

# Tortoises and Freshwater Turtles of India



TRAFFIC, India Office
TURTLE SURVIVAL ALLIANCE (TSA)-India
WWF-India
2019







#### USING THE IDENTIFICATION (ID) CARDS

The Identification (ID) Cards: Tortoises and Freshwater Turtles of India, have been developed and produced by TRAFFIC, India office and Turtle Survival Alliance (TSA)-India, to help wildlife law enforcement agencies to identify various species of tortoises and freshwater turtles' in illegal wildlife trade. The ID cards provide quick reference to important information about the species in focus such as their legal and conservation status, distribution, identification features and key threats. Designed and printed as pocket-sized, easy to carry, they should come in handy during wildlife trade surveys and seizures

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> Published by TRAFFIC, India Office

Content: TSA-India: TRAFFIC, India Office

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Maps prepared by IGCMC, WWF-India

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#### INTRODUCTION:

'Testudines' or 'Chelonii' (turtles, terrapins and tortoises) is one group of reptiles that are covered with bony plates enclosing their soft body parts; the dorsal plate is known as the 'carapace' and ventral plate is known as the 'plastron'. The structural pattern of these plates is the key character for their identification. These two plates have undergone modification during evolution of this group about 200 million years ago and the structural pattern of these plates is the prime key character for identification of this group.

Turtles are further divided into 'marine turtles' and 'freshwater turtles' depending upon the habitat they live in. Twenty eight species of tortoises and freshwater turtles are found in India distributed across the country.

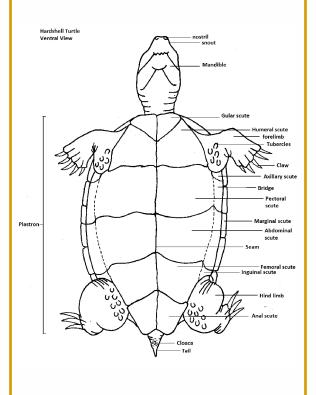
Leith's Softshell Turtle *Nilssonia leithii*, Cochin Forest Cane Turtle *Vijayachelys silvatica* and Travancore Tortoise *Indotestudo travancorica* are endemic to India.

#### $Key \, characters \, to \, differentiate \, between \, tortoises, turtles \, and \, terrapins: \,$

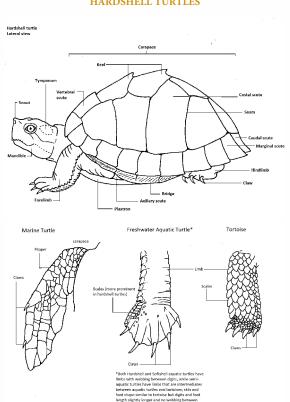
Character	Tortoise	Turtle	Terrapin
Habitat	Spends all its life on land.	Spends all its time in water and only comes to land to lay eggs.	Spends time both on land and in water along rivers, ponds and lakes.
Carapace	Dome shaped to protect it from predators.	Laterally compressed and streamlined for swimming.	Laterally compressed and streamlined.
Limbs	Feet are short with bend legs, digits non- webbed.	Forefeet modified as flippers hind feet webbed.	Webbed feet to assist in swimming.
Head	Completely retracts its head into the shell.	Cannot retract its head into the shell.	Can fold its head sideways.

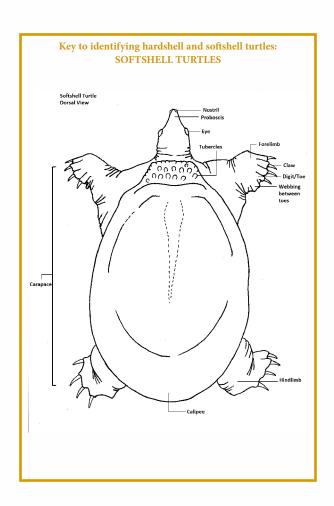
## Key to identifying hardshell and softshell turtles: HARDSHELL TURTLES Hardshell Turtle Dorsal View Webbing between Tubercles **Nuchal Scute** forelimb Digit/to Costal scutes Keels Carapace-- Ventral scute Marginal scute Caudal Scute

#### Key to identifying hardshell and softshell turtles: HARDSHELL TURTLES



#### Key to identifying hardshell and softshell turtles: HARDSHELL TURTLES





## Key to identifying hardshell and softshell turtles: SOFTSHELL TURTLES Softshell Turtle Ventral view Nostril Plastron-Callosities - Calipee

#### ILLEGAL TRADE IN TORTOISES AND FRESHWATER TURTLES OF INDIA:



@P.Tansom/TRAFFIC

The tortoises and turtles of India, especially the freshwater turtles face enormous threat from illegal wildlife trade. They are collected from the wild and traded in large numbers for both consumption within India and for smuggling to other countries as pets. They are poached for their meat that is consumed as a delicacy and their body parts are used in oriental medicines.

Like many other wildlife species, there is limited data available regarding their population status and trade, to estimate scientifically the effect of trade on species survival and conservation in the wild. While most of the illegal trade goes unreported, the large numbers that are reported in seizures indicate heavy levels of exploitation that may be unsustainable.

In India, most tortoise and turtle species are protected under the Wildlife (Protection) Act, 1972 and their international trade is further regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) to which India has been a signatory since 1976. Despite the legal framework to protect the species from exploitation, poaching and trade continues unabated. Recent seizures of tortoises and turtles in India have indicated worrisome trends. For example, there has been a huge demand for the Black Spotted Turtle and the Indian Star Tortoise in international markets.

Local consumption for meat within India has been a major domestic threat to tortoises and turtles giving rise to an immediate need to create more awareness among communities and civil society regarding conservation and protection of tortoises and turtles in India.

#### ASIATIC SOFTSHELL TURTLE Amyda cartilaginea



#### **CONSERVATION STATUS:**

Wildlife (Protection) Act of India: Not Listed CITES: Appendix II IUCN Redlist: Vulnerable

#### DISTRIBUTION:

Mizoram (Ngengpui Wildlife Sanctuary) and Tripura.

#### **IDENTIFICATION FEATURES:**

Long snout; a distinct row of tubercles along the front of the carapace; plastron with five callosities.

THREAT: Meat consumption in India; smuggled to other countries for it's meat and use in traditional Chinese medicines.



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**Identification Cards: Tortoises and Freshwater Turtles of India** 

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#### INDIAN NARROW-HEADED SOFTSHELL TURTLE Chitra indica



#### CONSERVATION STATUS:

Wildlife (Protection) Act of India: Schedule II CITES: Appendix II

IUCN Redlist: Endangered

#### DISTRIBUTION:

Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Uttarakhand, Uttar Pradesh, Tamil Nadu, Telangana and West Bengal occurring in Ganges, Godavari, Mahanadi and Sutlej Rivers.



#### **IDENTIFICATION FEATURES:**

Head extremely narrow with eyes situated close to the nostrils; a 'V' shaped mark commences from the nape and extends to the carapace.

THREAT: Meat consumption in India; calipee smuggled out for traditional Chinese medicine







### INDIAN SOFTSHELL TURTLE/GANGES SOFTSHELL TURTLE Nilssonia gangetica



#### CONSERVATION STATUS:

Wildlife (Protection) Act of India: Schedule I (Part II)

CITES: Appendix I IUCN Redlist: Vulnerable

#### DISTRIBUTION:

Assam, Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Madhya Pradesh, Meghalaya, Odisha, Punjab, Rajasthan, Uttar Pradesh. Uttarakhand and West Bengal.



### © Shailendra Singh

#### IDENTIFICATION FEATURES:

Carapace low, oval and grey black; head is green above with several black oblique stripes on the forehead and sides.

THREAT: Meat and egg consumption and harvesting for outer cartilaginous rim (calipee) used for medicinal purposes.



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#### INDIAN PEACOCK SOFTSHELL TURTLE Nilssonia hurum



#### CONSERVATION STATUS:

Wildlife (Protection) Act of India: Schedule I (Part II) CITES: Appendix I IUCN Redlist: Vulnerable

#### DISTRIBUTION:

Assam, Bihar, Jharkhand, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Odisha, Rajasthan, Tripura, Uttarakhand, Uttar Pradesh and West Bengal.



#### IDENTIFICATION FEATURES:

Carapace olive with a yellow rim of ocelli; head with black reticulation and large orange or yellow patches.

THREAT: Meat consumption; harvested for outer cartilaginous rim; (calipee) used for medicinal purposes.



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#### LEITH'S SOFTSHELL TURTLE Nilssonia leithii



#### **CONSERVATION STATUS:**

Wildlife (Protection) Act of India: Schedule IV CITES: Appendix II IUCN Redlist: Vulnerable

#### DISTRIBUTION:

Andhra Pradesh, Chhattisgarh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu and Telangana. It occurs in the Bhavani, Godaveri and Moyar Rivers of peninsular India (Moll and Vijava, 1986).



#### IDENTIFICATION FEATURES:

Wart like tubercles present on the anterior edge of carapace; head bears reddish-orange spot.

THREAT: Domestic meat consumption; calipee used in traditional Chinese medicine.







#### **BLACK SOFTSHELL TURTLE Nilssonia nigricans**



© Shailendra Singh

#### **CONSERVATION STATUS:**

Wildlife (Protection) Act of India: Not Listed CITES: Appendix I

IUCN Redlist: Extinct in the Wild

#### **DISTRIBUTION:**

Arunachal Pradesh, Assam, Meghalaya in the (Brahmaputra River in northeast India) and Nagaland.



#### **IDENTIFICATION FEATURES:**

Plastron is dark grey with blackish glitter; posterior two thirds of the upper lip is white.

THREAT: Fragmented wild populations; illegal collection of individuals from the wild for meat.



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#### INDIAN FLAPSHELL TURTLE Lissemys punctata



#### **CONSERVATION STATUS:**

Wildlife (Protection) Act of India:

Schedule I (Part II) CITES: Appendix II

IUCN Redlist: Lower Risk/Least Concern

#### DISTRIBUTION:

Assam, Andhra Pradesh, Bihar, Chhattisgarh, Goa, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Tamil Nadu, Telangana, Uttarakhand, Uttar Pradesh, West Bengal and introduced in Andaman Islands.



#### **IDENTIFICATION FEATURES:**

Shell can close completely; forelimbs and hindlimb can be retracted fully; olive green carapace with dark yellow blotches.

THREAT: Illegal trade for meat.







#### ASIAN GIANT SOFTSHELL TURTLE Pelochelys cantorii



© Nikhil Peraje

#### **CONSERVATION STATUS:**

Wildlife (Protection) Act of India: Schedule I (Part II) CITES: Appendix II IUCN Redlist: Endangered

#### DISTRIBUTION:

Kerala, Odisha, Tamil Nadu and West Bengal.

#### **IDENTIFICATION FEATURES:**

Proboscis extremely short; small flap of skin on the gular region; plastron is cream coloured.



THREAT: Poaching for meat and eggs.



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#### NORTHERN RIVER TERRAPIN Batagur baska



#### CONSERVATION STATUS:

Wildlife (Protection) Act of India: Schedule I (Part II)

CITES: Appendix I

IUCN Redlist: : Critically Endangered

#### **DISTRIBUTION:**

Sunderbans in West Bengal to historically inhabited estuarine habitats in Odisha.

#### **IDENTIFICATION FEATURES:**

Carapace domed and heavily buttressed;

snout upturned; carapace olive grey; head in male becomes bright crimson during courtship season (October)



© Shailendra Singh

 $THREAT: Targeted \ for \ meat; wild \ population \ severely \ decimated.$ 



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#### THREE-STRIPED ROOFED TURTLE Batagur dhongoka



#### **CONSERVATION STATUS:**

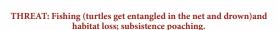
Wildlife (Protection) Act of India: Not Listed CITES: Appendix II IUCN Redlist: Endangered

#### DISTRIBUTION:

Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Uttar Pradesh, Rajasthan and West Bengal.

#### **IDENTIFICATION FEATURES:**

Three black stripes on the carapace; a yellow line across the head, above tympanum; plastron plain without any pattern season.





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#### **RED-CROWNED ROOFED TURTLE Batagur kachuga**



#### CONSERVATION STATUS:

Wildlife (Protection) Act of India: Schedule I (Part II)

CITES: Appendix II

IUCN Redlist: Critically Endangered

#### DISTRIBUTION:

Assam, Bihar, Chhattisgarh, Haryana, Jharkhand, Madhya Pradesh, Rajasthan, Uttarakhand, Uttar Pradesh and West Bengal.

# Species Bagget statement and the statement and t

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#### **IDENTIFICATION FEATURES:**

Carapace moderately elevated, oval and slightly flaring posteriorly; adult males have red and yellow stripes on blue-black head.

THREAT: Meat consumption; illegal pet trade.



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#### SOUTH ASIAN BOX TURTLE Cuora amboinensis



#### CONSERVATION STATUS:

Wildlife (Protection) Act of India: Not Listed CITES: Appendix II IUCN Redlist: Vulnerable

#### DISTRIBUTION:

Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Andaman and Nicobar Islands and Tripura.

#### © Shailendra Singh



#### **IDENTIFICATION FEATURES:**

A hinge across the middle of the plastron to close the shell completely; head dark brown or green above, yellow below, with three yellow or orangish-yellow bands.

THREAT: Meat consumption in India; smuggled for use in traditional Chinese medicines and illegal pet trade.



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#### **KEELED BOX TURTLE Cuora mouhotii**



#### **CONSERVATION STATUS:**

Wildlife (Protection) Act of India: Not Listed CITES: Appendix II IUCN Redlist: Endangered

#### DISTRIBUTION:

Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura.

#### **IDENTIFICATION FEATURES:**

Three prominent keels on the carapace; shell elongated; carapace markedly flat-topped; the marginals serrated posteriorly.



#### THREAT: Meat consumption.







**Identification Cards: Tortoises and Freshwater Turtles of India** 

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#### ASSAM LEAF TURTLE Cyclemys gemeli



#### **CONSERVATION STATUS:**

Wildlife (Protection) Act of India: Schedule I

(Part II) CITES: Appendix II

IUCN Redlist: Not Evaluated

#### DISTRIBUTION:

Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and West Bengal.

#### **IDENTIFICATION FEATURES:**

Carapace with dark radiating lines on each scute; colour is brown; a vertebral keel with two lateral keels.



© Rajeev Basumatary

THREAT: Meat consumption; illegal pet trade.



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#### **BLACK SPOTTED POND TURTLE Geoclemys hamiltonii**



© Arunima Singh

#### **CONSERVATION STATUS:**

Wildlife (Protection) Act of India: Schedule I (Part II)

CITES: Appendix I IUCN Redlist: Vulnerable

#### DISTRIBUTION:

DIST KIBU TION:
Arunachal Pradesh, Assam, Bihar, Haryana,
Himachal Pradesh, Jammu and Kashmir, Jharkhand,
Madhya Pradesh, Meghalaya, Punjab, Rajasthan,
Uttarakhand, Uttar Pradesh, and West Bengal.



#### **IDENTIFICATION FEATURES:**

Head black with yellow (or white) spots; forelimbs black with white spots; carapace elongated and distinctly convex in male.

THREAT: Heavily trafficked for pet trade; meat consumption.







#### CROWNED RIVER TURTLE Hardella thurjii



#### **CONSERVATION STATUS:**

Wildlife (Protection) Act of India: Not Listed CITES: Appendix II IUCN Redlist: Vulnerable

#### DISTRIBUTION:

Assam, Bihar, chhattisgarh, Jharkhand, Madhya Pradesh, Manipur, Meghalaya, Mizoram, Punjab, Rajasthan, Tripura, Uttar Pradesh and West Bengal.



### IDENTIFICATION FEATURES:

Four yellowish-orange stripes on both sides of the head and forehead; limb brownish with yellow edges; head large, snout projecting beyond the lower jaw.

THREAT: Accidental capture in fishing nets; meat consumption.



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#### TRICARINATE HILL TURTLE Melanochelys tricarinata



#### CONSERVATION STATUS:

Wildlife (Protection) Act of India: Schedule I (Part II)

CITES: Appendix I IUCN Redlist: Vulnerable

#### DISTRIBUTION:

Arunachal Pradesh, Assam, Bihar, Jharkhand, Manipur, Mizoram, Uttarakhand, Uttar Pradesh and West Bengal.

#### **IDENTIFICATION FEATURES:**

Carapace dark olive, grey-black or reddish brown with three pale yellow keels; digits half webbed; outer surface of forelimbs with enlarged scales.

THREAT: Meat consumption; illegal pet trade.



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#### INDIAN BLACK TURTLE Melanochelys trijuga



#### CONSERVATION STATUS:

Wildlife (Protection) Act of India: Not Listed CITES: Appendix II IUCN Redlist: Lower Risk/Near Threatened

#### **DISTRIBUTION:**

Andhra Pradesh, Assam, Bihar, Chhattisgarh, Goa, Gujarat, Haryana, Karnataka, Kerala, Maharashtra, Manipur, Mizoram, Odisha, Punjab, Tamil Nadu, Telangana, Tripura, Uttarakhand, Uttar Pradesh and West Bengal.



#### **IDENTIFICATION FEATURES:**

Carapace dark olive, grey -black or reddish brown with pale yellow keels; fingers half webbed; outer surface of forelimbs with enlarged scales.

THREAT: Meat consumption; illegal pet trade.



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#### **INDIAN EYED TURTLE Morenia petersi**



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#### CONSERVATION STATUS:

Wildlife (Protection) Act of India: Not Listed CITES: Appendix II IUCN Redlist: Vulnerable

#### DISTRIBUTION:

Arunachal Pradesh, Assam, Bihar, Meghalaya, Uttarakhand, Uttar Pradesh and West Bengal.



#### **IDENTIFICATION FEATURES:**

Plastron is yellow or orange with black blotches on the axillary scutes; head is olive with three yellow stripes on each side; limbs have yellow margins.

THREAT: Meat consumption.







#### BROWN ROOFED TURTLE Pangshura smithii



#### CONSERVATION STATUS:

Wildlife (Protection) Act of India: Not Listed CITES: Appendix II

IUCN Redlist: Lower Risk/Near Threatened

#### DISTRIBUTION:

Arunachal Pradesh, Assam, Bihar, Haryana, Himachal Pradesh, Jammu and Kashmir, Meghalaya, Nagaland, Punjab, Uttarakhand, Uttar Pradesh and West Bengal.

# © Arunima Singh

#### IDENTIFICATION FEATURES:

Carapace is brownish-olive with a dark brown vertebral stripe; plastron yellow with or without dark blotches on each scute.

THREAT: Meat consumption; males and juveniles collected for illegal pet trade.





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#### **ASSAM ROOFED TURTLE Pangshura sylhetensis**



© Rajeev Basumatry

#### **CONSERVATION STATUS:**

Wildlife (Protection) Act of India: Schedule I (Part II)

CITES: Appendix II IUCN Redlist: Endangered

DICTRIBUTION

#### **DISTRIBUTION:**

Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and West Bengal

# Species

#### **IDENTIFICATION FEATURES:**

Shell is highly elevated, oval and serrated posteriorly with pale brown vertebral keel; a narrow yellow stripe runs from the eyes to the middle of the back of the head.

THREAT: Illegal pet trade







#### INDIAN ROOFED TURTLE Pangshura tecta



#### CONSERVATION STATUS:

Wildlife (Protection) Act of India: Schedule I (Part II)

CITES: Appendix I

IUCN Redlist: Lower Risk/Least Concerned

#### DISTRIBUTION:

Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Madhya Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Punjab,

Rajasthan, Tripura, Uttarakhand, Uttar Pradesh and West Bengal.



#### **IDENTIFICATION FEATURES:**

Head with orange or reddish crescent shaped post ocular marking; curving up from below the eyes to meet at forehead; neck dark with thin yellow stripes.

THREAT: Illegal pet trade; egg consumption; use in traditional Chinese medicines.







#### **INDIAN TENT TURTLE Pangshura tentoria**



#### CONSERVATION STATUS:

Wildlife (Protection) Act of India: Not Listed CITES: Appendix II

IUCN Redlist: Lower Risk/Least Concerned

#### DISTRIBUTION:

Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Rajasthan, Telangana, Tripura, Uttar Pradesh, Uttarakhand and West Bengal.



© Rishika Dubla

#### IDENTIFICATION FEATURES:

Carapace is oval with distinct vertebral keel; carapace is brown in colour with an amber or hazel stripe along the first three vertebrae; the plastron is yellow with large black blotches; head is olive or brownish.

THREAT: Meat consumption; captured for pet trade.



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#### **COCHIN FOREST CANE TURTLE Vijayachelys silvatica**



#### CONSERVATION STATUS:

Wildlife (Protection) Act of India: Schedule I (Part II)

CITES: Appendix II IUCN Redlist: Endangered

#### **DISTRIBUTION:**

The turtle is endemic to the Western Ghats area of India. It is reported from the States of Karnataka, Kerala and Tamil Nadu



#### **IDENTIFICATION FEATURES:**

Small turtle with large head; carapace depressed; adult males are typically darker with scarlet iris, yellow to orange mandibles; forelimbs grey with olive-brown scales.

THREAT: Meat consumption; feral dogs in Western Ghats.



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#### **INDIAN STAR TORTOISE Geochelone elegans**



#### CONSERVATION STATUS:

Wildlife (Protection) Act of India: Schedule IV CITES: Appendix I IUCN Redlist: Vulnerable

#### **DISTRIBUTION:**

Andhra Pradesh, Chhattisgarh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Odisha, Rajasthan, Tamil Nadu and Telangana.



#### **IDENTIFICATION FEATURES:**

Both carapace and plastron are star marked with a pattern of dark brown or black or yellow or beige; shells domed dorsally with flattened sides.

THREAT: Illegal pet trade.



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#### TRAVANCORE TORTOISE Indotestudo travancorica



#### **CONSERVATION STATUS:**

Wildlife (Protection) Act of India: Schedule IV CITES: Appendix II IUCN Redlist: Vulnerable

#### DISTRIBUTION:

Karnataka, Kerala and Tamil Nadu. Endemic to Western Ghats

#### **IDENTIFICATION FEATURES:**

Shell olive or brownish, usually with black blotches on each scute of the plastron; limbs with yellowish scales and head yellowish brown.

THREAT: Meat consumption.







#### YELLOW TORTOISE/ ELONGATED TORTOISE Indotestudo elongata



CONSERVATION STATUS:

Wildlife (Protection) Act of India: Schedule IV CITES: Appendix II IUCN Redlist: Endangered

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DISTRIBUTION: Assam, Bihar, Jharkhand, Manipur, Meghalaya, Mizoram, Odisha, Tripura, Uttarakhand, Uttar Pradesh and West Bengal.

#### **IDENTIFICATION FEATURES:**

Carapace brownish yellow; each scute of both carapace and plastron frequently have black blotches; head pale yellow; pink colouration during breeding season around the nostrils and eyes.

THREAT: Meat consumption in India and other South Asian countries; smuggled for use in traditional Chinese medicines.









#### **ASIAN GIANT TORTOISE Manouria emys**



© Shailendra Singh

#### **CONSERVATION STATUS:**

Wildlife (Protection) Act of India: Schedule IV CITES: Appendix II IUCN Redlist: Endangered

#### DISTRIBUTION:

Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura.



#### **IDENTIFICATION FEATURES:**

Shell is blackish brown; forelimbs have large overlapping scales; a large pointed tubercle is on the thighs; tail terminating in a horny scale.

THREAT: Meat consumption; illegal pet trade.



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#### GLOSSARY:

Abdominal scutes: fourth pair of scutes on plastron below pectoral scutes

**Anal scutes:** sixth and last pair of scutes below femoral scutes near tail in posterior of plastron

Axillary scute: scute on the anterior of the bridge

Bridge: part of shell connecting carapace to plastron

**Calipee:** shell cartilage in softshell turtles running from the midsection to the posterior of the body

Callosity: a hardened area of skin, occasionally with sculptured bone exposed

Carapace: dorsal shell of a turtle

Caudal scutes: last two scutes in posterior of carapace above tail area

**Cloaca:** common opening for excretion of waste products and for the sex organs

Costal scute: two sets of four scutes on either side of vertebral scutes

Digit: finger or a toe

Femoral scutes: fifth pair of scutes below abdominal scutes

Gular scute: pair of anterior most scutes on plastron

Humeral scute: second pair of scutes on plastron below gular scutes

Inguinal scute: scute on the posterior of the bridge

Keel: a narrow prominent ridge

Marginal scutes: ring of two sets of 11 scutes running along edge of carapace, starting from nuchal scute and ending at caudal scutes

Nuchal scute: top most scute on the anterior of the carapace directly behind the head

Ocelli: dark circular markings on carapace; also 'eyes'

Pectoral scutes: third pair of scutes on plastron below humeral scutes

Plastron: the ventral shell of a turtle

#### **GLOSSARY:**

Proboscis: elongated snout-like projection from front of head

Scute: a horny epidermal shell

Seam: a line of contact between two scutes

Tubercle: a knot-like projection

**Tympanum:** air filled hearing structure behind the eye or 'upper cheek' of animals; plastron plain without marking

Vertebral scute: column of five scutes running down the middle of carapace from the head towards the tail



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**Turtle Survival Alliance (TSA):** TSA was formed in 2001 as an IUCN partnership for sustainable captive management of freshwater turtles and tortoises, as a response to the rampant and unsustainable harvest of Asian turtle populations to supply to Chinese markets, a situation known as the Asian Turtle Crisis. TSA works with zoos, aquariums, universities, private turtle breeders, veterinarians, government agencies, and conservation organizations around the world. To know more, please visit **www.turtlesurvival.org**.

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