

THE INDIAN STAR TORTOISE *Geochelone elegans* - STATUS IN THE PROTECTED AREAS OF GUJARAT AND IN INDIAN ZOOS

Raju Vyas

Sayaji Baug Zoo, Vadodara, Gujarat 390018, India
Email: razoovyas@hotmail.com

ABSTRACT

The Indian Star Tortoise *Geochelone elegans* is under severe pressure due to threats to habitat, population and from national and international threats. The species is assessed as Vulnerable in both India and Sri Lanka, yet manages no high protection in the legislation of the country. The paper also highlights the need for a better role of zoos in India for the conservation of the species.

KEYWORDS

Geochelone elegans, habitat, Star Tortoise, status, trade, zoos

The stunning Indian Star Tortoise *Geochelone elegans* with the radiating 'star' pattern on its carapace is a very attractive animal. The tortoise is found in many zoos of the world and is one of the most favourite of private pet collectors and hobbyists the world over. At present it is the only tortoise species, which is in enormous demand in local, national and international pet trade markets, a fact substantiated by large collections and smuggling out of India and Sri Lanka (Katwal, 1998; Vyas & Parasharya, 2000; Walker, 2002a,b).

The species ranges over large parts of the Indian subcontinent in India (from Thar Desert of Pakistan to Rajasthan, Gujarat, Karnataka, Andhra Pradesh, Orissa, Tamil Nadu, Madhya Pradesh and Kerala) and in Sri Lanka. At least three geographically separate variants are differentiated and there is a distinct possibility that the species will be eventually divided into several subspecies (Das, 1995; Jayson, 1993). The main land population has been recognised by two separate populations. Star tortoises from the northern parts of the Indian subcontinent are large and have a relatively dark ground colouration. Animals from the southern parts are smaller with a more intense and contrasting pattern (Frazier, 1992). Sri Lankan specimens look much like the animals of the southern "type", but grow much larger and have more yellow tinge in their carapacial radiating lines than the Indian variants.

The Indian population was assessed as Vulnerable at the 1997 BCPP Conservation Assessment and Management Plan (CAMP) Workshop according to the 1994 IUCN Red List Criteria (Molur & Walker, 1998), on the basis of observed population reduction due to the decline in extent of occurrence, area of occupancy, quality of habitat and actual or potential levels of exploitation. By the same principle, the Sri Lankan population was also assessed as Vulnerable in 1998 by another CAMP workshop held in Sri Lanka on the country's herpetofauna (de Silva *et al.*, 2000). Currently, the Indian Star Tortoise is under Schedule IV of the Wildlife (Protection) Act 1972, which means that the protection accorded to it is less than those listed under Schedules I and II. The species is listed under Appendix II of

CITES, which permits trade under certain circumstances.

METHODOLOGY

A rapid inventory of the tortoise and its habitat assessment was done in a few protected areas (PAs) of Gujarat state during 2001-2003: (i) All ten PAs were visited and some of the most potential habitats of the species were explored for presence of the species; (ii) Secondary information about availability of the species was gathered from local people of the surrounding villages (especially Koli and Waghari tribes), forest personnel and wildlife enthusiasts; and (iii) A rapid survey in local pet markets was done by interviewing the pet traders and their net workers.

RESULTS

Out of the ten protected areas surveyed, reliable information regarding the presence of the species was gathered only from the eight protected areas (Table 1). The absence of the species was reported in two protected areas of Velavadar National Park and Jambughoda Wildlife Sanctuary, but presence of the species was informed out side within the distance of 25-30km from the PA boundaries. Some threats to the habitat of the species were observed in these PAs -- habitat loss, fragmentation and land encroachment. One of the major problem in these PAs is the growth of invasive plant species like Babul *Prosopis juliflora*.

Pet trade and animals dealers

A rapid survey of pet animal dealers was made in Ahmedabad, Surat, Vadodara and Bhavnagar cities (Table 2) according to whom there is high to moderate (20 to 2 per month) demand for Star Tortoises and other turtles from pet buyers. There is a predicted increase in demand of tortoises and turtles due to increasing interest in imported concepts of 'Feng Shui' and a new trend of keeping pet animals at homes.

I have personally interviewed a few pet animal dealers and laboratory animal suppliers in the state and outside. According to an animal dealer of 'Mir Sikar Tola' of Patna, the Indian Star Tortoise is in high demand in the Indian pet markets. This animal merchant regularly visits many northern Indian zoos and is one of the leading traders of Indian wild animals. The dealer had come to me for gathering information regarding hobbyists and private tortoise breeders of the state. He knew about the published reports of the species (Vyas & Parasharya, 2000). According to the dealer, due to the high value and demand of the species some animal traders in India collect small-sized tortoises and smuggle them in vegetable bags or parcels of day

Table 1. Status of Indian Star Tortoise (*Geochelone elegans*) and threats recorded in the protected areas of Gujarat

No	Name of the Protected Area	Area of the PA (sq. km)	Present/Absent (no of specimens examine)	Numbers of threats are recorded at different Protected Areas. (according size of threats)
North Gujarat				
1	Balaram-Ambaji Wildlife Sanctuary	542.08	Present (2)	Habitat loss, Fragmentation, Encroachments and Growth of invasive plants
2	Jassore Sloth Bear Sanctuary	180.66	Present (0)	Growth of invasive plants, Encroachments, Habitat loss and Fragmentation
Central Gujarat				
3	Jambughoda Wildlife Sanctuary	130.38	Absent (0)	Fragmentation, Encroachments, Habitat loss, Tourism and Management
Saurashtra				
4	Barda Wildlife Sanctuary	192.31	Present (2)	Encroachments, Habitat loss, Growth of invasive plants, Tourism and Mining.
5	Gir National Park and Sanctuary	1412.13	Present (2)	Encroachments, Habitat loss, Growth of invasive plants, Tourism Forest fire, Mining and Management
6	Hingolghadh Nature Education Sanctuary	6.54	Present (1)	Growth of invasive plants species
7	Rampara Wildlife Sanctuary	15.01	Present (0)	Encroachments, Growth of invasive plants and Habitat loss
8	Velavadar National Park	38.08	Absent (0)	Fragmentation, Encroachments, Habitat loss, Growth of invasive plant species and Indirect impact of developments
9	Gaga Bustard Sanctuary	3.33	Present (0)	Habitat loss, Growth of invasive plants and Grazing
Kachchh				
10	Narayan Sarovar Chinkara Sanctuary	444.23	Present (2)	Fragmentation, Encroachments, Habitat loss, Grazing, Tourism, Mining and Management

to day commodities. These traders cross the Indo-Nepal border on foot with such parcels and hand them over to the high rank traders of Nepal.

Indian zoos and the Star Tortoise

As per the document of 'Indian Zoo Inventory of 2002-2003' of Central Zoo Authority, Government of India, Delhi, 164 captive wild animals facilities exist in India. Out of these 26 captive facilities have the Indian Star Tortoise (Table 3); a total of 546 Star Tortoises. Ten zoos have the species but they do not know about the sex of the animals! And none have bred the animal in the last year. Other nine captive facilities have some tortoises but they do not know the species. Some zoos have kept tortoises in the cage labeled as 'Star Tortoise: *Testudo elegans*' but hold other species of tortoise (e.g. Trivandrum Zoo).

DISCUSSION

Present rapid habitat assessment results show that the species is present in protected areas but its status is unsure because all these areas are under tremendous pressure and most are managed with the concept of conserving only mega-mammalian species instead of the entire biodiversity.

A large area of Narayan Sarovar Wildlife Sanctuary was denotified in 1993 (earlier area = 765.79km²; present area = 321.56km²; denotified area = 444.23km²), was one of the larger natural habitats of the Indian Star Tortoise in Gujarat after Gir National Park and Sanctuary.

The growth of invasive species like *Prosopis* sp. is observed all over the state including protected areas. Large areas of the Jessore Wildlife Sanctuary, Balaram-Ambaji Wildlife Sanctuary and Rampara Wildlife Sanctuary are now converted into Babul (*Prosopis juliflora*) forests (more than the 30%), which is not a favourable habitat for the species. *Prosopis* growth is observed in the Velavadar National Park and Narayan Sarovar Wildlife Sanctuary at a rate of 760 and 950ha/year, respectively (Gadhvi, 2003; Singh 2001; Tiwari, 1999; Vyas & Gadhvi, 2003).

According to the previous report of Vyas and Parasharya (2000) the species is widely distributed in 15 districts of the state including 11 protected areas. The status of the species was observed as common in four PAs and uncommon in remaining seven PAs. But in that survey most of the specimens of the species were recorded from agricultural fields, which is a secondary habitat of the species.

Habitat alteration and destruction are the main threats to the species in the state. The PAs are limited and distributed far apart. Even PAs are prone to fragmentation or alteration (monoculture practices). Certain management practices of the PAs have adverse effects on the species (e.g. fire line, wall construction to demarcate area, elevated roads, vehicular traffic and railway line which prevents free movement of animals and often leads to accidental deaths).

Also recent developments in the state like 'Narmada canals' network will have definite negative impact on the population of

Table 2. Survey of pet markets and demands of turtles in Gujarat state

No.	Name of city	No. of Dealers	Demands of turtles in markets (Monthly)
1	Ahmedabad	5	20-5
2	Surat	3	4-2
3	Vadodara	5	8-6
4	Bhavnagar	2	8-6

Table 3. List of Indian zoos* that maintain captive populations of the Indian Star Tortoise.

No	Name of the zoo	M	F	U	T
1	Gwalior Zoo, Gwalior	2	3	0	05
2	Sakkarbaug Zoo, Junagadh	4	9	5	18
3	Sayaji Baug Zoo, Vadodara	4	7	29	40
4	N.C. Chaudhari, Pune	3	4	3	10
5	Rajiv Gandhi Zoo, WRC, Maharashtra	7	12	0	19
6	Ranibaug Zoo, Mumbai	2	3	0	05
7	Indira Gandhi Zoo, Visakhapatnam	7	22	0	29
8	Nehru Park Zoo, Hyderabad	6	4	0	10
9	Bannerghata Zoo, Bannerghatta	7	9	0	16
10	Lion & Tiger Safari, Shimoga	1	0	0	01
11	Vandalur Zoo, Chennai	3	3	110	116
12	Nandankanan Zoo, Bhubaneswar	2	3	0	05
13	Marble Palace Zoo, Kolkata	1	1	0	02
14	Assam Zoo, Guwahati	1	0	0	01
15	Rajkot Municipal Zoo, Rajkot	7	3	5	15
16	Mahatma Gandhi Zoo, Solapur	2	2	2	06
17	Indroda Deer Park, Gandhinagar	0	0	7	07
18	Kankariya Zoo, Ahmedabad	0	0	36	36
19	Sundarvan, Ahmedabad	0	0	48	48
20	Udaipur Zoo, Udaipur	0	0	10	10
21	Tirupati Zoo, Tirupati	0	0	82	82
22	Chamarajendra Zoo, Mysore	0	0	05	05
23	Chennai Snake Park, Chennai	0	0	13	13
24	V. O. C. Mini Zoo, Coimbatore	0	0	06	06
25	Alipur Zoo, Kolkata	0	0	38	38
26	Bellary Zoo, Karnataka	0	0	03	03
Total		59	85	402	546

M - Male; F - Female; U - Unidentified; T - Total

*Source: Indian Zoo Inventory of 2002-2003 by Central Zoo Authority, GOI, Delhi.

Star Tortoises in the future. The main canal of the Narmada Project passes through the state (including the Wild Ass Sanctuary), which has fragmented the habitat. Also intensive irrigation would change the present agricultural practices of the area. The anthropogenic pressure on the PAs, degradation of the habitat of the particular species and present scenario of the development in the state ratifies the earlier warning of Rao and Choudhury (1996) that "Gujarat appears to be one of the last strong hold of Star Tortoise in the country. However, the degradation of wildlife habitat in Gujarat in general and Star Tortoise habitat in particular may perhaps warrant immediate action rather than long-term planning for species conservation".

The recent news of about 4000 Star Tortoises seized in Singapore of very young size class (about 3 to 5cm-sized tortoises) (Walker, 2002a) definitely match with the described network of illegal smuggling of the species by those dealers of 'Mir Sikar Tola' of Patna, Bihar. The seizure may be just one while many consignments could have gone unnoticed.

The information of the captive *G. elegans* in Indian zoos from the document of Central Zoo Authority 'Indian Zoo Inventory of 2002-2003' is a sad reflection of the state of affairs of zoos as conservation organisations. This begs us to think again about our present policies of record keeping, taxonomy and conservation breeding role of the zoos in India. Some questions that nag are: Why hasn't any zoo bred such tortoises systematically? Why have they not mentioned particulars about the sex of the stock? Don't they have the basic knowledge of sexing these tortoises? Why do some zoos record them as unidentified species in that inventory?

Finally, there is an urgent need for a national level workshop on the conservation, taxonomy, husbandry and management practices of Indian testudines for the Indian zoo community.

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