

TARGET PRELIMS 2024

BOOKLET-18; EB&CC-8

BIODIVERSITY-IMPORTANT SPECIES

1. TABLE OF CONTENTS

1. <i>Table of Contents</i>	0
2. <i>Report: The State of India's Birds 2023 (Report published in AuG 2023)</i>	3
3. <i>Report: 75 Endemic Birds of India</i>	5
4. <i>Critically Endangered Birds in India</i>	7
1) The Jerdon's Courser (<i>Rhinoptilus bitorquatus</i>)	7
2) Bugun Liocichla	7
3) The White Bellied Heron (<i>Ardea insignis</i>) (imperial heron) (great white-bellied heron)	7
4) The Bengal Florican (<i>houbaropsis bengalensis</i>) (Bengal Bustard)	8
5) Lesser Florican (<i>Syphoetides indicus</i>)	8
6) The Great Indian Bustard (GODAWAN - popular name in Rajasthan)	9
7) Vultures	10
8) The Himalayan Quail (<i>Ophrysia Superciliosa</i>) or Mountain Quail	13
9) Pink Headed Duck (<i>Rhodonessa caryophyllacea</i>)	13
10) Sociable Lapwing (<i>Vanellus gregarius</i>)	13
11) Spoon Billed Sandpiper (<i>Eurynorhynchus pygmeus</i>)	14
12) Siberian Crane (<i>Grus leucogeranus</i>) (also known as Siberian white crane or snow crane)	14
13) Baer's Pochard (<i>Aythya Baeri</i>)	14
5. <i>Endangered Birds</i>	15
1) Winged Wood Duck (called “Deo Hansh” in Assam)	15
2) The Forest Owlet (<i>Heteroglaux blewitti</i>).....	16
6. <i>Hornbills in India</i>	17
A) Various Hornbill species of Northeast India.....	17
B) Great Indian Hornbill	17
C) Hornbills in Western Ghats and A&N.....	18

D) helmeted Hornbill	20
E) Hornbill Festival	20
7. Other Birds in News	21
1) The Great Knot	21
2) Mandarin Duck (<i>Aix galericulata</i>)	22
8. Bird Migration	22
1) Siberian Crane – done earlier	22
2) Greater Flamingo (LC).....	22
3) Lesser Flamingo (NT)	23
4) Jacobin Cuckoo (Pied Cuckoo or Pied Crested Cuckoo).....	23
5) Bar Headed Goose.....	23
6) Warblers	24
7) Amur Falcon	25
8) Other Migratory Birds	26
9. Reptiles: Critically Endangered.....	27
1) Gharial (<i>Gavialis gangeticus</i>)	27
A) Odisha gets its first Gharial Hatchling in 45 years (June 2021)	27
A) Reintroduced Gharials Thriving in Beas River (Dec 2021).....	28
2) Other Crocodile Species of India (non-Critically endangered)	28
A) Mugger Crocodile: (<i>Crocodylus Palustris</i>) (VU).....	28
B) Saltwater Crocodile (<i>Crocodylus Porosus</i>) (IUCN: LC)	29
3) Turtles of India	29
4) CR Reptiles	29
A) Black SOFTshell Turtle (<i>Nilssonia Nigricans</i>).....	29
B) Asian Forest Tortoise (<i>Manuria Emys</i>)	30
C) Hawksbill Sea Turtle (<i>Eretmochelys imbricata</i>)	31
D) Four-toed River Terrapin or River Terrapin (<i>Batagur baska</i>).....	31
E) Red-crowned Roofed Turtle or the Bengal Roof Turtle (<i>Batagur Kachuga</i>)	32
F) LEITH'S SOFTSHELL TURTLE.....	32
G) ASIAN GIANT SOFTSHELL TURTLE (CANTOR'S GIANT SOFTSHELL TURTLE).....	32
H) Sal Forest Tortoise (Elongated Tortoise)	33
10. Reptiles: Endangered Turtles/Tortoises in India.....	34
1) Indian Peakcock Softshell Turtle (<i>Nilssonia Hurum</i>)	34
2) Green Sea Turtle (<i>Chelonia Mydas</i>) [also known as green turtle, black turtle, or Pacific green turtle]	34
3) Assam Roofed Turtle (<i>Pangshura Sylhetensis</i>)	34
11. Reptiles: Vulnerable Turtle/Tortoise in news	35
1) Leatherback Sea Turtle (<i>Dermochelys coriacea</i>).....	35
2) Olive Ridley Sea Turtles (<i>Lepidochelys olivacea</i>)	36

3)	Indian Star Tortoise	37
4)	Other Vulnerable Turtles.....	37
12.	<i>Reptiles: Invasive Turtle in news.....</i>	38
1)	Red Eared Slider TurtleS	38
13.	<i>Reptiles:</i>	39
1)	World Snake Day: 16th July 2023.....	39
2)	Snakes of India	39
a)	The Big Four	39
4)	King Cobra (<i>Ophiophagus hannah</i>)	41
5)	Reticulated Python.....	42
6)	Indian Rat Snake (<i>Ptyas mucosa</i>)/ Oriental Rat Snake / Indian Rat Snake	43
7)	Indian Rock Python	43
1)	Other Vulnerable Snakes.....	43
14.	<i>Reptiles: Geckos, Lizards etc.</i>	45
A)	GeckoS: Critically Endangered	45
A)	Geckos: Endangered: Jeypore Ground Gecko (also called Jeypore Indian Gecko) (<i>Cyrtodactylus jeyporensis</i>)	45
8)	Other Gecko Species	45
A)	Sispara Day Gecko (<i>Cnemaspis Sisporensis</i>) (NT).....	45
B)	Tokay Gecko (<i>Gekko Gecko</i>) (LC)	46

2. REPORT: THE STATE OF INDIA'S BIRDS 2023 (REPORT PUBLISHED IN AUG 2023)

- **About the report:**
 - » It is the **2nd iteration** (first released in 2020) of the report and is an **assessment of the distribution range, trends in abundance and conservation and status of 942 of India's 12,00 bird species** and has been **carried out by 13 partner organizations**, including the WII and Zoological Survey of India.
 - » The report is based on **data from about 30,000 birdwatchers**.
- **The assessment relies on 3 indices:**
 - » Two are related to **change in abundance**.
 - Long term trend (change over 30 years)
 - Current Annual Trend (change over past seven years)
 - » Third is a measure of **distribution range size in India**.
- **Key Highlights:**
 - » **General decline in number of most bird species in the country.**
 - **Raptors, migratory shore birds** and ducks have declined the most.
 - There were **338 species** (out of 942 species studied) for which long term trend has been determined.
 - 60% (204) have declined in long term.
 - 98 species are stable.
 - 36 have increased.
 - For 359 species current annual trends could be determined
 - 142 species or 39% are declining.
 - 64 are in rapid decline.
 - 189 are stable.
 - 27 bird species are increasing.
 - **Specialists** (birds restricted to narrow habitats like wetlands, rainforests and grasslands), as opposed to species that can inhabit a wide range of habitats such as plantations and agricultural fields - **are rapidly declining**.
 - **Generalists** (birds that can live in multiple habitat types are doing well as a group)
 - **Migrants**: Abundance trend of migratory species show that **long-distance migrants**, such as migratory birds from Eurasia or the Arctic, have **declined the most - by more than 50%** - **followed by short distance migrants**.
 - **Birds which are endemic to the Western Ghats** and SriLanka biodiversity hotspots have **rapidly declined** in India over the past few decades.
 - The Great Grey Shrike has shown a **long-term decline of more than 80%**.
 - **Ducks** are also **rapidly declining in India**. India hosts **eight resident** and **35 migratory species**.

- Baer's Pochard, Common Pochard, Andaman Teal have been found to be most vulnerable.
 - **Riverine Sandbar-nesting birds** are also showing a decline due to widespread pressure on rivers from irrigation schemes, transportation, human disturbance, domestic use, and pollution from agriculture and industrial chemicals, variation in the water level and sand mining.
 - **Spoonbill** has declined by more than 50% in the long term and by over 6% annually since 2015.
 - **Sarus Crane** has rapidly declined over the long term and continues to do so.
 - Of the 11 species of woodpeckers for which clear long-term trends could be obtained, seven appear stable, two are declining, and two are in rapid decline.
 - **Yellow crowned woodpecker**, inhabiting widespread thorn and scrub forest, has declined by more than 70% in the past three decades.
 - **Bustards** (Great Indian Bustard, the Lesser Florican, and the Bengal Florican - have been found to be most vulnerable)
- » Several Bird Species like **India Peafowl**, **Rock Pigeon**, **Asian Koel**, and **House Crow** are not only healthy in both abundance and distribution but showing an "increasing trend".
- **Peafowl**, which is the national bird of India, is one of the most rapidly increasing species in the country today. It is expanding into habitats where it has never occurred previously. In last 20 years it has expanded into High Himalayas and Western Ghats. It also appears to be expanding population density in areas where it occurred earlier.
 - **Asian Koel** has shown a rapid increase in abundance of 75%, with an annual current increase of 2.7% per year.
 - **House crow, Rock Pigeon, and Alexandrine Parakeet** has also established new populations in several cities.
- » India is home to 232 endemic species found nowhere in the world.
- Major Threats: See Adjacent image.

THE MAJOR THREATS FACING INDIAN BIRDS

CLIMATE CRISIS

Timings of annual events (e.g. migration, nesting, insect emergence) become asynchronous.

For sedentary birds, dealing with climate change will require rapid adaptive changes.	Higher temperatures also cause birds to alter their behaviour, making them more likely to seek shade and spend less time foraging.
---	--

Bird species are shifting their ranges to higher latitudes (i.e., away from the tropics and towards the poles) and in mountains, to higher elevations.

DISEASE

Nearly 7% of globally threatened bird species have declined due to avian malaria.

Avian influenza outbreaks in 2020–2021 across India, caused mass mortality of wild birds.



ENERGY INFRA

Collision of birds with rotating wind turbine blades; Displacement of birds from the turbine area due to disturbance

URBANISATION

Urban habitats tend to be unsuitable for rare and specialist species, while promoting common species.

In central Delhi, fruiting trees offer resources for arboreal frugivorous birds such as Brown-headed Barbet and Yellow-footed Green Pigeon. But, urbanisation leads to a homogenisation of bird communities due to the increased abundance of birds adept at exploiting ecological niches.

3. REPORT: 75 ENDEMIC BIRDS OF INDIA

- **Why in news?**
 - » Zoological Survey of India (ZSI) have published a title called ***75 Endemic Birds of India***. (Aug 2023)
- **Key Highlights**
 - » India is home to 1,353 bird species, which represent approximately 12.4% of the global bird diversity. Of these, 5% i.e. **78 birds** are **endemic to India**.
 - Of these 3 are CR (Bugun Liocichla; Himalayan Quail; Jerdon's Courser)
- Of these, **3 species have not been recorded in last few decades.**

<p>1 Manipur Bush Quail (<i>Perdicula manipurensis</i>)</p> <ul style="list-style-type: none"> • Listed EN by IUCN • Last recording in 1907 																									
<p>2 Himalayan Quail (<i>Ophrysia superciliosa</i>)</p> <ul style="list-style-type: none"> • Listed as CR by IUCN • Last sighting in 1876 	 <p>Himalayan quail</p> <p>Painting by John Gould based on specimens #1836a and #1836b</p> <table style="margin-top: 10px; border-collapse: collapse;"> <tr> <td colspan="6" style="background-color: #c0e0c0; text-align: center; padding: 2px;">Conservation status</td> </tr> <tr> <td style="text-align: center; padding: 2px;">Extinct</td> <td style="text-align: center; padding: 2px;">Threatened</td> <td style="text-align: center; padding: 2px;">Least Concern</td> <td style="text-align: center; padding: 2px;">CR</td> <td style="text-align: center; padding: 2px;">EN</td> <td style="text-align: center; padding: 2px;">VU</td> </tr> <tr> <td style="text-align: center; padding: 2px;">EX</td> <td style="text-align: center; padding: 2px;">EW</td> <td style="text-align: center; padding: 2px;">NT</td> <td style="text-align: center; padding: 2px;">LC</td> <td colspan="2"></td> </tr> <tr> <td colspan="6" style="text-align: center; padding: 2px;">Critically Endangered (IUCN 3.1)^[1]</td> </tr> </table>	Conservation status						Extinct	Threatened	Least Concern	CR	EN	VU	EX	EW	NT	LC			Critically Endangered (IUCN 3.1) ^[1]					
Conservation status																									
Extinct	Threatened	Least Concern	CR	EN	VU																				
EX	EW	NT	LC																						
Critically Endangered (IUCN 3.1) ^[1]																									
<p>3 Jerdon's Courser (<i>Rhinoptilus bitorquatus</i>)</p> <ul style="list-style-type: none"> • Listed as CR by IUCN • Last confirmed sighting in 2009 																									

- **75 Endemic Birds of India**
 - » They belong to 11 different orders: 31 families and 55 genera.
 - » **Highest number (28) of endemic birds** have been recorded in **Western Ghats**.
 - Interesting species include Malabar Grey Hornbill; Malabar Parakeet; Ashambu Laughing Thrush; and White Bellied Sholakili

» **Andaman and Nicobar Islands** (25 birds) have second highest number of endemic birds.
Interesting species are:

1	<p>Nicobar Megapode: It is a megapode found in some of the Nicobar Islands only.</p> <ul style="list-style-type: none"> Like other megapode relatives, it builds a <u>large mound nest with soil and vegetation</u>, with the eggs produced by the heat produced by decomposition. IUCN: VU 	 <p>Nicobar megapode</p> <p>Conservation status</p> <table border="0"> <tr> <td>Extinct</td> <td>Threatened</td> <td>Least Concern</td> </tr> <tr> <td>EX</td> <td>EW CR EN VU NT LC</td> <td></td> </tr> </table>	Extinct	Threatened	Least Concern	EX	EW CR EN VU NT LC	
Extinct	Threatened	Least Concern						
EX	EW CR EN VU NT LC							
2	<p>Nicobar Serpent Eagle:</p> <ul style="list-style-type: none"> It is <u>probably smallest known eagle</u>, with a weight of about 450 g. IUCN: NT 	 <p>Great Nicobar serpent eagle</p>						
3	<p>Andaman Crake: IUCN status: LC</p>							
4	<p>Andaman Barn Owl: Species endemic to <u>southern Andaman Island</u>.</p>							

- » Eastern Himalayas has 4 endemic species.
- » South deccan plateau and central Indian Forest have one species each

4. CRITICALLY ENDANGERED BIRDS IN INDIA

1) THE JERDON'S COURSER (RHINOPTILUS BITORQUATUS)

It is a nocturnal bird found only in the state of Andhra Pradesh.
It is a flagship species for the extremely threatened scrub jungle.

Was considered extinct till 1986 when it was rediscovered and the area of rediscovery was subsequently declared as the Sri Lankamaleshwara Wildlife Sanctuary in Kadappa district Andhra Pradesh.

Habitat: Undisturbed scrub jungle with open areas.

Distribution: It is a restricted range endemic found locally in **Eastern Ghats of Andhra Pradesh**.

Threats: Clearing of scrub jungle, creation of new pastures, illegal trapping of birds, plantation of exotic trees, quarrying and construction of river canals (Telegu Ganga Canal).



2) BUGUN LIOCICHLA

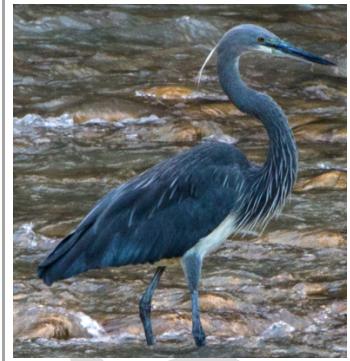
It is a bird species that was first spotted in Arunachal Pradesh, India in 1995. It was described as a new specie after being discovered from in **Eaglenest Wildlife Sanctuary in Arunachal Pradesh**.



3) THE WHITE BELLIED HERON (ARDEA INSIGNIS) (IMPERIAL HERON) (GREAT WHITE-BELLIED HERON)

It is a large heron species. It is mostly dark grey with a white throat and underparts.

Distribution: Foothills of eastern Himalayas in northeastern India and Bhutan to Northern Myanmar. In India, they are found in 5-6 sites of Assam and Arunachal Pradesh.



Habitats: It inhabits undisturbed rivers and wetlands.

Other Characteristics: It is inherently rare, and population has never been known to be very high.

Threats: **Habitat Degradation** (lowland forests and wetlands are being exploited by humans)

4) THE BENGAL FLORICAN (HOUBAROPSIS BENGALENSIS) (BENGAL BUSTARD)

About Bengal Bustard:

- » A very rare bustard species that is very well known for its mating dance.
- » **Habitat:** Grasslands occasionally interspersed with scrublands.
- » **Distribution:** Native to only 3 countries in World: India, Nepal and Cambodia
 - **In India:** Uttar Pradesh, Assam and Arunachal Pradesh.
- » **Threats:** Ongoing conversion of bird's grassland habitat for various purpose including agriculture.



A male Bengal florican

Conservation status



Critically Endangered (IUCN 3.1)^[1]

CITES Appendix I (CITES)^[2]

5) LESSER FLORICAN (SYPHEOTIDES INDICUS)

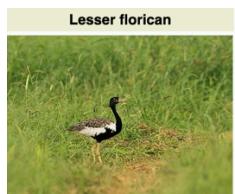
It is the smallest bustard in the world, weighing between 500 g to 700 g, and is found only in India.

It is endemic to Indian sub-continent. According to WII, less than 300 floricans remain in India. This is a sharp drop from 3,500 twenty years ago.

- Dehradun-based WII has also launched a recovery program for the bird.

Distribution

- Historically it was found throughout the country from Gujarat to Bengal and from Rajasthan to Kerala.



Lesser florican

Conservation status



Critically Endangered (IUCN 3.1)^[1]

CITES Appendix II (CITES)^[2]

- Now, the bird is observed in Rajasthan, Madhya Pradesh, Gujarat and some other regions during the monsoon season, when it breeds and later disappear with its chicks to unknown places.
- It is generally found in grasslands and grassland-like habitat, including certain croplands.

Various local names:

- **Kharmore** (meaning grass peacock) **Kakatyā** (referring to the sound the bird produces while courtship displays)/ **Phudakdyā** (referring to jump during the courtship display)

Other features:

- It is best known for male's leaping breeding displays during the monsoons.

Current causes of decline

- **Habitat loss and degradation:** Destruction of grasslands due to excessive cattle grazing, plants of shrubs and trees etc.

6) THE GREAT INDIAN BUSTARD (GODAWAN - POPULAR NAME IN RAJASTHAN)

Physical features:

- A large bird with horizontal body and long legs giving it an ostrich like appearance. It is the largest of the four Bustard Species found in India. The other three are MacQueen's Bustard (VU), lesser Florican and Bengal Florican.
- Among the heaviest of flying birds. It is unmistakable with its black cap contrasting with pale head and neck.

Habitat and Distribution:

- **Historic range** included much of the Indian subcontinent, but it has now shrunken to just 10% of it.
- **Habitats:** GIBs prefer grasslands as their habitat and are considered the flagship bird species of grassland. They also act as barometer of the health of the grassland ecosystem. They are terrestrial birds and thus spend most of their time on ground with occasional flights to go from one part of their habitat to the other.
- Currently, they are found in **India (150 ~ decreasing)** and adjoining region of **Pakistan**. Often found associated in the same habitat as black buck.
- **In Pakistan:** Critically endangered in Pakistan, few birds found in the Cholistan desert.
- **In India** the distribution is as follows:
 - 128 are found in Rajasthan.
 - 10 in Kutch region of Gujarat.
 - Very few in Maharashtra, Karnataka and Andhra Pradesh.



At Naliya grasslands, Kutch, India

Conservation status



- Today, the bustard are restricted to isolated pockets of Rajasthan, MP, Gujarat, MHA, Andhra, and Karnataka.
- Desert National Park, in Rajasthan has a good number of them.
- In fact, Rajasthan has 95% of World's population.

- Protection Status
 - IUCN: CR
 - WPA: Schedule 1
 - CITES: Appendix 1
 - CMS: Appendix 1
- Key threats
 - Hunting - Initially it was a major concern.
 - Loss of Habitat - wastelands are increasingly converted into agri-lands or are being used for renewable energy power projects.
 - Accidents due to high tension electricity cables: Scientists at WII consider it the biggest threat to the GIBs. WII research has concluded that 18 GIBs die every year after colliding with high tension wires.
 - Why?
 - Due to their poor frontal vision, the birds can't spot the power lines from a distance, and are too heavy to change the course.
 - In Kutch and Thar desert a lot of transmission lines have been set up as a number of solar and wind power plants have increased a lot.
- Conservation Efforts
 - It is identified as one of the species under Integrated Development of Wildlife Habitat under MoEF&CC.
 - In 2015, the GoI launched the GIB Species recovery program.
 - Under the program, the WII and Rajasthan Forest department have jointly set up conservation breeding centers where GIB eggs harvested from the wild are incubated artificially and hatchlings raised in controlled environment.
 - In May 2017, Rajasthan government announced setting up of the Great Bustard Breeding Centre at Sorsan in Kota district.
 - Project GIB: Launched by government of Rajasthan with an aim of constructing breeding enclosures for the species and developing infrastructure to reduce human pressure on its habitats.
 - Firefly Diverters:

7) VULTURES

- Significance of Vultures
 - Vulture is nature's most efficient scavenger and halts the spread of bacteria and fungus from dead animals to environment.
 - 4 Species of vultures in India are Critically Endangered.

- » White-backed Vulture / White rumped vulture (*Gyps bengalensis*), Slender Billed Vulture (*Gyps tenuirostris*), and Long - billed Vulture (also known as Indian vulture) (*Gyps indicus*) have declined by 99%.
- » Red headed vulture with a population crash of 91% has also suffered a rapid decline in recent past and is also critically endangered.

White Backed (CR)	Slender Billed (CR)	Long Billed(CR)										
	<p>Slender-billed vulture</p>  <p>Head of <i>Gyps tenuirostris</i></p> <p>Conservation status</p>  <table border="1"> <tr> <td>Extinct</td> <td>Threatened</td> <td>Least Concern</td> </tr> <tr> <td>EX</td> <td>EW</td> <td>CR</td> <td>EN</td> <td>VU</td> <td>NT</td> <td>LC</td> </tr> </table>	Extinct	Threatened	Least Concern	EX	EW	CR	EN	VU	NT	LC	
Extinct	Threatened	Least Concern										
EX	EW	CR	EN	VU	NT	LC						
Red Headed Vulture (CR)	Egyptian Vulture (EN)	Cinerous Vulture (NT), Himalayan (Griffon) Vulture (NT), and Bearded Vulture (NT), Eurasian Griffon (LC)										
<p>Red-headed Vulture</p>  <p>Conservation status</p>  <table border="1"> <tr> <td>Extinct</td> <td>Threatened</td> <td>Least Concern</td> </tr> <tr> <td>EX</td> <td>EW</td> <td>CR</td> <td>EN</td> <td>VU</td> <td>NT</td> <td>LC</td> </tr> </table>	Extinct	Threatened	Least Concern	EX	EW	CR	EN	VU	NT	LC		
Extinct	Threatened	Least Concern										
EX	EW	CR	EN	VU	NT	LC						

- **Habitat:** Forests, villages etc.
- **Distribution:** Across India
- **Why drastic crash in population:**

- » The crash in vulture population came into light in 1990s and the reason was identified in 2004. The cause of **Diclofenac** - a veterinary nonsteroidal anti-inflammatory drug (NSAID) used to treat pain and inflammatory diseases such as gout - in carcasses that vultures would feed on.
 - **Note1:** In 2006, the veterinary use of Diclofenac was banned.
 - **Note2:** In 2015, after GoI placed restrictions on the size of Diclofenac vials for human consumption to just 3 ml, the prevalence of Diclofenac in cattle carcasses was reduced to less than 2% which is safe for vultures.
 - However, unlawful use of Diclofenac is still reported. Similarly, the continued use of vulture toxic drugs, including **Aceclofenac, Ketoprofen, and Nimesulide** in livestock treatment, could pose a major impediment to the re-introduction program.
- » Accumulation of diclofenac in vultures results in gout like symptoms such as neck-dropping, ultimately leading to death.
- » Just 0.4-0.7% of animals carcasses contaminated with diclofenac was sufficient to decimate 99% of vulture populations.
 - **Key Steps:**
 - » **Action Plan for Vulture Conservation 2006**
 - Released by MoEF&CC
 - In 2020, it was extended till 2025.
 - **Ban on the veterinary use of diclofenac** in 2006 by DCGI
 - **The Central Zoo Authority** and **BNHS** have also established the Vulture Conservation Breeding Program
 - It has been successful and had the three CR species (white backed, slender billed, long billed) bred in captivity for the first time.
 - As of Sep 2022, there are 800 odd vultures at eight centres located in **Pinjore, Rani (Assam), Rajabhatkhawa (WB), Hyderabad (Telangana), Bhopal (MP), Junagadh (Gujarat), Ranchi (Jharkhand), and Bhubaneswar (Odisha)**.
 - The Vulture Safe Zone Program is being implemented in eight different places in the country where there were extant population of vultures, including two in Uttar Pradesh.
 - An area is declared Vulture Safe Zone only when no toxic drugs are found in undercover pharmacy and cattle carcass surveys for two consecutive years and the vulture population is stable and not declining.
 - Conservation program for red-headed and Egyptian vultures would also be launched with breeding programs for both.
 - **Other facts for Prelims**
 - **NSAIDS** like aceclofenac, ketoprofen, nimesulide etc. were meant to be alternative to diclofenac. But, detailed studies have found that they may also harm birds and thus BNHS have requested GoI to ban the veterinary use of these drugs.

- Jatayu Conservation and Breeding Centre (JCBC)
 - It is situated at Bir Shikargah WLS in Shivalik ranges of the Himalayan foothills in Haryana's Pinjore.
 - As many as 378 vultures of three species are housed at the Centre, of which 131 are oriental white-backed vultures, 195 are Long billed vultures, and 52 are slender billed vultures.
 - The founder stock of birds at the Centre were collected from various states, including Assam, Rajasthan, Gujarat, Madhya Pradesh and Maharashtra, to maintain genetic diversity.

8) THE HIMALAYAN QUAIL (OPHRYSSIA SUPERCILIOSA) OR MOUNTAIN QUAIL

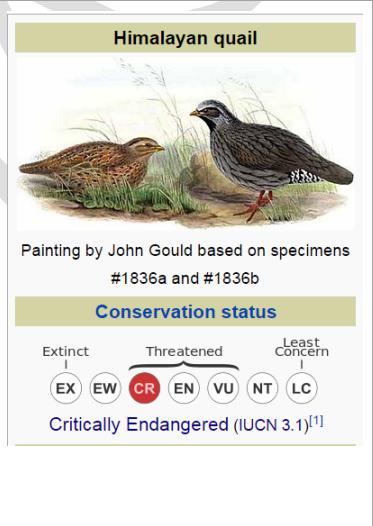
Medium size quail belonging to pheasant family.

Feared Extinct: Last reported in 1876 and is feared extinct. Possible siting of this specie was reported in Nainital in 2003.

Habitat: Tall grass and scrub on the steep hill side.

Distribution: Was known from 2 locations in western Himalayas in Uttarakhand.

Reasons for Extinction: Indiscriminate hunting during colonial period and habitat modification



9) PINK HEADED DUCK (RHODONESSA CARYOPHYLLACEA)

Feared Extinct: Not been conclusively reported since 1949.

Males have a deep pink head and neck from which it derives its name.

Habitat: Overgrown still-water pools, marshes and swamps in lowland forests and tall grasslands

Distribution: Once found in parts of Gangetic plains of India/Bangladesh and in the riverine swamps of Myanmar.

Reason for Extinction/Disappearance : Wetland degradation and loss of habitat.



10) SOCIALE LAPWING (VANELLUS GREGARIOUS)

It's a **winter migrant** to India. It breeds in Kazakhstan and winters in West Asia, Indian Subcontinent, and Sudan.

Habitat: Fallow fields and scrub lands

In India: Habitat distribution is restricted to the north and north west of the country.

Threats: Conversion of **habitat to arable land**, illegal hunting and proximity to human settlements.

Decline: The species has witnessed a sudden and rapid population decline due to which it has been listed as critically endangered



11) SPOON BILLED SANDPIPER (EURYNORHYNCHUS PYGMEUS)

Its breeds on the coast of the **Bering Sea** and winters in South-East Asia.

Habitat: It has a **very specialized breeding habitat**, using only lagoon spits with crow-berry lichen vegetation or dwarf birch and willow sedges, together with adjacent estuary or mud flat habitats that are used as feeding sites by adults during nesting. This becomes a constrain and has always kept its population scarce.

Distribution: Russia, South-East Asia, Indian, Sri Lanka.

In India: Distribution has been recorded in WB, Orissa, Kerala and Tamil Nadu.

Protected area in its breeding, staging and wintering areas include Point Calimere and Chilka Lake

Threats : Habitat degradation and land reclamation. Human disturbance also leads to high incidence of nest desertion.



12) SIBERIAN CRANE (GRUS LEUCOGERANUS) (ALSO KNOWN AS SIBERIAN WHITE CRANE OR SNOW CRANE)

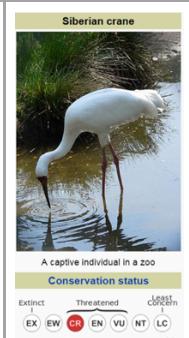
Distribution: Two breeding population in Arctic Tundra of western and Eastern Russia.

Migration: The eastern population migrate during winter to China while the western population winters in Iran and formerly India and Nepal.

Habitat: Wetland areas.

In India: They are known to winter at Keoladeo National Park, Bharatpur, Rajasthan. However, the last documented sighting of the bird was in 2002.

Threats: Pesticide pollution, wetland drainage, development of prime habitat into agricultural fields, and to some extent, hunting



13) BAER'S POCHARD (AYTHYA BAERI)

Details

- It is a medium sized diving duck found in Eastern Asia.
- **It breeds in Southeastern Russia and north-east China. But in winters, it migrates to Southern China, Vietnam, Japan, and India.**
- **Habitats:** These pochards inhabit water with rich aquatic vegetation. They occur in freshwater bodies, rivers, freshwater lakes, reservoirs and coastal habitats surrounded by rich vegetation.
- **In India**, there peak population could be seen in Tinsukia district of Assam. They are also found from **Gir-Himachal-West Bengal**.



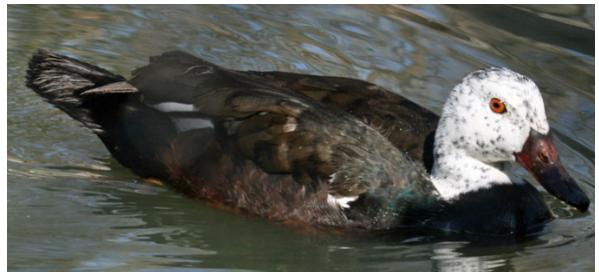
Why critically endangered?

- It is undergoing an extreme rapid population decline, as measured by numbers on both breeding and wintering grounds.
- **Habitat destruction** and overharvesting of both birds and eggs have become the key reason for this decline.

5. ENDANGERED BIRDS

1) WINGED WOOD DUCK (CALLED “DEO HANSH” IN ASSAM)

It is a bird which can be heard, but rarely seen. It has a dark body contrasting with a whitish head and neck. It is a crepuscular bird as it is most active at dusk and dawn. The adults are largely omnivorous.



Distribution: It mostly resides in dense tropical evergreen forests and is known to prefer inaccessible swampy areas formed by rivers, lakes etc.

- There was a time when the duck was extensively found in Assam and Arunachal Pradesh while also being sighted in Meghalaya, Manipur and Nagaland. Further it was also found in South East Asia.
- **Currently**, its population is limited only to certain pockets of Assam and Arunachal Pradesh and Myanmar and Bangladesh.

- **IUCN status: EN**
- In 2003, it was declared Assam's state bird.

- Project Deo Hanh -

- Launched in 2018, it aims to develop a long-term conservation strategy to revive population of the bird.
 - It is also focused on initiating a conservation breeding program to supplement the wild population if suitable habitat of these birds are found.
- It is being implemented by the Assam Forest Department (AFD) and Wildlife Trust of India (WTI) with support from Oil and Natural Gas Limited (ONGC).

- Threats: Habitat loss:** Encroachment, deforestation and anthropogenic pressure. Reserve forests like Kakojan, Kukurmara, Kundil Kalia, Sadiya Station and Kotha in Eastern Assam, which were once suitable habitat for the ducks, are now heavily degraded.

2) THE FOREST OWLET (HETEROGLAUX BLEWITTI)

- Rediscovery:** After 113 years in 1997.
- Habitat:** Dry deciduous forests
- Distribution:** Southern MP, Northwest, and North Central Maharashtra.
 - Recently, the specie has been located in a number of new locations, so its status has changed from CR to EN.
- Threat:** Logging operations, burning, and cutting of trees damage roosting and nesting trees of the forest owlets



6. HORNBILLS IN INDIA

- India has **9 Hornbill species**:
- Hornbills are known as forest engineers or 'farmers of forests'. As large fruit eating bird, they play a vital role in dispersing the seeds of about 80 rainforest trees.
- Hornbills indicate the prosperity and balance of the forest they build nest in.
- **Key threat:**
 - **Habitat loss**: A recent study using satellite imagery data flagged high rate of deforestation in Papum forest reserve (RF) adjoining the Pakke Tiger Reserve (which is a major hornbill habitat in Arunachal Pradesh) as well as the adjoining parts of Assam.
 - In the past, hornbills were hunted for casques - upper beak and feathers for adorning headgear despite being cultural symbols of some ethnic group in the northeast, specifically the Nyishi of Arunachal Pradesh. But a 20-year-old conservation program entailing the use of fiber-glass beaks defused the threat to the birds to a large extent.

A) VARIOUS HORNBILL SPECIES OF NORTHEAST INDIA

1. Great Indian Hornbill (VU)
2. Wreathed Hornbill (VU)
3. Oriental Pied Hornbill (VU)
4. Rufous Necked Hornbill (VU)
[Arunachal Pradesh, Assam, WB]
5. Austen's Brown Hornbill
(Brown Hornbill, or White throated Hornbill)
(*Anorrhinus austeni*) (NT)
[almost throughout India, except dry NW region and heavy rainfall area of south-western ghats]



B) GREAT INDIAN HORNBILL

The great hornbill also known as the Indian hornbill or great pied hornbill. It is the largest hornbill species in India. It is long lived, living for nearly 50 years in captivity.

It's impressive size and color have made it important in many tribal cultures and rituals.

It is predominantly frugivorous but is an opportunist and will prey on small mammals, reptiles and birds.

Most prominent feature

Bright yellow and black casque on top of its massive bills.

The casque is hollow and serves no purpose.

Distribution and habitat

Great hornbills are found in forests of India, Bhutan, Nepal, Mainland SEA, Indonesian Island of Sumatra and North Eastern Region of India.

State birds of

Kerala and Arunachal Pradesh



Conservation Status

IUCN: VU

CITES: Listed in Appendix 1 of CITES

Key threats

Tribal peoples threaten the great Indian hornbill by hunting it for its various parts

The beaks and heads are used in charms and the flesh is believed to be medicinal.

Tribes in North-eastern India and Borneo use the feathers for head-dresses, and the skulls often wore for decoration.

Habitat loss - deforestation

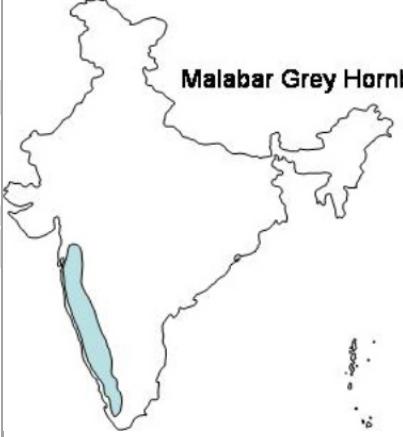
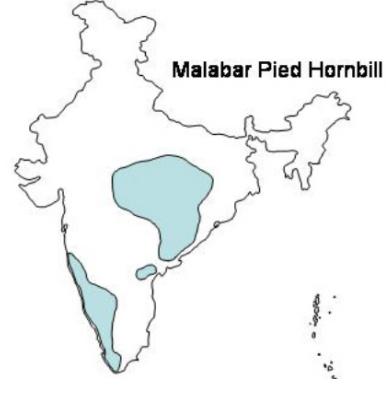
C) HORNBILLS IN WESTERN GHATS AND A&N

- Four Hornbill species are found in Western ghats: Great Indian Hornbill (widely distributed), Indian Grey Hornbill, the Malabar Grey Hornbill and Malabar Pied Hornbill;

Great Indian Hornbill (VU)

Discussed in detail above



<p>Indian Grey Hornbill (LC) <u>(Endemic to India)</u></p>	<p>It is a <u>common hornbill found on the Indian subcontinent</u>. It is <u>mostly arboreal</u> and are <u>commonly sighted in pairs</u>.</p> <p>It has <u>grey feathers all over the body</u> with a light grey or dull light white belly.</p> <p>Distribution: <u>Plains</u> (From the foothills of Himalayas southwards; bounded in west by Indus system and bounded to the east by the Ganges Delta) Note: <u>Not found in NE India, dry western regions and very wet western ghats southern part.</u></p>	 <p style="text-align: right;">Indian Grey Hornbill</p>
<p>Malabar Grey Hornbill (VU) <u>(Endemic to Western Ghats)</u></p>	<p>It is a hornbill <u>endemic to Western Ghats</u> and is associated with the hills of South India. They have a <u>large beak</u> but lack the <u>casque that is prominent in some hornbill species</u>.</p> <p>They are found in dense forests and around <u>rubber, arecanut and coffee plantation</u>.</p> <p>It is known for its loud 'laugh' that echoes in the Western Ghats</p>	 <p style="text-align: right;">Malabar Grey Hornbill</p>
<p>Malabar Pied Hornbill (NT) <u>(Endemic to India and Sri Lanka)</u></p>	<p>It is also known as <u>lesser pied hornbill</u>.</p> <p>Distribution: It is <u>distributed across three main regions</u> within the Indian sub-continent: <u>Central and Eastern India, Western Ghats, and in Sri Lanka</u>.</p> <p>Its habitat is <u>evergreen and moist deciduous forests</u>, often near human settlements.</p>	 <p style="text-align: right;">Malabar Pied Hornbill</p>

Narcondam Hornbill (VU)
(Endemic to the Narcondam island of Andamans)

Note: India also has one species that has one of the smallest ranges of any hornbill: the Narcondam Hornbill, found only on the island of Narcondam (In the Andamans)

Distribution: It is endemic to Indian island of Narcondam in the Andamans. It has the smallest home range of all the Asian hornbills.



D) HELMETED HORNBILL

The helmeted hornbill is a very large bird of hornbill family. It is found in Malaysian Peninsula, Sumatra, and Borneo. The casque (helmet like structure on the head) accounts for 11% of its 3 kg weight.

- The poachers are not interested in their brilliant plumage or large bills, but the helmet like block of reddish-gold keratin at the front of the skulls known casque.

In the past few years, a surge in the demand for hornbill ivory has pushed the avian species to the brink.

The product has become very popular in China and wealthy collectors are keen to show off their status by acquiring rare or unusual animals, that it is fetching up to five times the price of elephant tusk on black market.

The casque (soft, ivory-like substance that's carved by craftsmen in China into luxury ornaments, statues, and jewellery) has soared in value as so-called red ivory.



Helmeted hornbill

immature male

Conservation status



E) HORNBILL FESTIVAL

- » The Hornbill festival is an annual festival celebrated from 1st - 10th December in the North-eastern Indian State of **Nagaland**.
- » It represents all ethnic groups of Nagaland for which it is also called the **Festival of Festivals**.
- » **Reason behind the festival:**
 - The state of Nagaland has several ethnic groups, which have their own distinct festivals. More than 60% of the population of Nagaland depends on agriculture and therefore most of their festivals revolve around agriculture.

- To encourage inter-ethnic interaction and to promote cultural heritage of Nagaland, the Government of Nagaland organizes the Hornbill Festival every year in the first week of December. The first was held in Dec 2020.

» **Who organizes the festival:**

- The festival is organized by Department of Tourism and Department of Art & Culture and showcases melange of cultural displays under one roof.

» **Venue:**

- The main venue of the hornbill festival is held at the Kisama Heritage Village located in the Southern Angami region of Kohima District which is about 12 km from Kohima.

7. OTHER BIRDS IN NEWS

1) THE GREAT KNOT

- **Details about Great Knot**

- The great knot (*Calidris tenuirostris*) is a small wader.
- Their breeding habitat is tundra in north-east Siberia (and in small numbers in Western Alaska).
- They are strongly migratory wintering on coasts in southern Asia through to Australia.



- **Recent sighting in India**

- Around 1000 birds were tagged with MOSKVA rings in the Kamchatka peninsula in eastern Russia.
 - One of them has been seen in Kerala's coast on the Chavakkad beach in Thrissur district. It came calling in a flock of 14 great knots and many other migratory birds.
 - The engraving on the bird's ring provided a vital clue of its Russian connections.
- This migratory bird traversed Central Asian Flyway and is only one of the two great knots (other has been sighted in Jamnagar Gujarat) to be re-sighted in India among the early thousand ones tagged with MOSKVA rings in Kamchatka peninsula.
- These long-distance migrants stay at the Yellow Sea region and Thailand in southeast Asia before proceeding to their southerly winter grounds including Peninsular India along the CAF.
- The migratory route suggested that the bird that flew to Thrissur travelled over 9,000 kms.
- Another bird, that was tagged 6Z has been sighted at Jamnagar for the past consecutive years.



The migratory path of the Great Knot

2) MANDARIN DUCK (*AIX GALERICULATA*)

- **Details:**
 - » It is considered the most beautiful duck in the world. It has majestic colors and can be spotted from a distance. It is a perching duck species native to East Asia including Russia, China, Japan.
 - » Over the years, population has also been established in Europe and USA.
- **IUCN status:** LC

Spotting in Assam (Feb 2021)

- In Feb 2021, the bird was seen in the **Maguri-Motapung beel** (or wetland) in Assam's Tinsukia. In Tinsukia it was last seen in Dibrugarh River in 1902.
 - More recently it was sighted in Manipur's Loktak lake in 2013, and in Saatvojni Beel in Manas National Park and Tiger Reserve in Assam's Baksa district 2014.
- It's a migratory bird that breeds in Russia, Korea, Japan and north-eastern parts of China. But it rarely visits India as it doesn't fall in its usual migratory route.



8. BIRD MIGRATION

WORLD MIGRATORY BIRD DAY (WMBD)

- The day is celebrated bi-annually on the second Saturday of May and October.
- It is an awareness raising campaign highlighting the need for conservation of migratory birds and their habitats.
 - It aims to draw attention to the threats faced by migratory birds, their habitats etc.

1) SIBERIAN CRANE – DONE EARLIER

2) GREATER FLAMINGO (LC)

- It is the most widespread and largest species of flamingo family in the world. It is found in Africa, Southern Europe, Middle East, and Indian Subcontinent.
- They generally reside in mudflats and shallow coastal lagoons with saltwater.
- Indian subcontinent is the largest breeding ground for Greater flamingo and lesser flamingo coming to India in winter season.



- Greater Flamingoes migrate to freshwater and estuarine habitats across **Maharashtra, Andhra Pradesh, Telangana, Rajasthan and some other states.**
- Around Mumbai it can be seen in Sewri Mudflats, Thane Creek and the Talawe Wetlands.

3) LESSER FLAMINGO (NT)

- These are the smallest species of Flamingo.
- They occur in sub-Saharan Africa and north-western India.
- Most lesser Flamingoes in India feed in and around Mumbai's mudflats.



4) JACOBIN CUCKOO (PIED CUCKOO OR PIED CRESTED CUCKOO)

- **Details**
 - It is a member of the cuckoo order of birds that is found in **Africa and Asia.**
 - In **India**, they are partially migratory.
 - The pied cuckoos that come to Himalayan foothills are believed to migrate from Africa.
 - It is one of the few species of migratory birds in India that come in Summer. Most migratory species come in winter from colder places like Mongolia, Siberia, Northeastern China, Kazakhstan etc.
 - They are considered harbinger of Monsoon in India. Farmers in India have relied on the arrival of pied cuckoo as a signal to sow seeds, as they know that Monsoon will be soon upon them. This signal is never wrong as the pied cuckoo arrives in India **riding the monsoon wind.**
 - The community of pied cuckoos in southern India are resident birds and not migratory.
 - The species is a **brood parasite** and in India the host is mainly species of babblers in the genus Turdoides. The color of the eggs matches those of the host, typically turquoise blue.
 - **IUCN: LC**



5) BAR HEADED GOOSE

- Bar headed geese are found in **Central China and Mongolia** and they breed there. They are generally found in high altitude lakes where the bird grazes on short grass.
- During winters, they **migrate to Indian Subcontinent** and stay here till the end of the season.
 - It can be clearly distinguished from any other grey geese because of the **black bars** on its head.
- **Known for High Altitude Fly:**
 - They are one of the birds which can fly even at high altitudes. They come to India and return to their homes by **crossing the Himalayan ranges**. This is **one of the most high-altitude migrations in the world**. Their ability to sustain the high oxygen demands of flight in air that is exceedingly oxygen-thin is exceptional. This ability of bar-headed geese differentiates them from other similar lowland waterfowl.
- **Large folks visit** the Koothanakulam Bird Sanctuary in TN. But they are rarely seen in Kerala.
- **IUCN Status:** LC



6) WARBLERS

- **Note: Warblers**
 - Various Passeriformes (perching birds) are commonly referred to as warblers.
 - They are not necessarily closely related to one another, but **share some characteristics**, such as being **fairly small, vocal, and insectivorous**.

Lesser White Throat:

It is a migratory bird which **comes from Europe to India around October-November** every year.

It hunts insects while flitting from branch to branch. Its feeding behavior is slightly different from other Warblers: it also forages on the ground for insects and grubs.

In Delhi NCR, the bird is common throughout the city, especially in birding hotspots (Sultanpur Sanctuary outskirts, Okhla Bird Sanctuary) and areas with old dense forests.



Willow Warbler

Willow Warbler (*Phylloscopus trochilus*), one of the longest migratory small birds that breeds throughout the northern and temperate Europe and the Palearctic, has been sighted for the first time in the country **at Punchakkari** in Thiruvananthapuram (Nov 2020)

Willow warbler



Other Warbler birds which migrate to India

Greenish Warbler



Hume's Warbler



7) AMUR FALCON

- About Amur Falcon

- » It is a small raptor (25 cm long) of falcon family which breeds in Siberia, Mongolia and North China. It winters several thousands of the bird migrates to India and across the Indian Ocean to South Africa. This bird has one of the longest migration routes of all birds, doing up to 22,000 km in a year.
- » It is also known as eastern red foot falcon.
- » In Manipur, the birds are locally known as Akhuaiyuina.
- » **Physical characteristics**
 - It shows dimorphism. Male has a sooty grey back while the female is paler and has scaly marks.



Female

Conservation status

Extinct	Threatened	Least Concern
EX	EW	CR
EN	VU	NT
LC		

» They are **wholly insectivorous** thus helping agriculture of the region.

- **Conservation Efforts:**

- » In 2012, thousands of Amur Falcons were killed in Nagaland.
- » But efforts including nature education, conservation awareness and community engagement to connect with nature ensured not a single killing in 2013, 14, 15, and 16.
- » With the hunters turning into protector, **Nagaland's Pangti Village has become the falcon capital of the world**.
 - In April 2018, '**The Pangti Story**' was adjudged the Best Environment Film at the 65th National Film festival.
- » Thanks to Amur Falcon, Nagaland is also listed as among the 10 best birding destinations in the world by National Geographic.

8) OTHER MIGRATORY BIRDS

- A. Common Teal/ Eurasian Teal (LC)
- B. Yellow Wagtail
- C. White Wagtail
- D. Northern Shovler
- E. Rosy Pelican
- F. Wood Sandpiper
- G. Spotted Sandpiper
- H. Eurasian Wigeon
- I. Black tailed goodwit
- J. Spotted Redshank
- K. Starling
- L. Blue throat
- M. Asian Koel
- N. Black crowned Night Heron
- O. Eurasian Golden Oriole
- P. Comb Duck
- Q. Blue Cheeked Bea Eater
- R. Blue Tailed Bea Eater
- S. Cuckoos

- **Reasons for Migration**

1. To avoid adverse factors (extreme climatic condition)
2. To manage food shortage
3. To manage water shortage
4. To have better breeding conditions
5. Less competition for safe nesting places

9. REPTILES: CRITICALLY ENDANGERED

1) GHARIAL (GAVIALIS GANGETICUS)

- One of the longest of all living crocodilians, uniquely evolved as specialized, river dwelling, fish eater. With 110 sharp interdigitated teeth in its long thin snout, it is well adapted to catching fish, its main diet.
- **Habitat:** They inhabit foremost flowing rivers with high sand bank which they use for basking and building nests.
- **Distribution**
 - » **Past:** Once inhabited all the major river system from the Irrawaddy River in the east to the Indus river in the west.
 - » **Now**
 - Only viable population in National Chambal Sanctuary (also known as National Chambal Gharial Wildlife Sanctuary), spread across three states of UP, Rajasthan and Madhya Pradesh.
 - **Recent Conservation** efforts have led to breeding of gharial after 45 years in Odisha in 2021 in Mahanadi River near Satkosia range.
 - » With the introduction of Gharial in 1975, Odisha has become the **only state with all the three species** - Freshwater Gharials, Muggers, and Saltwater Crocodile
 - **Small non-breeding population:** Exist in son, Gandak, Hoogly and Ghagra rivers.
 - **Extinct** in Myanmar, Pakistan, Bhutan and Bangladesh.
- **Threats**
 - » The combined effects of dams, barrages, artificial embankments, change in river course, pollution, sand mining, riparian agriculture and ingress of domestic and feral livestock.



A) ODISHA GETS ITS FIRST GHARIAL HATCHLING IN 45 YEARS (JUNE 2021)

- For the first time since they were introduced in the rivers back in 1975, **Odisha have seen natural nesting of Gharials**.
 - The journey for conservation of Indian Gharials (*Gavialis gangeticus*) started in 1975 at Gharial Research and Conservation Unit (GRACU), Tikarpada, and adjoining Satkosia Gorge Sanctuary along the Mahanadi river in Odisha.



- All the original Gharials introduced in Odisha over the years are dead now. In the past three years, Odisha had introduced 13 more gharials in the Mahanadi. Only eight survived.
- As many as 28 hatchlings were spotted towards the end of May in Mahanadi river, in the Baladamara area near Satkosia range.
- **Note:**
 - With the introduction of Gharial in 1975, Odisha has become the **only state with all the three species** - Freshwater Gharials, Muggers, and Saltwater Crocodile.
- Gharials are different from Muggers and don't harm humans. But, many people mistake them for crocodiles and consider them harmful.

A) REINTRODUCED GHARIALS THRIVING IN BEAS RIVER (DEC 2021)

- Since 2017, 94 gharials have been released in the Beas Conservation Reserve and there have been only two casualties.
- These Gharials are healthy and have adapted to the Beas Conservation Reserve as their home. They have dispersed both upstream and downstream of the release site and can be spotted any time depending on the water levels and season, indicating that the first step of their rehabilitation has been successful.
- **Experts believe that they may start breeding in the next few years** as the released gharials are healthy and have adapted to the Beas Conservation Reserve as their home.
 - » Natural breeding would be the real success. The eldest of the reintroduced gharials is 7 years old now and experts are hopeful that breeding would start in next three years (Gharial start breeding at the age of 10).
- **Background:**
 - » Gharials were commonly seen in Beas River till the 1960s after which it became extinct.
 - **Why?** Change in hydrology due to dam construction, rapid-land use change of flood plains and rampant overfishing led slowly into the extinction of the gharial from the Beas

2) OTHER CROCODILE SPECIES OF INDIA (NON-CRITICALLY ENDANGERED)

A) MUGGER CROCODILE: (*CROCODYLUS PALUSTRIS*) (VU)

- Mugger Crocodile, also called marsh crocodile, broad-snouted crocodile is a crocodilian native to freshwater habitat from Southern Iran, Pakistan, India and Sri Lanka. It is already extinct in Bhutan and Myanmar.
- Sex of the hatchlings depends on the temperature during incubation.
- In India it is distributed throughout the country From Rajasthan to Odisha and from Punjab to Tamil Nadu.
- **Protection Status**
 - IUCN: VU
 - WPA: Schedule 1



Mugger 'high'-walking in National Chambal Sanctuary, India

B) SALTWATER CROCODILE (CROCODYLUS POROSUS) (IUCN: LC)

- Details

- It is a saltwater crocodile native to Saltwater habitats and brackish wetlands from India's East Coast across South East Asia and the Sundaic region to northern Australia and Micronesia.
- These are the **largest living reptiles** and thus also the largest crocodilian species known.
 - **Males** can grow upto 6 meters with more than **1,000 kg** of weight.
 - **Females** are much smaller and rarely surpass 3 m.
- It is an opportunistic hypercarnivores apex predator. It's also very dangerous for humans if they venture into its occupied areas.
 - Their population has been growing a lot in A&N islands and therefore the UT administration has been requesting Central government to delist it from WPA-Schedule-1
- **Distribution in India:**
 - The saltwater crocodile is found in eastern states of WB, Odisha, AP and TN. It is also found in A&N Islands.



- Protection:

- **IUNC: LC**
- **WPA: Schedule-1**

3) TURTLES OF INDIA

- India has 29 species of turtles
 - » **Freshwater Turtles** (25)
 - » **Tortoises** (5)
- The main difference between turtles and tortoises is that turtles are primarily aquatic whereas tortoise are terrestrial and spend more time on land.
- More than half of the turtle species in India are threatened and half of them are protected under WPA-Schedule-1.

4) CR REPTILES

A) BLACK SOFTSHELL TURTLE (NILSSONIA NIGRICANS)

About Black Soft Shell Turtle

- It is rarest of India's turtle species.

Recent efforts for preservation

- Hayagriva Madhab Temple at Hajo (30 km from Guwahati) released 16 black soft shell turtle, in the Haduk Beel (wetland) of Pobitora WLS. These turtles were bred in the temple's pond.
- Other softshell turtles species moved from the temple pond to the wild was Indian Softshell Turtle and peacock softshell Hatchlings



B) ASIAN FOREST TORTOISE (MANURIA EMYS)

- Why in news?

- Ten captive bred Asian Giant Tortoise (*Manouria emys*) juveniles were released into a protected area of Nagaland (Dec 2022)

Asian Forest Tortoise (commonly known as the **Mountain Tortoise**) is the largest tortoise species in the mainland Asia. It is endemic to North-eastern India, Bangladesh and Southeast Asia.

Habitation: Hilly wet forests.

IUCN: CR

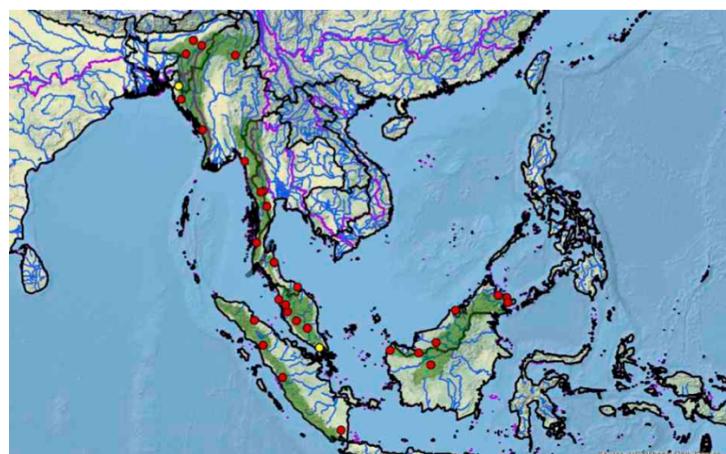
Other interesting features:

- These are the only Tortoise which lay eggs above ground in a nest, which is constructed out of leaf litter by females.

Threats: Over-exploitation and unsustainable use for consumption by local communities resulted in species being pushed to the brink of extinction.

Soft Release in Nagaland Protected areas:

- The Nagaland Forest Department and non-profits Turtle Survival Alliance and Wildlife Conservation Society, India conducted a soft release of juvenile tortoise with an objective to rewild the species and population recovery.



- » The animals were conserved and bred for five years at the Nagaland Zoological Park, Dimapur before their release.
- » **Soft Release** is a process of gradually releasing captively bred species into the wild. This allows the species to develop comfort with the surrounding and other released individuals

Distribution: India, Bangladesh, Myanmar, Thailand, Singapore etc.

C) HAWKSBILL SEA TURTLE (ERETMOCHELYS IMBRICATA)

- **Distribution:** Have a wide range, found predominantly in tropical reefs of the Indian, Pacific and Atlantic Oceans. Found in more than 70 countries.
 - In India: Andaman and Nicobar Islands, the coast of Orissa and Tamil Nadu.
- **Habitat:** Nesting occurs in insular sandy beaches.
- **Threats**
 - Turtle shell trade (for decorative purposes), egg collection, slaughter for meat, oil pollution and destruction of nesting and foraging habitats.



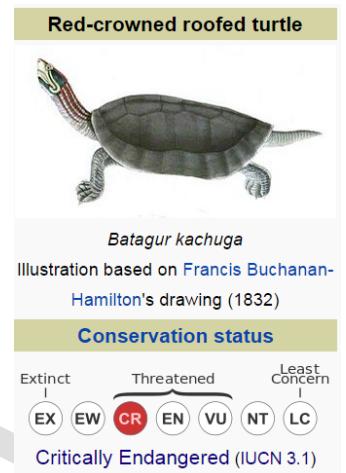
D) FOUR-TOED RIVER TERRAPIN OR RIVER TERRAPIN (BATAGUR BASKA)

- Species of riverine turtle
- **Diet:** Omnivorous diet makes them an essential part of the efficient clean-up systems of aquatic habitats.
- **Habitat:** Fresh water rivers and lakes.
- **Distribution:** Found only in Bangladesh, Parts of India (WB and Orissa), Myanmar and Cambodia .
 - It is presumed extinct in several south-eastern Asian countries.
Even in WB and Orissa, it is difficult to find in wild.
 - It is considered world's second most endangered turtle. The Yangtze giant soft shell turtle, *Rafetus swinhoei*, is considered the most endangered fresh water turtle.
- **Protection Status**
 - IUCN: CR
 - WPA: Scheduled 1
- **Threats:** Use of flesh for medicinal purposes, demand for eggs, which are considered a delicacy.
- **Note**
 - There are six large fresh water turtle of the genus Batagur, three are found in India.
 - » Batagur kachuga (Red-crowned roofed turtle) and Batagur dhongoka (three-striped roofed turtle) are found in tributaries of the Ganga, such as Chambal.
 - » The **Northern river terrapin** is the most endangered of the three species.



E) RED-CROWNED ROOFED TURTLE OR THE BENGAL ROOF TURTLE (BATAGUR KACHUGA)

- Critically endangered turtle, endemic to South Asia.
- Males have bright red coloration during the breeding season.
- **Habitat:** Deep flowing rivers but with terrestrial nest sites.
- **Distribution:** Found in **India, Bangladesh, and Nepal.**
 - In India it resides basically in watersheds of Ganga. **The National Chambal Sanctuary** is believed to be one of the last viable habitats for the species.
- **Threats:** Water development projects, water pollution, human disturbance and poaching for illegal wildlife market.



F) LEITH'S SOFTSHELL TURTLE

IUCN: CR

CITES: Appendix-1

It mainly inhabits rivers and reservoirs mainly in southern peninsular India, in states like Odisha, Madhya Pradesh, Karnataka, Andhra Pradesh, Kerala, Maharashtra, and Tamil Nadu. Its presence is substantial in the Cauvery, Tungabhadra, Ghatprabha, Bhavani, Godavari, and Moyar Drainages.

The specific name, *leithii*, is in the honor of Andrew H. Leith, a physician with the Bombay Sanitary Commission.

Threats: Loss of habitat, pollution, and unchecked urbanization.



G) ASIAN GIANT SOFTSHELL TURTLE (CANTOR'S GIANT SOFTSHELL TURTLE)

IUCN: CR

CITES: Appendix-II

It's a freshwater turtle that is native to Southeast Asia. It is considered among the largest extant freshwater turtles.

Distribution: Cantor's giant softshell turtles occur in eastern and southern India, Bangladesh, and throughout southeast Asia and Papua New Guinea.



They spend most of their life buried and motionless with only their eyes and mouth protruding from the sand. They surface only twice a day to take a breath and capture their prey by sit-and-wait strategy.

Key threats: Habitat destruction, harvesting for meat, and accidental killing by getting trapped in fishing gears.

In Kerala they are also called '**Pala poovan**' - since its nose and white bony belly plate resemble the shape and color of the pala flower, a type of crape jasmine.

H) SAL FOREST TORTOISE (ELONGATED TORTOISE)

- Details

- It is a species of tortoise found in Southeast Asia and parts of the Indian subcontinent.
 - » In India, it is found in Assam, Bihar, Jharkhand, Meghalaya, Mizoram, Odisha, Sikkim, Tripura, Uttarakhand, UP and West Bengal.
- It is called elongated as its shell is considerably depressed, more than twice as long as deep, with flat vertebrate region;
- This species is **dimorphic**.



- Protection Status

- IUCN: CR
- CITES: Appendix-II
- WPA: Schedule-IV

10. REPTILES: ENDANGERED TURTLES/TORTOISES IN INDIA

1) INDIAN PEAKCOCK SOFTSHELL TURTLE (NILSSONIA HURUM)

- Distribution and Habitat

- **Distribution:** It is found throughout the Indus, Ganga and Brahmaputra basins of Pakistan, India, Nepal and Bangladesh.
- **Habitat and Ecology:** Wetlands (inland), Artificial/Aquatic & Marine.



- Major threats

- Habitat degradation
- **Illegal trade** - It is in demand in both domestic and international (east Asian) food markets and can occasionally be found as individuals in domestic pet trade.

- Conservation Status:

- IUCN: EN
- WPA: Schedule-1
- CITES: Appendix-1

2) GREEN SEA TURTLE (CHELONIA MYDAS) [ALSO KNOWN AS GREEN TURTLE, BLACK TURTLE, OR PACIFIC GREEN TURTLE]

- Details

- Its common name refers to the green fat found beneath its carapace, not to the color of its carapace, which is olive to black.
- They are herbivorous and consume sea grass, algae etc.



- Habitat and Distribution

- They extend throughout tropical and subtropical oceans worldwide.
- **In India**, it occurs in East coast, West Coast, Lakshadweep, and Andaman & Nicobar Islands.
 - » In MHA, they are often spotted by locals

- Conservation Status

- IUCN: EN
- CITES: Appendix-1
- WPA: Schedule-1

3) ASSAM ROOFED TURTLE (PANGSHURA SYLHETENSIS)

- **Details**
 - It is a species of turtle found in Brahmaputra-Meghna draining in India (Assam) and parts of Eastern Bangladesh.

- **Habitat and Distribution**
 - **Habitat:** It has specialized habitat requirements for clear flowing streams
 - **Distribution:** It is known to be distributed in **north-east India**.

- **Conservation Status:**
 - IUCN Endangered
 - CITES: Appendix II
 - WPA: Schedule-1



11. REPTILES: VULNERABLE TURTLE/TORTOISE IN NEWS

1) LEATHERBACK SEA TURTLE (DERMOCHELYS CORIACEA)

IUCN: VU

WPA: Schedule-1

It is the largest of all living turtles and the heaviest non-crocodilian reptile.

- They can weigh as much as 900 kgs.

It is the only species in the genus *Dermochelys* and family *Dermochelyidae*.

It can easily be differentiated from other modern sea turtles by its lack of a bony shell. Instead, its carapace, is covered by skin and oil flesh.

Diet: **Jelly fish** is their primary food. Important top predators in marine environment.

Habitat: tropical and subtropical oceans

Threats

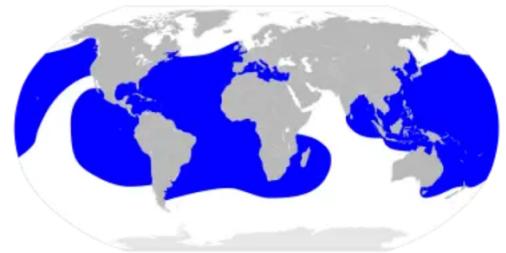
- High sea fishing operations, harvesting of eggs, destruction of nests by wild predators and domesticated species such as cats, dogs and pigs.
- Artificial lighting, disorient hatchlings and adults and cause them to migrate inland rather than towards the sea.



Distribution:

They are found in all oceans (tropical and temperate waters) **except the Arctic and Antarctic.**

- In Asia, they nest only in Indonesia, Sri Lanka and the Andaman and Nicobar Islands.
- In India the population is restricted to Great and Little Nicobar Islands.



- **Threats to habitats** : Construction, mining and plantation of exotics.

2) OLIVE RIDLEY SEA TURTLES (*LEPIDOCHELYS OLIVACEA*)

- Introduction

- Olive Ridley Sea turtle, also known as the Pacific Ridley Sea Turtle, is a medium sized species of turtle found in warm and tropical waters, primarily in the pacific and Indian Oceans. It is the **most abundant** of all sea turtles in the world.
- **Conservation status**
 - The Olive Ridley turtle is classified as Vulnerable according to IUCN and listed in Appendix 1 of CITES.
 - The turtles are also protected under the Wildlife (Protection) Act (Schedule 1 - Part II).

- Specialty

- These species along with their cousin the Kemps Ridley turtle (CR) are known for their unique mass nesting called Arribada, where thousands of females come together on the same beach to lay eggs.

- Where are they found in India?

- i. **Gahirmatha Beach** in the Kendrapada district of Odisha, which is also part of Bhitarkanika Wildlife sanctuary, is the largest breeding grounds for these turtles.
 - Gahirmatha Marine Wildlife Sanctuary, which bounds the Bhitarkanika WLS to the east, was created in 1997. it extends from Dhamra River mouth in the north to Brahmani river mouth in the south.
 - It is known as world's largest Olive Ridley rookery, the animals come here in lakhs for mating and laying eggs.
 - Mass nesting in the Gahirmatha marine sanctuary occurred from March 9-23, 2021 and over 3 lakh eggs were laid during this period.

- ii. **Other mass nesting beaches in Odisha**

- Beaches at the mouth of rivers Rushikulya and Devi.
 - The Rushikulya river mouth is considered the second-biggest rookery in India after Gahirmatha.
- Oliver Ridley turtles stayed away from Rushikulya in Odisha in 2021. But experts said that it was a natural phenomenon and is not unusual.

- Other parts of the world

- Coast of Orissa is the largest mass nesting site for Olive Ridley turtles followed by coast of Mexico and Coast of Costa Rica.

3) INDIAN STAR TORTOISE

- It is a threatened species of tortoise found in **dry and scrub forests in India, Pakistan and Sri Lanka**.
- They are distributed from India (except lower Bengal), extending west to Sindh Province and Sri Lanka.
- **Protection Status**
 - IUCN: VU
 - WPA: **Schedule IV**
 - CITES: Appendix 1 (updated in 2019 from appendix 2 to Appendix-1)



- **Key threats**
 - Species popularity in the **exotic pet trade** makes it vulnerable. It is one of the most trafficked tortoise species in the world owing to the unique star like radiating pattern on the shell.

4) OTHER VULNERABLE TURTLES

Black Spotted Turtle (*Geoclemys hamiltoni*)/ Spotted Pond Turtle/ Indian Pond Turtle

- It is a medium size freshwater turtle which is endemic to South Asia. It is mainly black with small yellowish spots and a much-elevated carapace.
- The species is distributed across the North, Northeast and a few parts of Central India in states of Meghalaya, Assam, West Bengal, Bihar, UP, UK, Haryana, Punjab, Rajasthan, MP etc.
- Earlier hunted for meat, is now more sought after as an exotic pet.

Black pond turtle



Conservation status



Vulnerable (IUCN 2.3)^[1]

Aldabra Giant Tortoise

Why in news?

- Seychelles has gifted India a pair of giant Aldabra Tortoise in a good will gesture and as a symbol of ever-lasting friendship.

Intro

- The Aldabra giant tortoise, from the island of the Aldabra atoll in the Seychelles. It is one of the largest tortoise in the world.
- In past, it was found on many of the western Indian Ocean Islands, as well as Madagascar

Threat Status: VU in IUCN Red list

Protection Status: It is listed in CITES appendix II.

Aldabra giant tortoise



Conservation status



Vulnerable (IUCN 3.1)^[1]

Indian Soft-Shell Turtle (*Nilssonia gangetica*), or Ganges Soft Shell Turtle

Intro: It is a species of soft-shell turtle found in South Asia in rivers such as the Ganges, Indus and Mahanadi.

Protection and Conservation Status

- IUCN Red List: Vulnerable
- Listed in Schedule 1 of the Wildlife Protection Act, 1972

Main Dangers

- Its meat is considered a delicacy in parts of TN and hence is traded illegally.

Indian softshell turtle



Immature (the dark eyespots on the carapace are indistinct or absent in adults)^[1]

Conservation status



12. REPTILES: INVASIVE TURTLE IN NEWS

1) RED EARED SLIDER TURTLES

- It derives its name from the red stripes around the part where its ears would be and from its ability to slide quickly off any surface into the water.
- It is native to USA and northern Mexico and is an extremely popular pet due to its small size, easy maintenance, and relatively low cost.



- They **grow fast** and leave virtually nothing for the native species to eat. Thus, it is also an [invasive species](#). In India it has already affected states such as [Karnataka and Gujarat](#).
- It is threatening to invade the [natural water bodies across the North-east](#), home to [21 of the 29 vulnerable native Indian species of freshwater turtles and tortoises](#).
- A recent study by a team of herpetologists have found [red eared slider](#) in the [Deepor Beel Wildlife Sanctuary](#) and the [Ugratara temple pond](#) - both in Guwahati. Another study has found [red-eared slider from an unnamed stream](#), connected to Tlwang river, on a farm near Mizoram capital Aizawl.
- Preventing its invasion of Brahmaputra** and other river systems of northeast is [especially important](#) because the north-east is home to 72% of the turtle and tortoise species in the country.
- Note:** It is **traded legally**, but perhaps the [time has come for the government to come up with regulations against keeping invasive as pets](#).

13. REPTILES:

1) WORLD SNAKE DAY: 16TH JULY 2023

- **History:**
- World Snake Day is an [annual event celebrated on July 16th to raise awareness](#) about the importance of snakes and to dispel some of the myths and fears that surround them.
- It was [first celebrated in 2006](#) by the Snakebite Survivors Network (SSN) and the [International Society of Herpetologists \(ISU\)](#).
- **National Zoological Park, New Delhi** has celebrated World Snake Day on 16th July 2023.

2) SNAKES OF INDIA

- Snakes have been [slithering on earth](#) for more than a 100 **million** years. These creatures have [evolved from lizards](#)
- Globally, [more than 34,00 species](#) of snakes have been identified. India, is [home to 350 species of snakes](#). **This** number is increasing constantly as a result of new discoveries. [But only 15% of these are venomous](#).

A) THE BIG FOUR

- The four venomous snake species responsible for causing the [greatest number of medically significant human snake bite cases](#) on Indian subcontinent are sometimes collectively referred to as the **Big Four**.
- They Include the following snakes:

Russel's Viper: Daboia russelii:

It is native to Indian subcontinent. They are mainly nocturnal.

Their hiss is amongst the loudest hiss of the snakes in the country.

IUCN Status: LC

They are responsible for more than 40% of snake bites in India.



Common Krait (Bungarus caeruleus):

It is a nocturnal snake and thus most of the human encounters happen at night.

IUCN: Not Evaluated

They are responsible for around 18% of snake bites in India.



Indian Cobra (Naja Naja):

Indian Cobra is a species of the genus Naja found in India, Pakistan, Bangladesh, Sri Lanka, Nepal and Bhutan. It is also known as the spectacled Cobra, Asian Cobra, or binocellate Cobra.

Conservation Status:

- It is not a threatened species and is not listed in IUCN Red List.
- It is listed under Appendix II of CITES because it closely resembles other species that are threatened and in need of protection.



About Genome Sequencing

A large international team of researchers affiliated with corporate and academic institutions has sequenced the genome of the Indian Cobra. They have published their paper in the journal Nature.

Genetics. The group describes their goal to develop an anti-venom.

Need: Every year around 5 million people around the world are bitten by Venomous snake - around 1 lakh lose their lives. Four snakes - the common Krait, the Russell's Viper, the saw scaled Viper and the Indian Cobra do the most harm. Further, scientists have been unsuccessful in developing anti-venom against these snakes so far.

With gene sequencing scientists are hoping that it would be lead to development of an antivenom based on synthetic recombinant venom built from protein.

Indian Saw Scaled Viper (Echis Carinatus):

It is a venomous viper species found in West Asia, Central Asia and South Asia.

It is the smallest member of the big four snake that are responsible for causing the most snakebite cases and deaths, due to various factors including their frequent occurrence in highly populated region, and their inconspicuous nature.

IUCN: Note Evaluated



4) KING COBRA (OPHIOPHAGUS HANNAH)

- It is one of the most venomous snakes in the world. They can reach upto 18 feet in length, making them longest of all venomous snakes.

- **Habitation and Distribution**

- King Cobra lives mainly in the rain forests and plains in India, southern China and South East Asia. They are comfortable in a variety of habitats, including forests, bamboo thickets, mangrove swamps, high altitude grasslands, and in rivers.



- In India, they are known from **Odisha and Jharkhand**. Recently (Aug 2022), it has been confirmed that their habitat has expanded to Central India (Chhattisgarh) as well.
- **Food:**
 - They are carnivores and it other snakes, lizards, eggs, and small mammals.
- **Other special features**
 - They are the only snakes in the world that build nests for their eggs, which they guard ferociously until the hatchlings emerge.
 - It is best known as the species of choice for the snake charmers of South Asia. Though, they can hear, they are actually deaf to ambient noises, sensing ground vibrations instead.
 - **Snake charming** is “often a sad con game in which an exhausted cobra is put on the defensive, yet conditioned (with pain) not to strike the flutist,” Smithsonian’s National Zoo says
- **Protection Status:** They face a variety of threats stemming from human activities, these snakes are vulnerable to extinction.
 - **IUCN Status: VU**
 - **CITES: Appendix-II**
 - **WPA: Schedule-II**
- **Note:** It is different from **Indian Cobra (Naja naja)** which is not a threatened species.
- **Increase in sightings in Human Settlement** in Odisha
 - Disturbances caused by forest fires and other human activities may cause the king cobras to come to their natural habitats in the forests to human habitats.
 - The dwindling population of prey in forests could be other reason.

Sightings of King Cobra in Chhattisgarh for the first time (Aug 2022)

- **31 nesting spots of King Cobras** have been confirmed in the Korba forest range.
- **Note:** Earlier, there was no known evidence of the longest venomous snake in Chhattisgarh or all of central India before this.
- King Cobras require a continuous forest patch. Their presence indicates that the habitat is performing better in terms of ecosystem services.

5) RETICULATED PYTHON

It is the longest snake (third heaviest) in the world regularly reaching 6.25 m in length. The longest reticulated python ever recorded was 10 metres.



It is a non-venomous snake.

IUCN: LC (wide distribution)

Distribution: Native to South and South-east Asia

Habitat: Rainforests, woodlands, grasslands.

6) INDIAN RAT SNAKE (PTYAS MUCOSA)/ ORIENTAL RAT SNAKE / INDIAN RAT SNAKE

It is a common non-venomous species of Columbidae family found in south and Southeast Asia. In northern India they are also called **Dhamans**.

They are famous for their crawling speed and large size. They are a farmer's friend, as they help control the rodent population from destroying crops.

They are favorite meals of King Cobra.



7) INDIAN ROCK PYTHON

It is one of the heaviest and longest snakes found in India.



Despite being common in most part of the country it is difficult to see them in the wild as they are nocturnal and arboreal snakes. They have a thermal sensing pit on their jaws.

1) OTHER VULNERABLE SNAKES

Burmese Rock Python (*Python bivittatus*)

- Note1: It is found in **SE Asia, Southern China, and North-Eastern Indian region.**
- Note2: It is an invasive species in Southeastern United States and it reached there as a result of pet trade.
- <https://youtu.be/9CddEyqqaKk>

**Andaman Krait (*Bungarus andamanensis*)**

- It is a species of venomous snake found in Andaman Islands only.

**Walnut Kukri Snake (*Oligodon juglandifer*)**

- It is found in N-E India mostly in Darjeeling hills and Sikkim. It inhabits montane grasslands and lowland and montane moist forests.



14. REPTILES: GECKOS, LIZARDS ETC.

A) GECKOS: CRITICALLY ENDANGERED

ANAIKATTI GECKO

- Distribution

- Anaikatti hills (near Coimbatore)



A) GECKOS: ENDANGERED: JEYPORE GROUND GECKO (ALSO CALLED JEYPORE INDIAN GECKO) (*CYRTODACTYLUS JEYPORENSIS*)

- Why in news?

- Rare Jeypore Ground Gecko listed in Appendix 2 of CITES to stall its trafficking (Nov 2022)

IUCN: EN

CITES: Appendix-II

WPA: Not included yet.

It was first discovered in 1877, from Jeypore forests of recent day-Odisha.



It was considered extinct before its rediscovery in 2010 in eastern ghats of Odisha.

Distribution: the lizard inhabit semi-evergreen forests in high elevation areas of eastern ghats of Southern Odisha and northern Andhra Pradesh.

Illegal trade - Species look handsome and docile making it a good candidate for pet trade. It is popular among breeders in and outside India.

8) OTHER GECKO SPECIES

A) SISPORA DAY GECKO (CNEMASPIS SISPARENsis) (NT)

- It's a large gecko which dwells usually in Forests, it is largely insectivorous and nocturnal.
- **Habitat / Distribution:** Endemic to western Ghats, and found in Sispara, Nilgiris, Kavalai near Cochin.
- **Threats:** Habitat conversion and modification.



B) TOKAY GECKO (GEKKO GECKO) (LC)

- Introduction

- It is a nocturnal arboreal gecko in the genus Gekko, the true geckos. It is **native to Asia and some pacific island countries**.
- **Distribution:** The species occur in northeast India, Bhutan, Nepal, and Bangladesh, throughout Southeast Asia, including Phillipines and Indonesia and to western New Guinea in Melanesia.



▫ Features

- Tokay geckos are the second largest geckos in the world today.
- Distinctive in appearance, and known for its loud mating call, Tokay is about 11-20 inches in length weighing 150-400 gms.

▫ Conservation Status

- **IUCN: LC**
- **Wildlife Protection Act of India:** Included in Scheduled III as highly endangered animal.
- **CITES:** Appendix - 2

▫ Threats

- **Poaching for medicinal trades** in parts of Asia.
 - Ingredient in traditional Chinese medicine t
 - Dried up body part is reportedly used as aphrodisiac.
 - Highly sought after in China, Hong Kong, Taiwan, Vietnam, Malaysia, Singapore and other parts of Asia
- **Kept as pet**

High profile advanced research