

Chapter 11

The Status of North-Western Population of Star Tortoise (*Geochelone elegans*)

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Introduction

The star tortoise (=IST) (*Geochelone elegans*) is a medium sized, herbivorous terrestrial diurnal tortoise belonging to family Testudinidae, and is widely distributed over large parts of the Indian subcontinent (Plate 11 A).

The species is distributed in the dry regions of south-eastern and southern India, north-western India, Sri Lanka and extreme south-east Pakistan (Daniel 1983; Iverson and College 1992; Jayson 1993). It is primarily found in dry deciduous to scrub forests and grasslands to coastal scrublands of arid and semi-arid regions (Daniel 1983; Das 1995).

Legal Status of Species

Currently star tortoise is legally protected under the Schedule IV of the Wildlife (Protection) Act 1972 (amendments 2005) and internationally considered as Appendix II in CITES. The Indian population was assessed "Vulnerable" at the 1997 BCPP Conservation Assessment and Management Plan (CAMP) Workshop according to 1994 IUCN Red List Criteria (Molur and Walker 1998). Asian Turtle Trade Working Group (2000) assesses the species as globally "Lower Risk/Least Concerns" in the Red Data List, IUCN. Such status is explained at lowest value for the conservation.

Geographical Distribution

The geographical distributional pattern of species clearly illustrates that the species is discretely distributed in three sub-populations, i.e., two separate populations on main land and third on the island of Sri Lanka (Plate 11 D).

The main land population has been recognized by two separate populations. The animals from the Northern parts of the Indian subcontinent are large and have relatively dark ground coloration. Whereas the animals from the southern parts are smaller with a more intense and contrasting pattern (Frazier 1992). And third population from Sri Lankan specimens looks quite alike the animals of the Southern "type", but grows much larger and has more yellow tinge in their carapacial radiating lines than the Indian variants (De Silva 2003).

Presently, taxonomists consider all the sub-population as one species *Geochelone elegans*. But various sources of information suggest that this species occurs in three sub-populations i.e. 1) North-western, 2) Eastern-southern, and 3) Sri Lankan populations are morphologically recognizable forms and possibly taxonomically distinct (Choudhury and Bhupathy 1993). The three geographically separated populations are phenotypically different and there is a possibility that this species could consist of several subspecies.

Distribution of the North-Western Population

Literatures suggest that the north-western population of the star tortoise is confined between the western limit being Nagar Parkar of Thar Desert in Pakistan and the eastern limit being Sariska Wildlife Sanctuary, in Rajasthan, India. The southern limit lies north to Pavagadh Hills of Panchmahal District, Gujarat. There is only a single published report of the species from Mandasapur District, Madhya Pradesh. This habitat pocket is situated in between Chambal River and the adjoining state Rajasthan. Also, a report of the species from Sailana Wildlife Sanctuary exists, but it needs confirmation.

Habitat

A total of 31 Protected Areas come under the entire distributional range of the north-western population of star tortoise. These PAs are: one in Sindh Province, Pakistan and 30 in three states of India (Rajasthan-14, Gujarat-15 and Madhya Pradesh-1). This PA network specifies that total 20,186.74 km² of area is legally protected. These PAs have habitats crucial for the species (Table-1).

**Table-1: The list of Protected Areas falling under the distributional range of North-western population of star tortoise (*Geochelone elegans*).**

In last few decades, various surveys of the north-west population of the star tortoise, covering 22 PAs revealed that the species is present in 8 and 11 PAs of Rajasthan and Gujarat, respectively. The status of species from each PA is given in Table-2.

Table-2: The list of surveyed Protection Areas from the entire distributional range of north- western population of star tortoise (*Geochelone elegans*).

Sr. No.	Name of the Protected Area.	Area Sq. km	Total area of PA Habitat in each region
	Pakistan, Sindh Province		
1	Rann of Kutch Wildlife Sanctuary	3204.63	3205.00
	India, Rajasthan State		
2	Ranthambore National Park	392.00	
3	Sariska National Park and Wildlife Sanctuary	765.80	
4	Ramgarh Vishdhari Wildlife Sanctuary	301.00	
5	Jaisamnd Wildlife Sanctuary	52.00	
6	Bassi Wildlife Sanctuary	152.90	
7	Bhensrodgarh Wildlife Sanctuary	229.14	
8	Kumbhalgarh Wildlife Sanctuary	578.25	
9	Jamwa Ramgarh Wildlife Sanctuary	300.00	
10	Nahargarh Wildlife Sanctuary	50.00	
11	Sajjanganrh Wildlife Sanctuary	5.19	
12	Phulwari ki Nal WS	511.41	
13	Mount Abu Wildlife Sanctuary	288.84	
14	Sitamata Wildlife Sanctuary	422.94	
15	Tadgarth Raoli Wildlife Sanctuary	495.27	4544.74
	India, Gujarat State		
16	Gir National Park and Wildlife Sanctuary	1412.13	
17	Balaram-Ambaji Wildlife Sanctuary	542.08	
18	Jessore Sloth bear Wildlife Sanctuary	180.66	
19	Barada Wildlife Sanctuary	192.31	
20	Hingolghadh Wildlife Sanctuary	6.54	
21	Pania Wildlife Sanctuary	39.63	
22	Rampara Wildlife Sanctuary	15.01	
23	Velavadar National Park	34.08	
24	Gaga Bustard Wildlife Sanctuary	3.33	
25	Wild Ass Wildlife Sanctuary	4953.70	
26	Lalaji Bustard Wildlife Sanctuary	2.03	
27	Narayan Sarovar WS	444.23	
28	Kachchh Desert Wildlife Sanctuary	7506.22	
29	Mitiyala WS	18.22	
30	Girnar WS	178.87	15529.04
	India, Madhya Pradesh		
31	Sailana Wildlife Sanctuary	12.96	12.96
	Total Area		20186.74

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Table-2: The list of surveyed Protection Areas from the entire distributional range of north- western population of star tortoise (*Geochelone elegans*).

No	Protected Area	Status of Species	Area of PAs (Sq. km)	Source
INDIA				
Rajasthan				
1	Ranthambore NP	Rare	392.00	Sunni Patil (Personal Communication)
2	Sariska NP and WS	Reported	765.80	Biswas and Sanyal, 1977
3	Kumbhalgarh WS	Rare	578.25	Gaur and Pandey, 2007
4	Jamwa Ramgarh WS	Rare	300.00	Sharma, 1998
5	Nahargarh WS	Rare	50.00	Sharma, 2000
6	Sajjangarh WS	Rare	5.19	Sharma, 1999
7	Phulwari ki Nal WS	Reported	511.41	Sharma, 2001
8	Mount Abu WS	Rare	288.84	Sunni Patil (Personal Communication)
Gujarat				
9	Gir NP and WS	Common	1412.13	Frazier, 1988; Bhatt <i>et al.</i> 1998 Vyas, 2000a, 2000b and 2001
10	Balaram-Ambaji WS	Common	542.08	Vyas and Parasharya, 2000
11	Jessore Sloth bear WS	Common	180.66	Vyas and Parasharya, 2000; Vyas, 2005
12	Barada WS	Uncommon	192.31	Bhalodia <i>et al.</i> , 2001b
13	Hingolgadh WS	Uncommon	6.54	Vyas, 2000c
14	Pania WS	Uncommon	39.63	Vyas and Parasharya, 2000
15	Rampara WS	Uncommon	15.01	Bhalodia <i>et al.</i> , 2001
16	Velavadar NP	Not Reported	34.08	Vyas and Gadhvi, 2003
17	Gaga Bustard WS	Uncommon	3.33	Vyas and Parasharya, 2000
18	Wild Ass WS	Uncommon	4953.70	Vyas and Parasharya, 2000
19	Lalaji Bustard WS	Uncommon	2.03	Vyas and Parasharya, 2000
20	Narayan Sarovar WS	Uncommon	444.23	Vyas, 2002
21	Kachchh Desert WS	Not Reported	7506.22	Vyas, 2007
Madhya Pradesh				
22	Sailana W S	Reported	12.96	R. Sankaran (Personal Communication)

Non-PAs and Habitat Status

Anderson and Minton (1963) reported star tortoise from Nagar Parkar, Thar Desert of Pakistan as most western limit of the species, after which there was no subsequent information regarding the species. Nagar Parkar is a very large habitat area of dry arid and thorny scrub pockets on the north border of Great Rann of Kutchh. The status of star tortoise in this area is indeterminant but it is likely that the species is found in this area.



The star tortoise is reported from many sites outside protected areas of Rajasthan, Gujarat and small portions of Madhya Pradesh too (Table-3). The survey results of Frazier (1987), Das (1995), Vyas and Parasharya (2000) and Vyas (2006) state that the species is largely distributed in 12 districts of Rajasthan and 16 districts of Gujarat, especially agricultural, scrubs, thorny scrubs, arid and grass land habitat. Over all these are the very large habitats for the species, where a sizeable population of the species might inhabit.

Vyas and Singh (2004) reported the species from Madhya Pradesh near the Gandhi-Sagar reservoir at Mandasapur District. This habitat is comprised of scrub vegetation (Plate 11 B and 11C). It is the only remaining habitats for the species because such habitats were submerged during the construction of the dam. The area occupied by the star tortoise outside PAs is majority of the area where the north western population is distributed.

Table-3: The list of district wise location habitat area (non- Protected Area) of north-western population of Star tortoise (*Geochelone elegans*).

No	Country / Region / District (Location)	Reference/ Source
	PAKISTAN, Sindh Province	
1	Nagar-Parkar, Thar Desert	Anderson and Minton, 1963
	INDIA , Rajasthan State	
1	Banswada	R. Vyas (Unpublished Observation)
2	Barmer (Mokalsar, Rakhi, Siwana)	Frazier, 1987
3	Bhilwara	Frazier, 1987
4	Chitorgarh	Frazier, 1987
5	Dungarpur	Frazier, 1987; Saxena, 2003
6	Jaipur	Frazier, 1987
7	Jalor (Erinpura, Bihar, Sanchor)	Frazier, 1987
8	Jodhpur (Bisalpur)	Frazier, 1987
9	Pali (Barr)	Frazier, 1987
10	Sawai Madhopur (vicinity Ranthabor NP)	Sunny Patil (Personal Communication)
11	Sirohi (Abu Road)	R. Vyas (Unpublished Observation)
12	Udaipur (vicinity Jaisamand WS, Kirat, Jhadol)	Frazier, 1987; Sharma, 2001; 2003 and 2004; Bhatnagar and Mathur, 2008
	INDIA, Gujarat State	
1	Ahemdabad (Koth, Sarkhej)	Vyas and Parasharya, 2000
2	Amreli (Dhari)	Vyas and Parasharya, 2000
3	Anand (Borsad)	Vyas and Parasharya, 2000
4	Banaskantha (Dhanera, Dantiwada, Iqubal Gadh, Palanpur, Rasarpur)	Vyas and Parasharya, 2000 Gayen, 1999
5	Bhavnagar (Sihor)	Vyas and Parasharya, 2000
6	Gandhinagar (Koba)	Vyas and Parasharya, 2000
7	Jamnagar (Lalpur)	Vyas and Parasharya, 2000
8	Junagadh (Satadhar)	Vyas and Parasharya, 2000
9	Kheda (Chakalasi, Isanpur, Kapadvanji)	Vyas and Parasharya, 2000
10	Katchh (Mundra, Mandvi)	R. Vyas (Unpublished Observation)
11	Mehsana (Becharaji, Vijapur)	Vyas and Parasharya, 2000
12	Panchmahal (Chapaner)	Vyas and Parasharya, 2000
13	Rajkot (Vankaner)	Vyas and Parasharya, 2000
14	Sabarkantha (Vatrak, Ider)	Vyas and Parasharya, 2000
15	Surendranagar (Dhangdhara, Wankaner)	Vyas and Parasharya, 2000
16	Vadodara (Savali, Timba)	R. Vyas (Unpublished Observation)
	INDIA , Madhya Pradesh	
1	Mandasapur (Gandhisagar Reservoir)	Vyas and Singh, 2004

Threats on the Sub-Population

Five major threats are recorded in the entire distributional range of the north-western population of star tortoise (Table-4). These threats are responsible for depletion of the population of the star tortoise in its range. Habitat destruction by fragmentation or alteration is among the important threats to the species. Population of the species inhabiting protected areas also experience threats. Some forestry practices are not compatible with the goal of sustaining a viable population of the species (Vyas 2006).

Pet trade is also one of the major threats for star tortoise populations. Large numbers of animals are illegally collected from their habitats, smuggled for local, national and international pet markets. This threat is not specific on the north-western population of star tortoise. It has been repeatedly documented that animals are collected from entire distributional range as a source of food (Moll 1989).

Table-4: The list of various recorded threats on north-western population of the Star Tortoise (*Geochelone elegans*).

No.	Type of threats	Size of threats
1	HABITAT DESTRUCTION -Fragmentation - Alteration - Habitat loss	High
2	AGRICULTURE PRACTICE -Pesticides, herbicides -Crop pattern -Protection devices for crop field -Irrigation canal network	High
3	FOREST MANAGEMENT -Fire line practice -Management plan on basis of only bigger or single species conservation guidelines, uncovered entire biodiversity	Moderate
4	-Interior blocks and boundary demarcations with concrete wall -Plantation works -Collection of grasses, grazing by livestock	
4	PET TRADE - loss of gene pool	High
5	DEVELOPMENTAL ACTIVITIES - Expanding Road network - Expanding Railway network - Urbanization - Irrigation Canal Network	Moderate



Conclusion

The assessment of the north-western population of star tortoise reveals that a significant population of the species occurs outside PAs and it needs special measures for conservation. Research targeting the ecology, reproductive biology, ex-situ needs and population assessments will help in developing species recovery plans.

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Plate 11



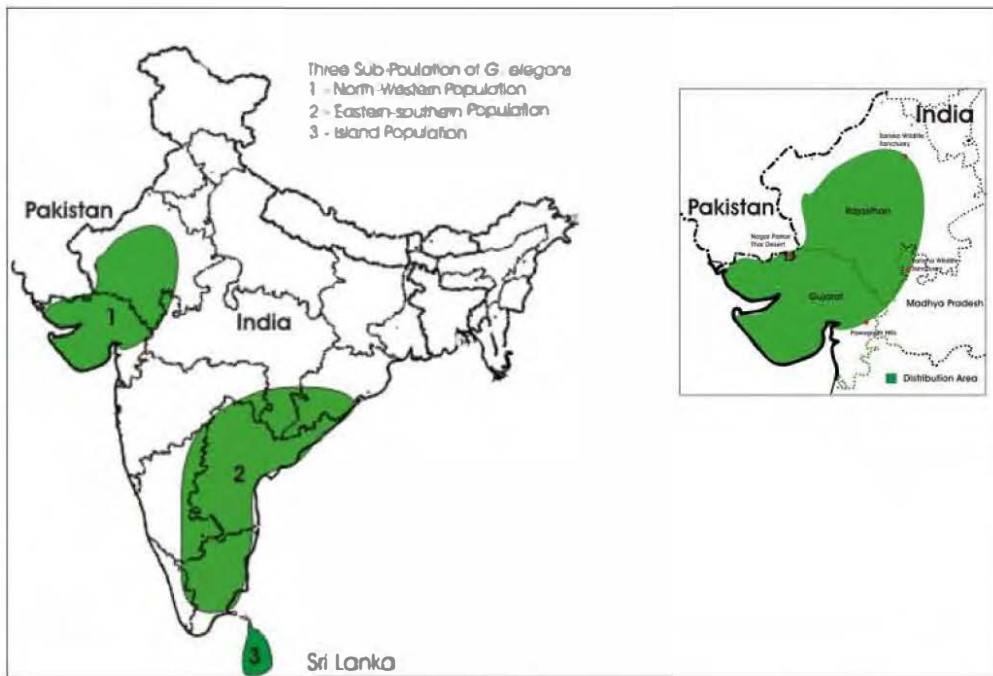
(A)



(B)



(C)



(D)

(A): Hatchling of Indian Star Tortoise; (B): Thorny-scrub forest areas near Pakistan border, Kutch Desert Wildlife Sanctuary; (C): A typical habitat of Indian Star Tortoise, Near Sihor, Bhavanagar District, Gujarat and (D): The Geographical Distribution of North-Western Population of Indian Star Tortoise *Geochelone elegans*