7	2	3	5	3	1	6	3	1

Except for Ethipothalla, where sub-adult and juveniles size-classes have appeared in the population, in Manjira and Siwaram they show a decline. However, the adult population appears to be stable both in Manjira and Siwaram. the absence of juveniles and sub-adult size-classes in Manjira sanctuary made me survey the upstream areas of Manjira river, where earlier surveys have not reported major populations. In a survey of 32 Kms upstream of the release of Manjira indicated the following:

Upstream (Singor) Survey Reports

Year	Hatchlings	Juveniles	Sub-Adults	Adults
1987	3	2	4	9
1989	11		1	11

At E.P. falls, sightings of six adults in both the 1987 and 1988 appearance of sub-adults and juveniles did not call for checking of downstream. However, the summer 1989 results now necessitates a check on the downstream. The sub-adults and juveniles population in E.P. falls though small indicates an increase in the population.

In Siwaram, the population tends to be decreasing even though successful hatching of 3 nests have been confirmed every year.

Conclusion

From the results, it can be said why the resident adult size-classes have remained constant and are breeding successfully where as the re-introduced sub-adults and juveniles tend to have migrated. In the study area Ethipothalla, even though the sub-adults have an option of moving downstream they have remained close to the release point perhaps due to the absence of resident territorial adults. At Manjira, the re-introduced populations are believed to have migrated upstream as reflected in the survey reports of the upstream population.

At Siwaram also the re-introduced stock are not being observed. It is not known whether they have migrated towards downstream or upstream.

However, as an experiment six fluorescent colour painted juveniles and sub-adult muggers were released into Manjira in may, 1989 and intensively monitored every alternative night. Five of these have moved 4.5 kms. upstream from the release point even after facing an early monsoon flood. The smallest individual (80 cm.) has been recorded downstream 6 kms. from the release point.

It is intended to monitor these six muggers for another six months at the main study area with attempts to capture some individuals upstream to confirm whether these individuals are the released ones at Manjira, it is also planned to carry out survey both upstream and downstream of Siwaram to confirm the migration of re-introduced stocks.

